

Oracle® Database Navigator

User's Guide



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Contents

Preface

Audience	i
Related Documents	i
Conventions	i

Changes in this Release for Oracle Database Navigator User's Guide

1 Introduction to Oracle® Database Navigator

Installation of Oracle® Database Navigator Plug-in	1
Installing Oracle® Database Navigator Plug-in from Disk	2
Installing Oracle® Database Navigator Plug-in from JetBrains Marketplace	2

2 Database Connection Management

Supported Databases	1
Creating Database Connections	3
Creating Database Connections using OCI Toolkit Plug-in	4
Database Configuration	6
Database Authentication	7
Connection Details	10
Connection Properties	11
Driver Management	12

3 Environment Types

Configuration of Database Environments	1
Creating Environment Types	4
Assigning Environment Types to Database Connections	4

4 Session Browser

Session Browser Settings	1

	Viewing Database Sessions	2
	Database Session Operations	5
5	Transaction Management	
	Transaction Handling	1
	Resource Monitor	3
	Session Management	4
	Creating Database Sessions	6
6	Workspace Integration	
	DDL File Management	1
	DDL File Extraction	2
	File Connection Mapping	3
	Creating File Connection Mappings	4
7	Database Browser	
	Introduction to DB Browser Window	1
	Database Views	3
	Database Objects	4
	Creating Global Filters for Data Objects	8
	Default Editor Views for Object Types	9
	Operations on Database Objects	11
	Events Monitor	13
	Enabling Notification for Data Change	15
8	Data Viewers and Editors	
	Data Editor Settings	1
	Data Grid Settings	3
	Data Viewers	4
	Table Editors	6
	Creating Filters in Table Editors	8
	Viewing Database Records	10
	Editing Database Records	11
	Exporting Database Records	12
	Text Editors	14
	Editing Data in Basic Text Editor	14
	Editing Data in Qualified Text Editor	16

9

Code Editors

Configuration of Code Editors	1
Code Editor Features	2
SQL Editor	5
Creating New SQL Consoles	7
Editing SQL Script Files	10
DDL File Editor	12
Creating DDL Files	13
Disassociating DDL Files	15
Program Editor	17
Comparing Code Changes with Original/Database Version	21
Conflict Resolution of Code Versions	22
Java Editor	23

10

Execution Engine

Working with Execution Engine	1
Database Execution Console	2
Executing Statements	3
Executing Scripts	6
Creating Command Line Interfaces for Script Execution	8
Executing Methods	10
Method Execution History	13
Executing Java Programs	13
Java Execution History	18
Creating Java Execution Wrappers	19
Project Code Base Synchronization	23

11

Debugging Engine

Introduction to Debugging Engine	1
Debugger Engine Types	1
Debugger Engine Configuration for Database Connections	2
Debugging Methods	5
Debugging Java Programs	8
Debug Operations for PL/SQL and Java Programs	12

12

Database Assistant

Oracle Select AI	4
Creating Credentials for Oracle Select AI	5
Creating AI Profiles for Oracle Select AI	7

Working with Select AI	16
Public LLMs	21
Creating Credentials for Public LLMs	22
Creating AI Profiles for Public LLMs	27
Working with Public LLMs	34
Tool Approvals and Tool Data	40

13 Vector Embeddings

Vector Toolbox	1
Generating Vector Embeddings	4
Vector Database Tables	19
Vector Data Type Support	22

A Third-Party License Information

Preface

This preface introduces you to the Oracle® Database Navigator User's Guide discussing the intended audience, structure, and conventions of this document. A list of related Oracle documents is also provided.

- [Audience](#)
- [Related Documents](#)
- [Conventions](#)

Audience

The *Oracle® Database Navigator User's Guide* is intended for programmers, Java developers, database administrators and others interested in developing Java-based or PL/SQL-based applications.

To use this document, you must be familiar with

- Java
- Oracle PL/SQL
- Oracle databases

Related Documents

For more information, see these Oracle resources:

- *Oracle Database Concepts*
- *Oracle Database JDBC Developer's Guide*
- *Oracle Database PL/SQL Packages and Types Reference*
- *Oracle Database Java Developer's Guide*

You can also find useful information on the following page:

[Getting Started with Select AI](#)

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

Convention	Meaning
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Changes in this Release for *Oracle Database Navigator User's Guide*

This section contains the new features in this book for Release 3.7.0.

New Features

This section lists the new features included in this release:

Database Assistant

- Support for Public LLMs.
See [Public LLMs](#)
- Support for OCI Generative AI.
See
[Creating Credentials for Oracle Select AI](#)
[Creating Credentials for Public LLMs](#)

Database Connectivity

- Azure Authentication
See [Azure authentication for database connections](#)

OJVM Support extended to

- Java Debugger
See [Java Debugger](#)
- SSH Reverse Tunnel for debug engine
See [SSH Reverse Tunnel debug engine implementation](#)
- Java Execution with Array parameters
See [Java execution of programs with array data type](#)

Data Change Notifications (DCN)

- Enabling DCN Listeners on datasets
See [Data Change Notifications](#)
- Monitoring Registration and Events
See [Monitoring listener registrations and events](#)

Vector Embeddings

- Generating Vector Embeddings
See [Vector Toolbox](#)

1

Introduction to Oracle® Database Navigator

This chapter introduces the Oracle® Database Navigator plug-in for various IDEs.

The Oracle® Database Navigator plug-in is a comprehensive open-source database management tool that can be used with various IDE platforms. It includes advanced capabilities for data visualization, SQL development, enhanced security, and administrative tools. This plug-in is tailored for advanced database users handling complex data environments and provides an intuitive interface for database management, development, and analysis. It offers features such as database browser (for multiple connections), an in-built SQL/PLSQL editor, an execution engine to code, run, compile SQL statements and Java programs, a debug engine, along with extensive administrative capabilities, tools for data visualization, coding database objects, schema migration, and monitoring DB connection sessions among others.

Topics:

- [Installation of Oracle® Database Navigator Plug-in](#)
This topic provides installation information about Oracle® Database Navigator plug-in.

Installation of Oracle® Database Navigator Plug-in

This topic provides installation information about Oracle® Database Navigator plug-in.

Oracle® Database Navigator plug-in can be installed on various IDE platforms. Some of the IDE platforms that are compatible with this plug-in are as follows:

- IntelliJ IDEA (Ultimate and Community edition)
- Android Studio
- AppCode
- Aqua
- CLion
- DataSpell
- GoLand
- MPS
- PhpStorm
- PyCharm
- Rider
- RubyMine
- RustRover
- WebStorm

For the ease of explanation, this user guide explains the installation procedure specifically for the IntelliJ IDEA platform interface. However, the installation of the Oracle® Database Navigator plug-in in all the other IDE tools follow the same steps.

Note

The platform interface can vary with different versions of the IDE tools.

- [Installing Oracle® Database Navigator Plug-in from Disk](#)
This topic describes the procedure to install Oracle® Database Navigator using the plug-in archive file.
- [Installing Oracle® Database Navigator Plug-in from JetBrains Marketplace](#)
This topic describes procedure to install Oracle® Database Navigator Plug-in directly from the JetBrains Marketplace website.

Installing Oracle® Database Navigator Plug-in from Disk

This topic describes the procedure to install Oracle® Database Navigator using the plug-in archive file.

1. Download the latest version of the Database Navigator plug-in archive file (.ZIP) from the following location: <https://plugins.jetbrains.com/plugin/1800-database-navigator/versions/stable>

The plug-in is downloaded as a DBN-<version#>.zip folder (for example, DBN-3.6.1.0.zip) on your local workstation.
2. Open IntelliJ IDEA and click the **Settings** (gear) icon to access the **IDE and Project Settings** menu options. Alternatively, press **Ctrl+Alt+S** to directly open the **Settings** page.
3. From the **Settings** menu, select **Plugins** to open the **Plugins** settings window.
4. From the **Plugins** settings menu options select **Install Plugin from Disk**.

The **Choose Plugin File** window opens for you to select the archive file downloaded and saved in your local workstation.
5. Select the archive .ZIP folder and click **Open**.
6. Click **OK** on the **Plugins** settings window of the IntelliJ IDEA platform to start the installation process.

Once the plug-in is successfully installed, the Oracle® Database Navigator plug-in gets listed on the **Installed** tab of the **Plugins** settings window.
7. Select **Database Navigator** from the list of **Installed** plug-ins tab to view its details such as a product overview, "what's new" information for the latest release, and even user reviews on a separate pane.
8. Click **Restart IDE** when prompted.

Oracle® Database Navigator Plug-in is successfully installed in IntelliJ IDEA.

Installing Oracle® Database Navigator Plug-in from JetBrains Marketplace

This topic describes procedure to install Oracle® Database Navigator Plug-in directly from the JetBrains Marketplace website.

1. Open IntelliJ IDEA and click the **Settings** (gear) icon to access the **IDE and Project Settings** menu. Alternatively, press **Ctrl+Alt+S** to directly open the platform **Settings** page.

2. From the **Settings** menu options, select **Plugins** to open the **Plugins** settings.
3. Select the **Marketplace** tab and type "Database Navigator" in the search bar.
The Database Navigator plug-in displays in the list of search results.
4. Click **Install** on the Database Navigator plug-in to start the installation process.
Once the plug-in is successfully installed, the Oracle® Database Navigator plug-in gets listed on the **Installed** tab of IntelliJ IDEA **Plugins** settings window.
5. Select **Database Navigator** from the list of **Installed** plugins tab to view its details, such as a product overview, "what's new" information for the latest release and user reviews on a separate pane.
6. Click **Restart IDE** when prompted.
The Oracle® Database Navigator plug-in is successfully installed in IntelliJ IDEA.

2

Database Connection Management

This chapter provides an overview of managing database connections.

Oracle Database Navigator tool provides ability to configure multiple database connections at the project level. You can perform the following as part of managing database connections:

- Create new connections for various databases
- View database connection states
- Edit connections
- Disconnect from database and delete connections
- Configure driver settings to establish connection
- Change user credentials
- View connection session details in the session browser
- Enable database logging
- Configure debug engine
- Select database objects to view in the connection and add filters to the objects

Topics:

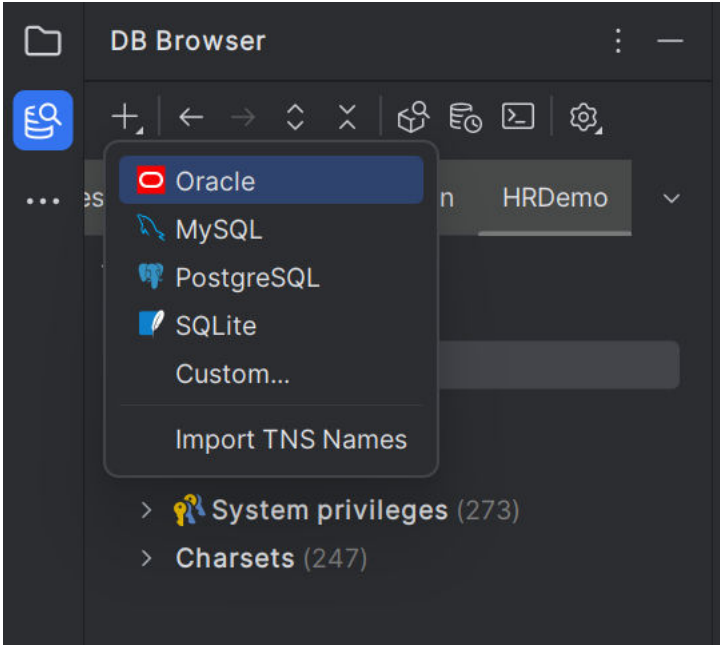
- [Supported Databases](#)
This topic provides an overview on the types of databases supported by the plug-in.
- [Creating Database Connections](#)
This topic describes the procedure to create a new database connection in Oracle® Database Navigator.
- [Database Configuration](#)
This topic provides an overview of the type of database configuration.
- [Driver Management](#)
This topic provides an overview of driver packages supported by the plug-in.

Supported Databases

This topic provides an overview on the types of databases supported by the plug-in.

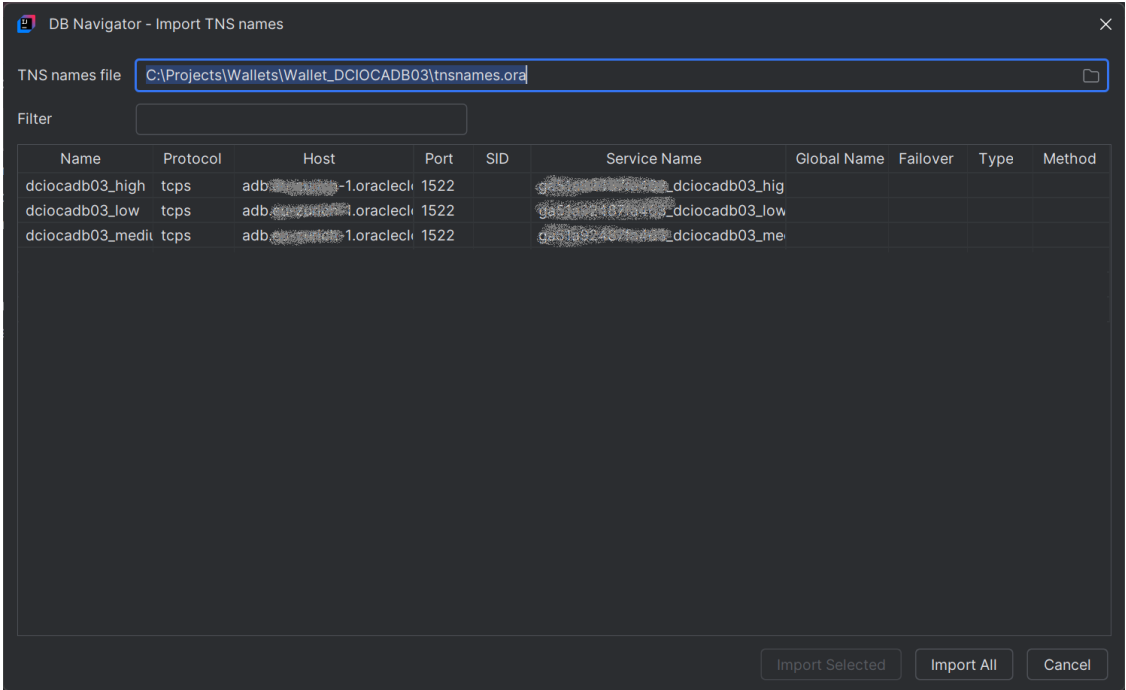
The following databases are supported by Oracle® Database Navigator plug-in to establish a connection:

- Oracle database
- MySQL
- PostgreSQL
- SQLite
- Any custom JDBC compliant database (experimental)



Apart from the database types listed above, custom JDBC compliant databases (experimental) are also supported by the plug-in.

The **Import TNS Names** option allows you to import and configure connections from existing *tnsnames.ora* config files. On selecting this option, you can access any existing *tnsnames.ora* file or wallet that will list all available connection profiles. You can choose the profile you want to import and connect.



Creating Database Connections

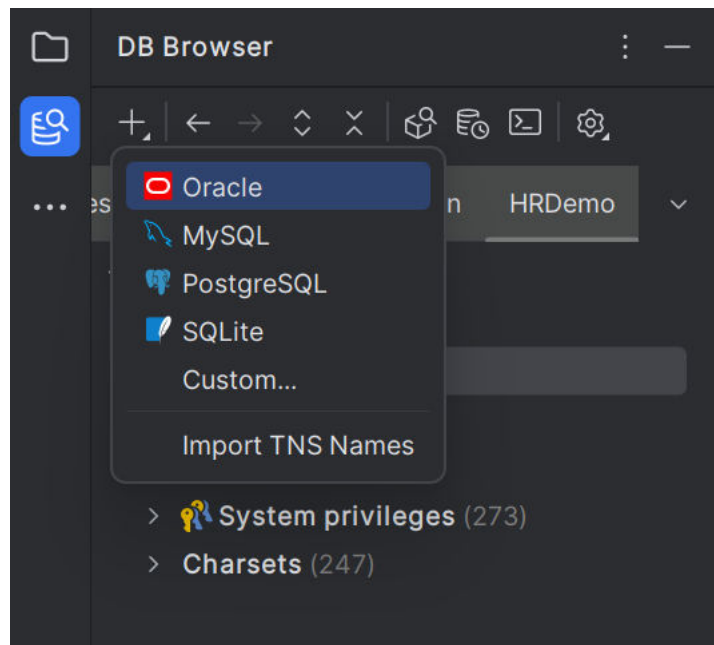
This topic describes the procedure to create a new database connection in Oracle® Database Navigator.

1. From the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Database Browser** option to open the **DB Browser** window.

Note

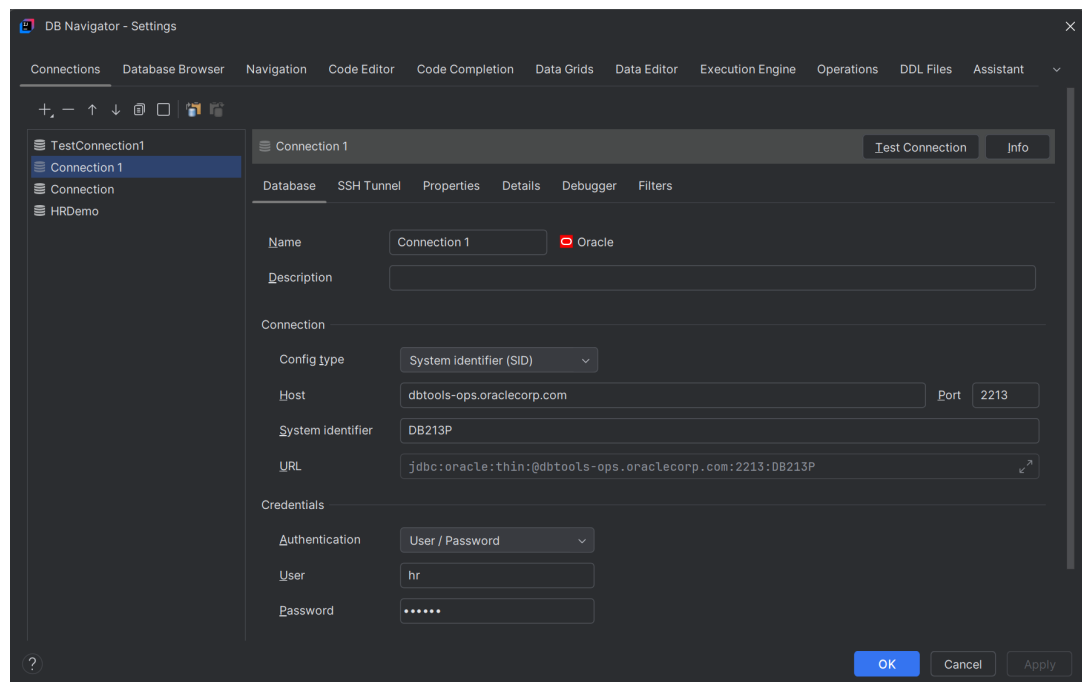
If the **DB Browser** icon displays on the side bar of your IDE platform, click the icon to directly open the **DB Browser** window pane.

2. Click the **New Connection** icon on the DB Browser window and select the type of database connection you want to create.



The **DB Navigator - Settings > Connections > Database** tab opens to create a new DB connection.

Alternatively, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Connections** tab to open the wizard for creating a new database connection.



3. Enter the connection details in the **Database** tab and click **Test Connection** to verify that the connection to the database is successful.
 4. Click **OK** to create the new connection.
- The new database connection is displayed in the DB Browser pane with its data structure.
- [Creating Database Connections using OCI Toolkit Plug-in](#)
This topic describes the procedure to create OCI based database connections through OCI Toolkit Plug-in.

Creating Database Connections using OCI Toolkit Plug-in

This topic describes the procedure to create OCI based database connections through OCI Toolkit Plug-in.

The integration of OCI Toolkit plug-in (an Oracle open-source tool), with Oracle Database Navigator allows you to create new OCI based database connections. The OCI Toolkit plug-in is provided for various IDEs to enhance developer productivity when managing Oracle Cloud Infrastructure (OCI) autonomous databases. For Oracle Cloud Infrastructure database connections, default authentication is done via Oracle wallets, (over Mutual TLS authentication process) using digital certificates. The OCI database configuration file corresponding to a profile contains the user credentials, tenancy information, and token information for the Oracle Cloud autonomous connections.

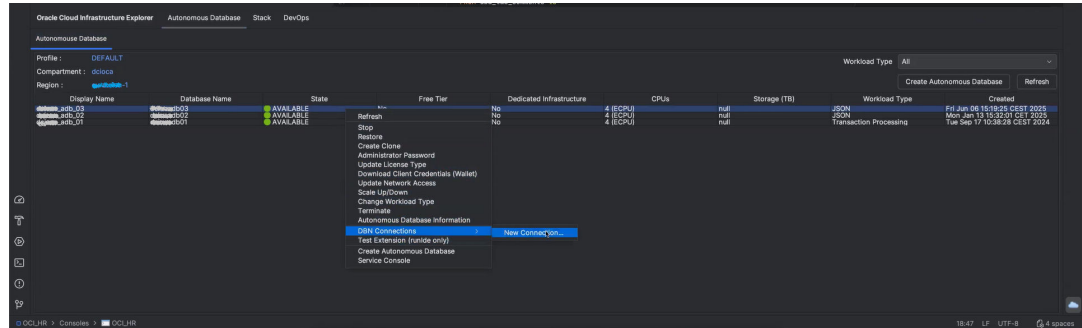
Note

The integration of these two plug-ins is available for Oracle Database Navigator version 3.6.0 and later and Oracle OCI Toolkit version 1.2.0 and later.

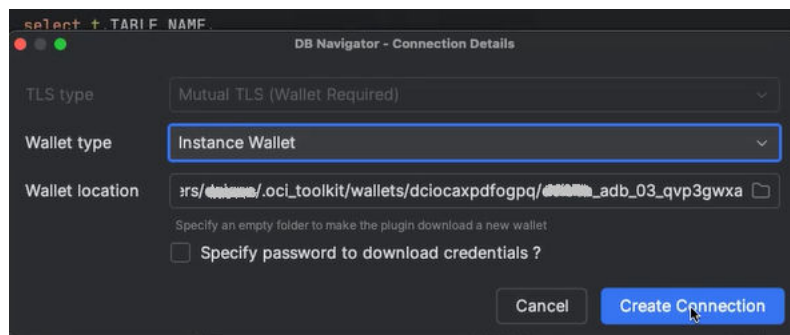
If you have the OCI Toolkit plug-in installed in your IDE, then click the corresponding icon to open the **Oracle Cloud Infrastructure Explorer** window. The **Autonomous Databases** tab

opens, by default, listing all existing autonomous database connections. To create a new OCI database connection:

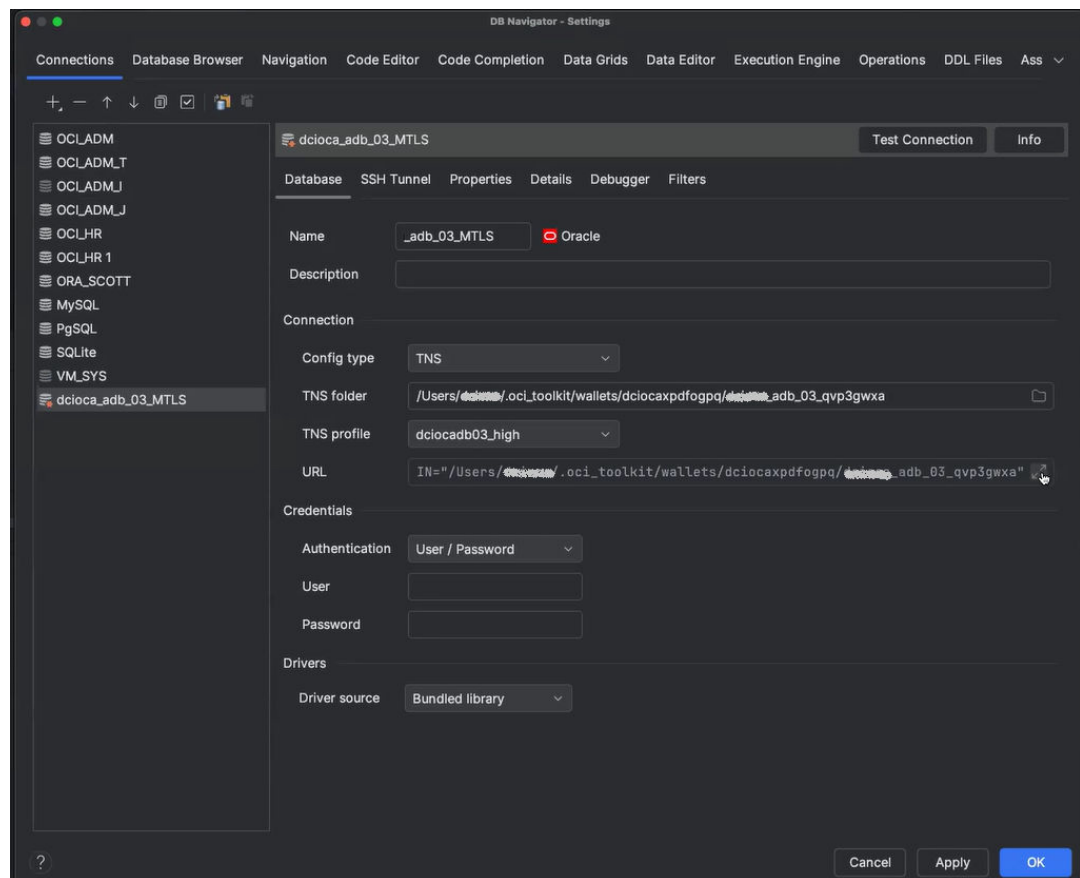
1. Right-click on any of the rows displaying the database connection in the **Autonomous Databases** tab and select **DBN Connections > New Connection**. The **DB Navigator - Connection Details** dialog box is displayed.



2. Enter the **Oracle Wallet** name and upload the wallet.



3. Click **Create Connection**. After the wallet is successfully downloaded, the new database connection details are displayed in the **Connection** tab of the **DB Navigator - Settings** window.



4. Click **OK** to create the new OCI database connection.

The new OCI database connection is displayed in the DB Browser pane with its data structure.

Database Configuration

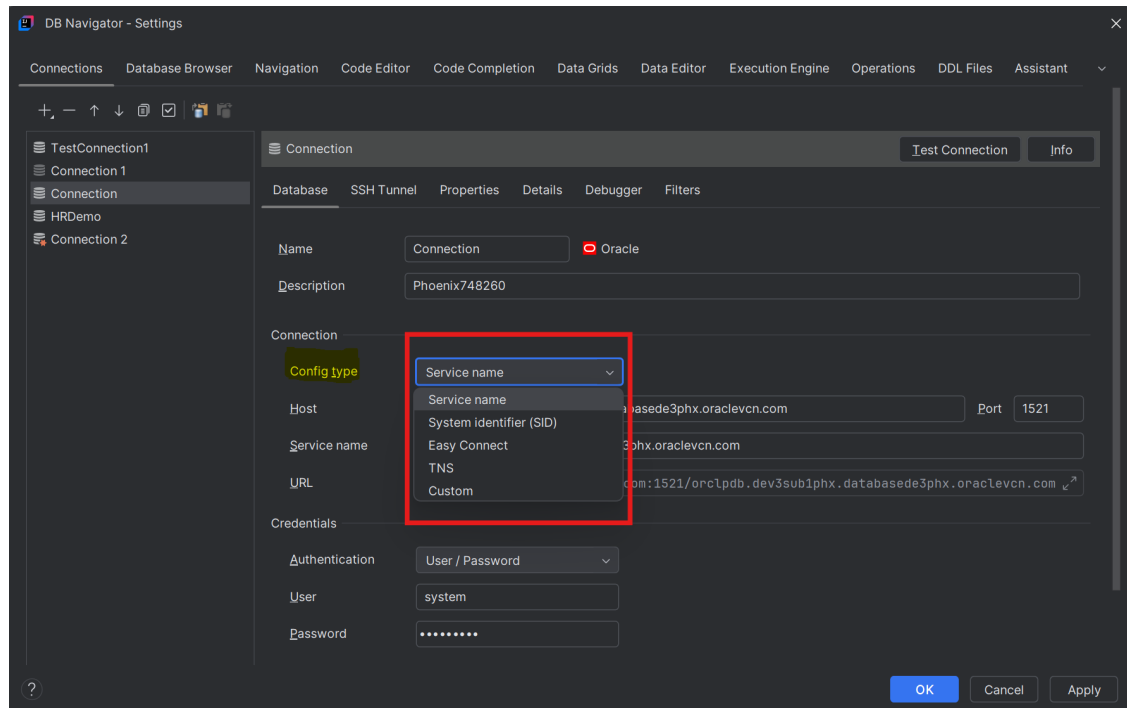
This topic provides an overview of the type of database configuration.

Oracle® Database Navigator provides several ways to configure a database connection and perform authentication. For an Oracle database, you can create a new connection using one of the following configuration methods:

Configuration Type	Description
Basic connection (Service Name or System Identifier)	Requires you to provide the Service Name or SID (System Identifier) of the database you want to connect along with the host name, port number. The database URL field is auto filled.
Easy Connect	Requires you to select the TCP or TCPS protocol and provide the host name, port number, and database service name. You can provide the type of database server and the corresponding Property Value(s). The database URL field is auto filled.
TNS	Requires you to select the folder location (or Oracle wallet location directory) where the TNS config file is stored, and then select the appropriate TNS profile (Network Alias). The database URL field is auto filled.
Custom URL	Requires you to provide the JDBC URL manually, consisting of the protocol, sub-protocol, host name, port number and database name.

Note

Configure an SSH tunnel and authenticate using a password or key/value pair to securely connect to the database. Oracle® Database Navigator plug-in supports connectivity to Oracle Cloud Autonomous databases through simple URL connection using the "Custom URL" configuration type, or via Oracle wallets.



- [Database Authentication](#)
This topic provides an overview of database authentication models.
- [Connection Details](#)
This topic provides an overview of the general settings of a database connection.
- [Connection Properties](#)
This topic provides an overview of setting up a Properties File for database connections.

Database Authentication

This topic provides an overview of database authentication models.

The following authentication types are supported when you connect to an Oracle database:

- Authentication using Username or Username / Password combination
- OS authentication
- Token based authentication

Note

The configuration types and authentication methods vary when you connect to other databases such as, MySQL, PostgreSQL, SQLite, or any custom database.

The following token-based authentication are supported in Oracle Database Navigator:

Token Type	Authentication
OCI API Key	Uses a private/public key pair and a configuration file to authenticate API requests to Oracle Cloud Infrastructure. In the Token Config File field of the Credentials section, select the folder (.oci directory in your user's home directory) to upload the configuration file, for example, ~/.oci/config. This config file contains user details such as user OCID, tenancy OCID, region, fingerprint of the public key and the private key file path. Based on the uploaded configuration file, the Token Profile drop-down field displays the auth token used with that config file that you can select and proceed with the authentication.
	Note If you do not have any existing private/public key pair to upload for creating the configuration file, you must first generate the API keys in your OCI console, download and store the private key with appropriate permissions.
OCI Interactive	Uses the OCI interactive mode to create a temporary session token that is used for database authentication. The following parameters are required when using OCI Interactive authentication method: • Compartment OCID - Provide the compartment OCID to identify the specific compartment within the OCI tenancy. • Database OCID - Provide the database OCID to identify the specific database instance within the OCI environment.
Azure Interactive	Interactive authentication using Azure AD (Microsoft Entra ID) lets you connect to Oracle databases using your Entra ID credentials (leveraging OAuth2 access tokens) and SSO capabilities. The OAuth2 access token contains information such as user identity and access details, which is passed to the Oracle database client for token validation. Once validated, the token is sent to the Oracle database instance to grant access. You need to specify the unique URI for the Oracle database instance in the Database Application Id URI field to establish the connection.

Token Type	Authentication
Azure Service Principal with Certificate	Azure Service Principal enables driver authentication using a certificate of the registered application (Oracle database instance registered with Azure AD), offering a more secure alternative to client secrets. The certificate-based authentication method leverages public/private key pair obtained through a certificate of authentication for identity verification of the database client. The following parameters are required when using Azure Service Principal with Certificate authentication method: • Client Id - Provide the unique application ID (client ID) of the registered database instance. • Tenant Id - Provide the Azure tenancy ID of the registered database instance. • Client Certificate File - Provide the path to the password-protected certificate file (containing the private key) of the Service Principal to establish a secure connection. • Client Certificate Password - Provide the password for accessing the client certificate file containing the private key. • Database application Id URI - Provide the unique URI to identify the Oracle database instance. (For example: <code>your_tenancy_url/application_(client)_id</code>; tenancy name must be domain qualified)

Note

The certificate of authentication can be self-signed for development environment, however, for production environment should be obtained from trusted authorities.

Azure Service Principal with Token	Azure Service Principals leverages token-based authentication to securely access Azure resources and connect to Oracle database. This method uses a Service Principal's credentials (service principal is created when the database client is registered in Azure AD) consisting of a client secret to obtain an access token from Microsoft Entra ID. The following parameters are required when using Azure Service Principal with Certificate authentication method: • Client Id - Provide the unique application ID (client ID) for the registered database instance. • Tenant Id - Provide the Azure tenancy ID of the registered database instance. • Client Secret - Provide the client secret for the registered Oracle database instance (unless the application/database client is public, in which case only the Client Id is required) • Database application Id URI - Provide the unique URI to identify the Oracle database instance. (For example: <code>your_tenancy_url/application_(client)_id</code>; tenancy name must be domain qualified)

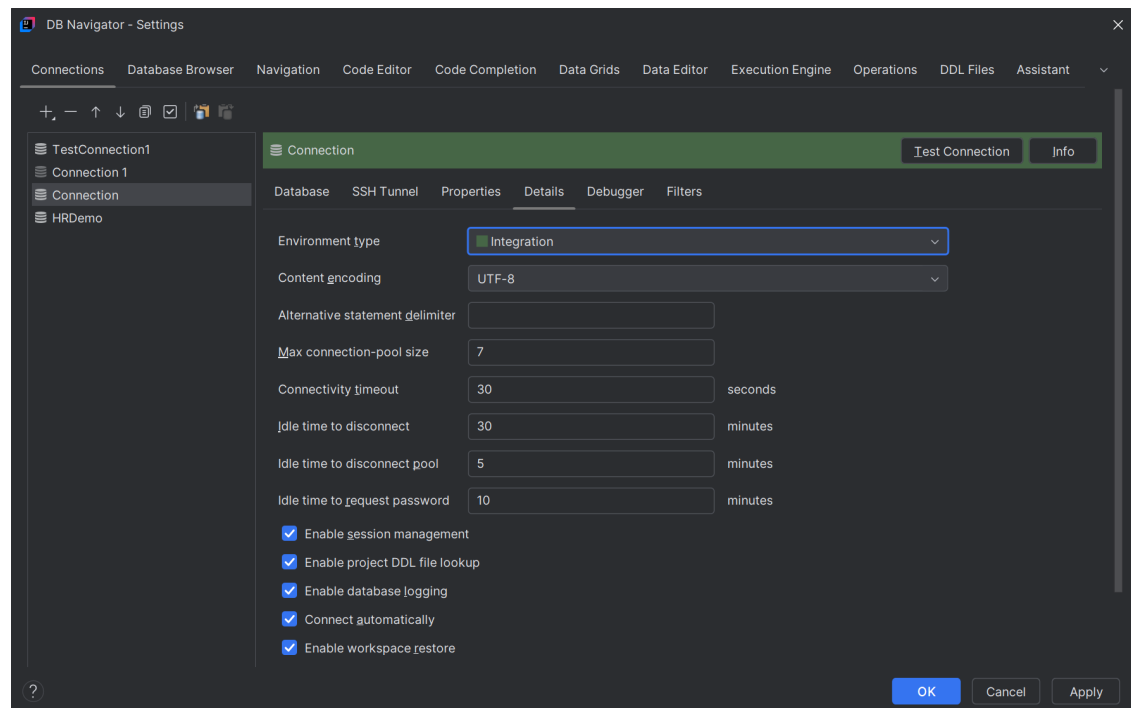
Note

The Azure token authentication support is available for Oracle Autonomous AI Databases, Oracle Exadata Database Service, Oracle Base Database Service, and on-premises Oracle Database 19c and higher. In order to support Azure authentication, Oracle databases must have Microsoft Entra ID authentication configured. The Oracle Databases must be registered with Azure AD.

Connection Details

This topic provides an overview of the general settings of a database connection.

Once a database connection is successfully established, you can configure other details of that connection from the **DB Navigator - Settings** window > **Connection** > **Details** tab.



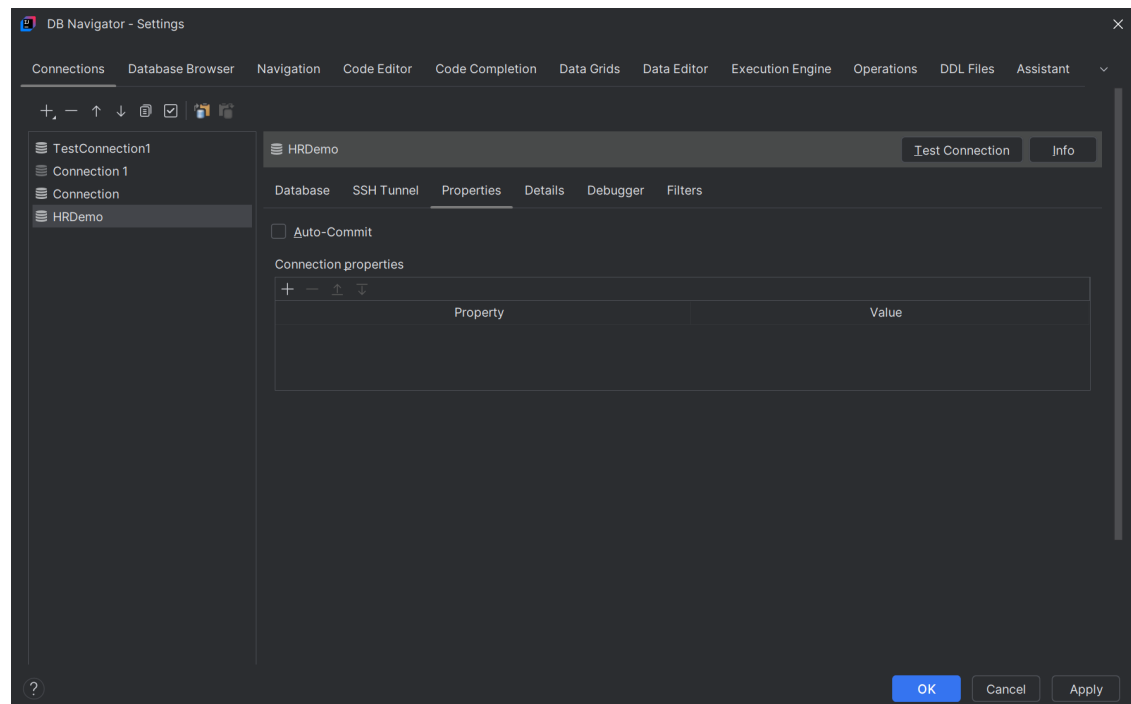
Few connection initialization settings include:

- Specifying the database environment (Development/Integration/Production/Other)
- Content encoding
- Setting the maximum connection pool size or the cache of database connections (that can be reused) at a given time
- Configuring the time duration (in seconds) after which an active connection should get closed.
- Configuring the time duration (in seconds) after which an idle connection (with no activity) should get closed.
- Configuring the time duration (in seconds) after which user credentials (password) to reconnect to the DB is prompted.
- Enabling connection session management
- Enabling log creation for DB events
- Enabling auto-connection to databases that are already successfully connected (every time you open the IDE instance)
- Enabling restoration of workspaces through backups
- Enabling DDL file lookup for DB objects and creating or attaching DDL files to data source

Connection Properties

This topic provides an overview of setting up a Properties File for database connections.

You can setup a database Connection Properties File (or a resource bundle file) with configuration data in the form of key value pairs that is used to establish a connection using JDBC (Java Database Connectivity). You can also use the connection properties file to customize the driver for a database environment. To create a new properties file, access the **Properties** tab on the **DB Navigator - Settings > Connections** window and click the **Add** icon in the **Connection properties** section.

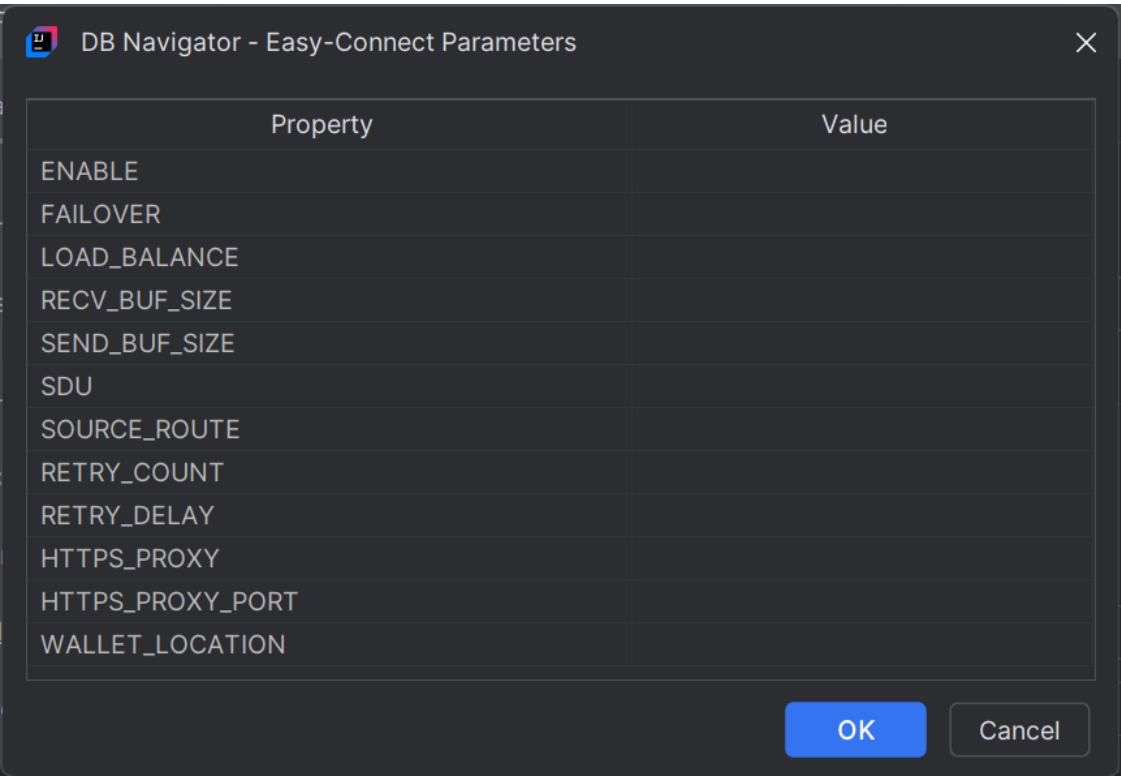


When you use the properties file for a **Driver Manager**, the property is defined as a key-value pair with the syntax *property=value*.

You can configure connection properties for the following categories:

- DB authentication
- Network connection
- TLS/SSL
- High availability
- Tracing
- DRCP
- Sharding
- Performance
- API Behavior

- LDAP



See the [Oracle Driver Connection](#) document for more information on Oracle JDBC connection properties.

Driver Management

This topic provides an overview of driver packages supported by the plug-in.

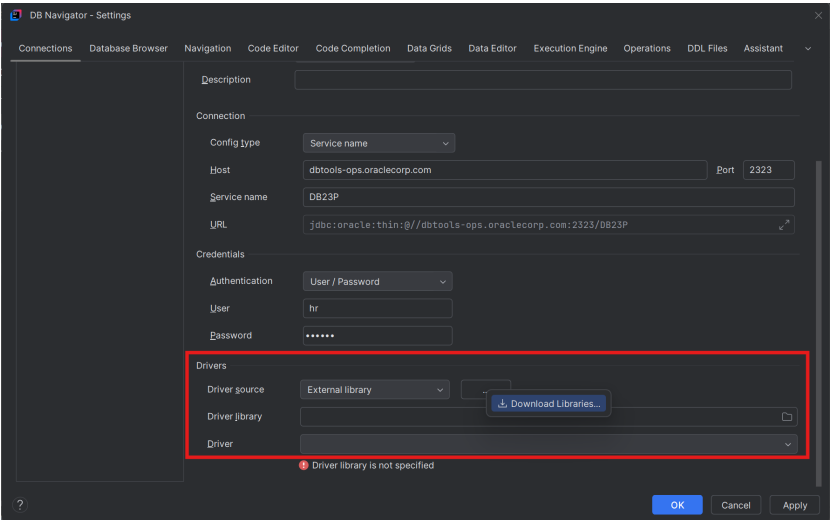
The connectivity to databases is established through JDBC drivers. Oracle® Database Navigator allows you to select one of the following driver packages:

- Bundled Library
- External Library

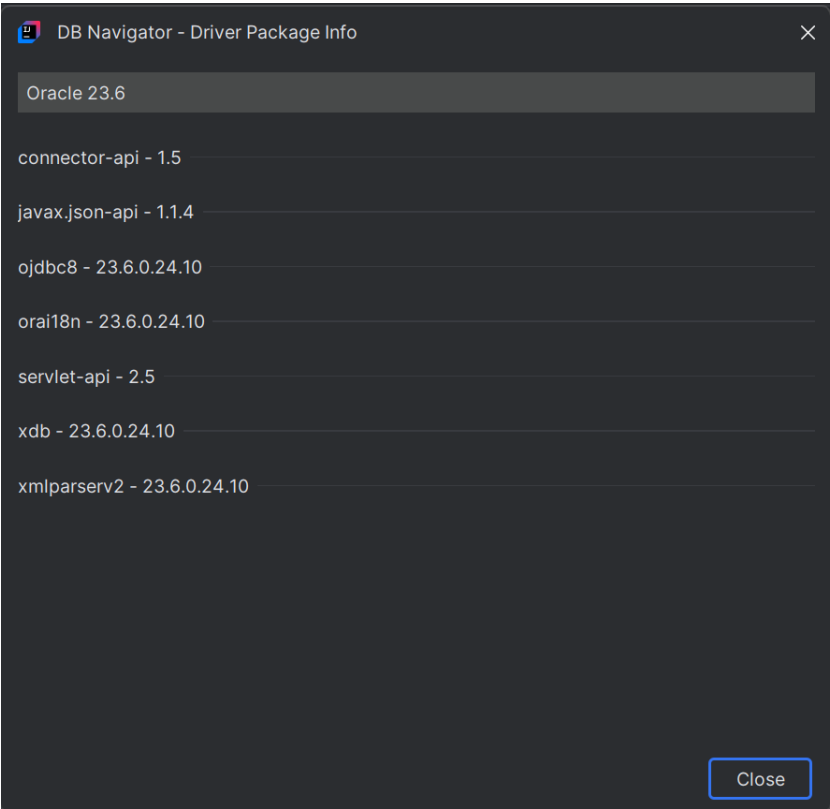
Driver Source	Desrciption
Bundled Library	This configuration uses the drivers delivered with the database you want to connect. JDBC drivers for the supported databases are delivered with the product binaries (this option is recommended for less experienced users). The latest stable versions of the drivers at the time of release are provided.

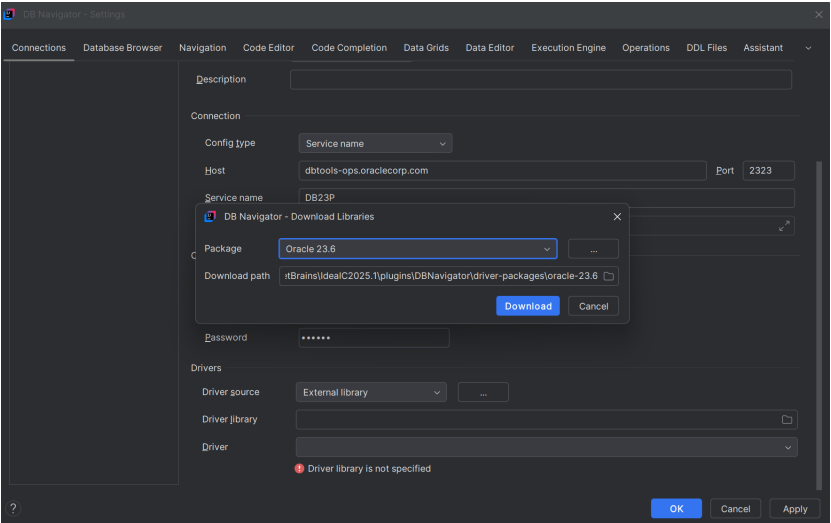


Driver Source	Description
External Library	This configuration allows you to select externally downloaded driver libraries. <i>Guided External Driver Package download</i> After selecting the Driver Source as External library, you have the option of downloading available external packages.



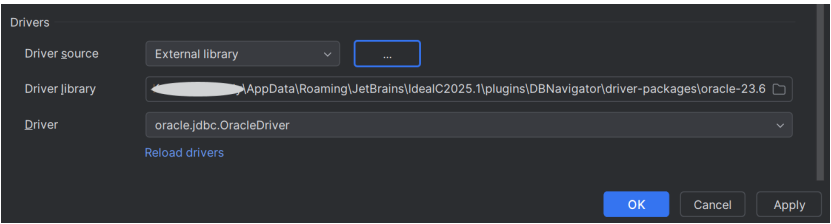
Through this guided download feature, you can download available external libraries to your local machine and then select the driver package to connect.



Driver Source	Desrciption
	

Custom External Driver Package download

You can also have external custom driver packages downloaded on your local workstation. After selecting the **Driver Source** as **External library**, proceed to select the external library location on your workstation where the driver package is located. Selecting the directory folder displays the available **Drivers** as drop-down options to select.



3

Environment Types

This chapter provides an overview of database environment types and their configuration in the Database Navigator tool.

The distinct environment types to which an instance of database can belong in Oracle® Database Navigator include:

- Development environment
- Integration environment
- Production environment

By default, every new database connection you create in Oracle® Database Navigator is unassigned to any specific environment. You can assign an environment type to the database connection, change the environment type of the DB connection, as well as create custom environment types, such as a Testing or UAT environment.

Topics:

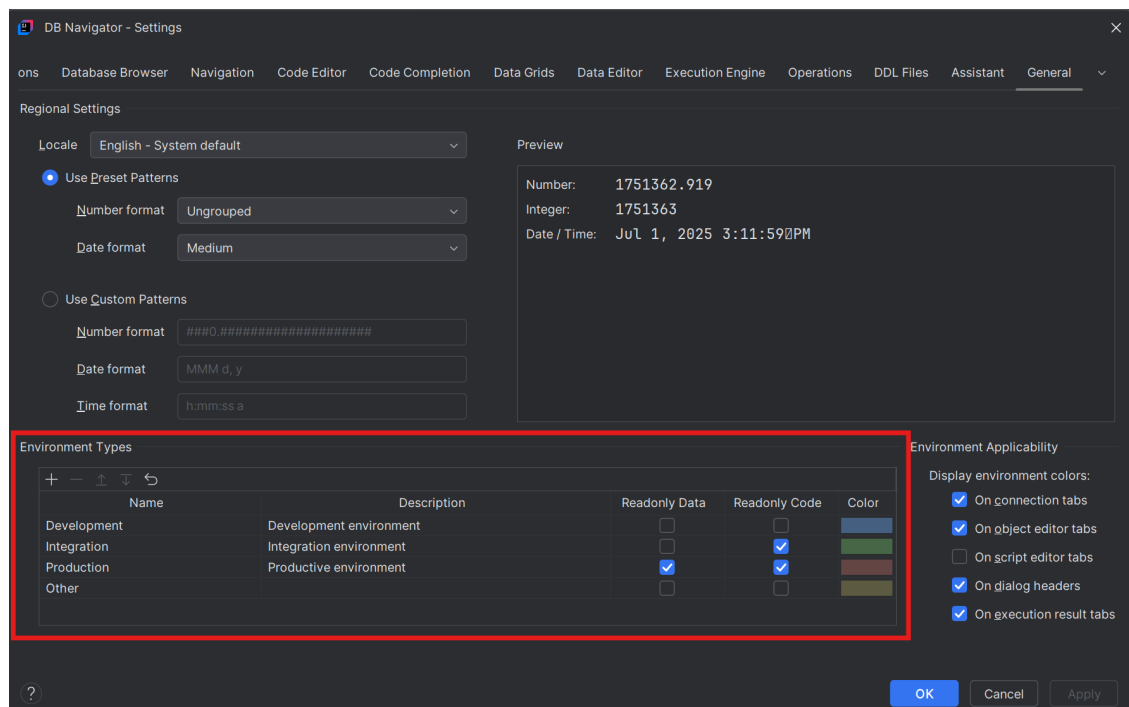
- [Configuration of Database Environments](#)
This topic provides configuration information of database environment types.
- [Creating Environment Types](#)
This topic describes the procedure to create custom database environments.
- [Assigning Environment Types to Database Connections](#)
This topic describes the procedure to assign an environment type to a database connection.

Configuration of Database Environments

This topic provides configuration information of database environment types.

Oracle® Database Navigator enables you to create new database environments, configure them and assign those environments to database connections.

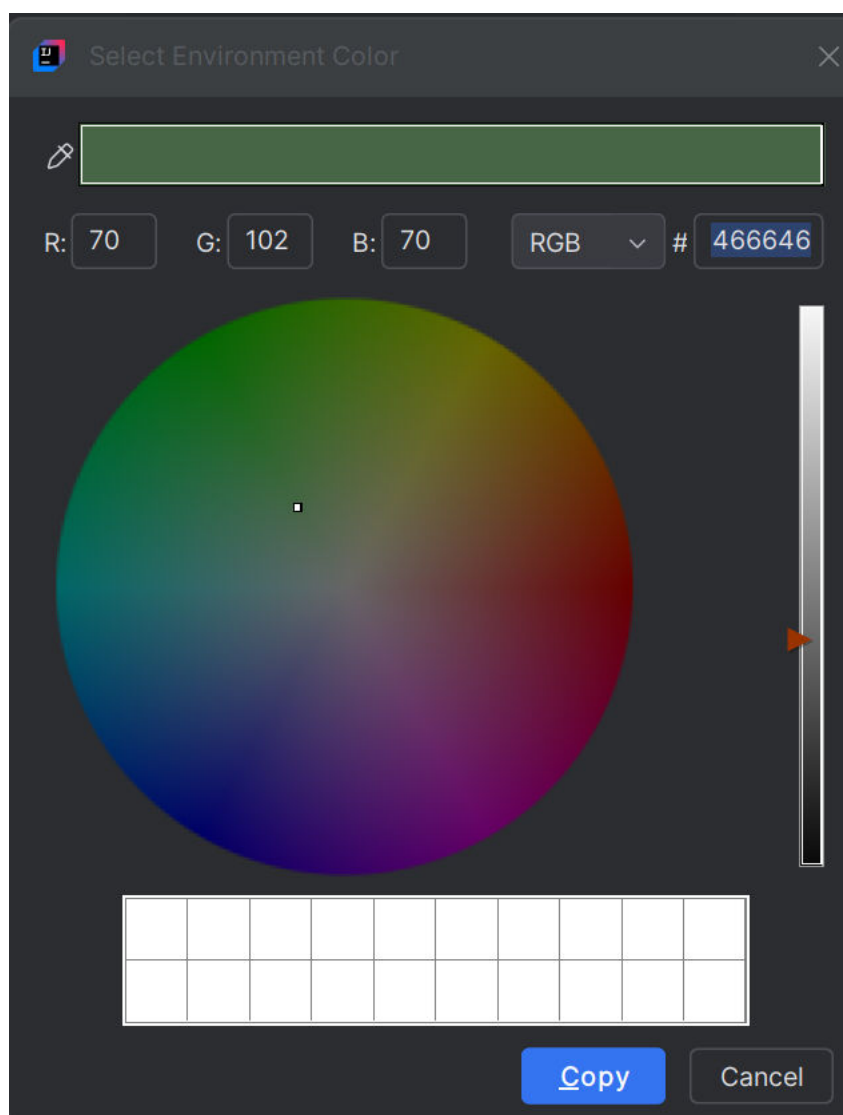
To manage environment types, from the Main menu of Oracle® Database Navigator, select **DB Navigator > Settings > General** tab and refer the **Environment Types** section.



If a database connection is not associated with any environment type, there are no restrictions on the read/write transactions that you can perform on the data. The environment types can be configured to be non-editable (read-only) where you cannot make changes to the Data and/or the Code, based on the environment settings.

By default, for any environment type, there are no restrictions on editing the data or the code. To make an environment non-editable, select the **Readonly Data** and/or **Readonly Code** check boxes, respectively.

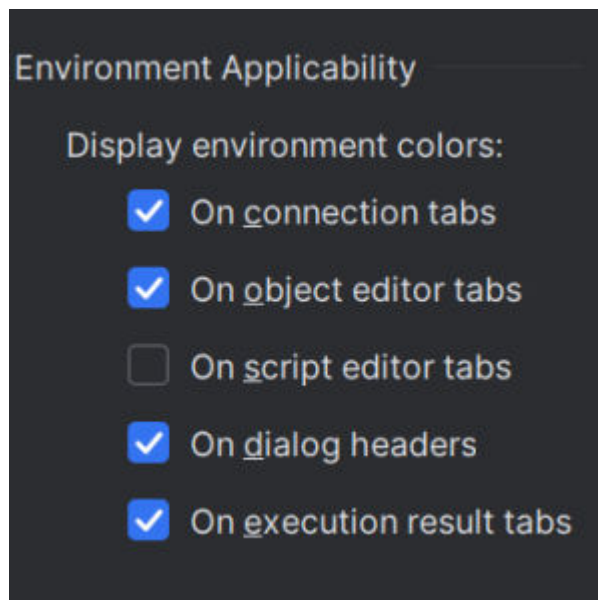
For convenience, each listed environment type is color-coded so that you know what behavior to expect when you use the database connection in the DB Browser window. You can change the color coding by clicking the **Color** bar and selecting the desired color from the color wheel or entering the RGB color code on the **Select Environment Color** window.



The color you set for each environment type is visible on the following interface segments:

- Connection tabs
- Object editor tabs
- Script editor tabs
- Dialog headers
- Execution result tabs

You can enable or disable the color-coded environment display from the **Environment Types** section > **Environment Applicability** settings.



Creating Environment Types

This topic describes the procedure to create custom database environments.

1. From the **DB Navigator - Settings** window > **General** tab > **Environment Types** section, click the + icon.

A new row is added to the list of existing database environment types.

2. Enter the details for the following fields:

Field	Description
Name	Enter the name of the new environment type.
Description	Enter a description for the environment type.
Readonly Data	Select the check box if you want to keep the data for the environment to be non-editable (read-only).
Readonly Code	Select the check box if you want to keep the database code for the environment to be non-editable (read-only).
Color	Optionally, select a color to color-code the new environment type.
Environment Applicability	If you have applied a color, select the desired check boxes to display the environment color on UI tabs.

3. Click **OK** to save the new environment type.

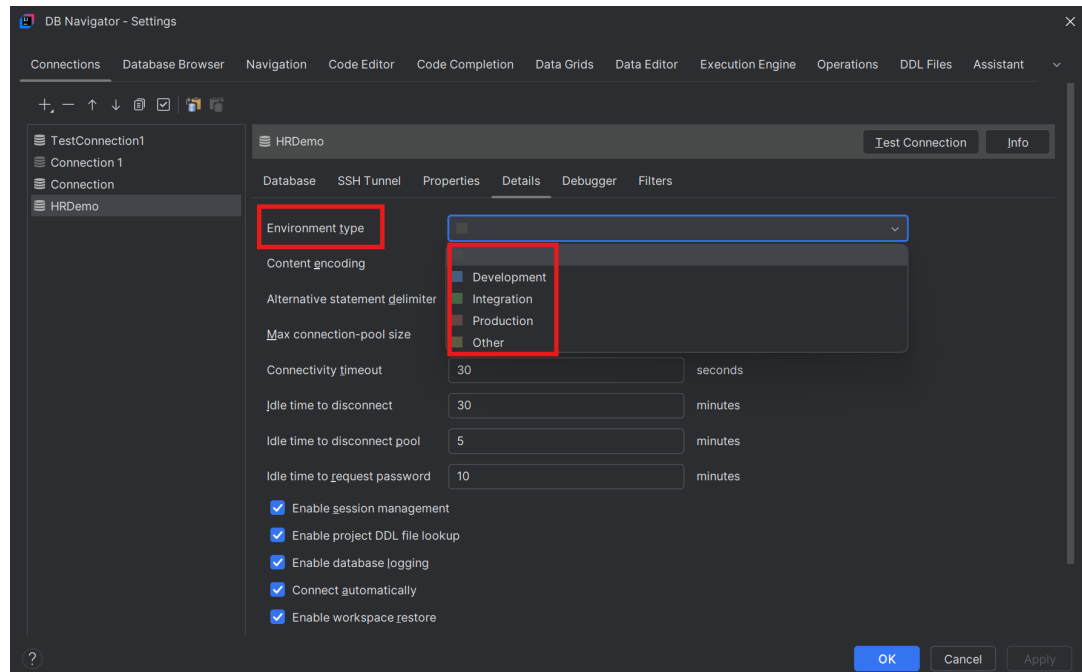
To remove an environment type from the list of environments, select the environment and click the - icon.

Assigning Environment Types to Database Connections

This topic describes the procedure to assign an environment type to a database connection.

1. Right-click the database connection from DB Browser window and click **Settings** to open the **DB Navigator - Settings > Connections** window.
2. From the **Details** tab > **Environment Type** drop-down list, select the environment you want to assign to the connection.

All available environment types are listed by their names and color codes, if any.



3. Click **OK** to apply the environment type to your database connection.

The properties configured for the selected environment type gets applied to the connection.

4

Session Browser

This chapter describes database sessions within active database connections.

The **Session Browser** of Oracle® Database Navigator plug-in provides you control and visibility of your active database sessions and monitor their performance. The session browser window allows you to perform following actions among others:

- view details of a connection session
- search for specific session data in all the listed sessions
- filter and sort session information based on various criteria
- manage sessions, disconnect or terminate sessions
- manage resource usage

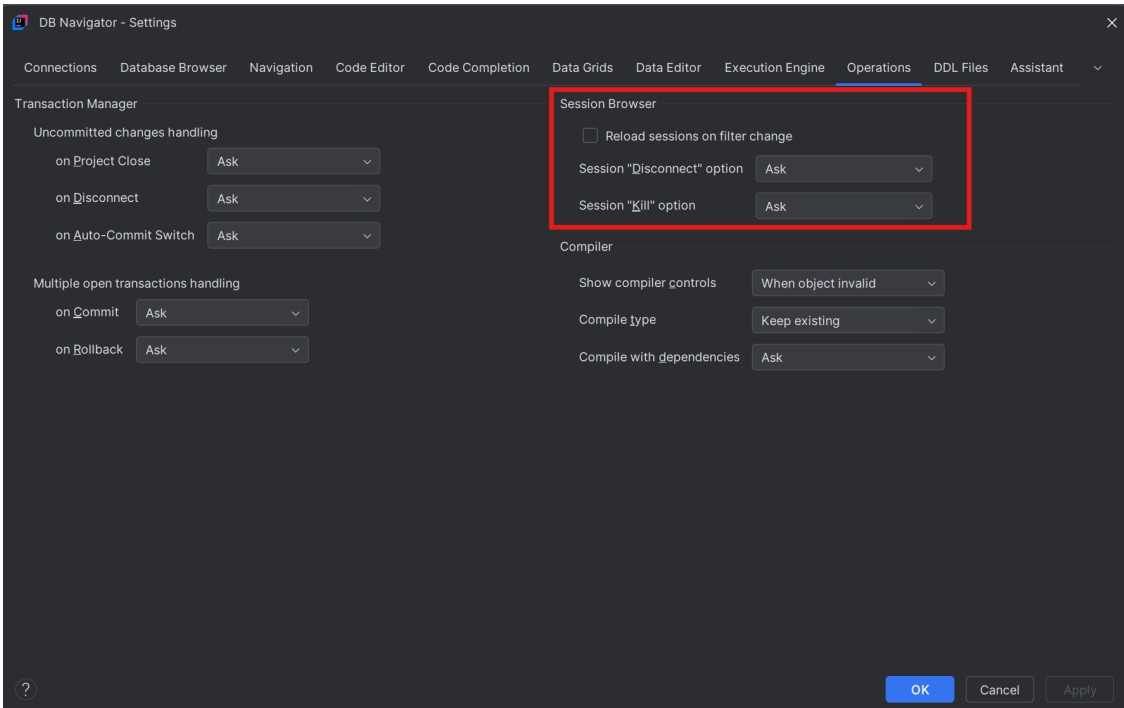
Topics:

- [Session Browser Settings](#)
This topic provides an overview of configuring database Session Browser window.
- [Viewing Database Sessions](#)
This topic describes the procedure to view details of a database session for active database connections.
- [Database Session Operations](#)
This topic provides an overview of operations that can be performed over database sessions.

Session Browser Settings

This topic provides an overview of configuring database Session Browser window.

The session browser window provides information of active database sessions. To configure basic settings to view in the database session browser, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Operations** tab and refer the **Session Browser** section.

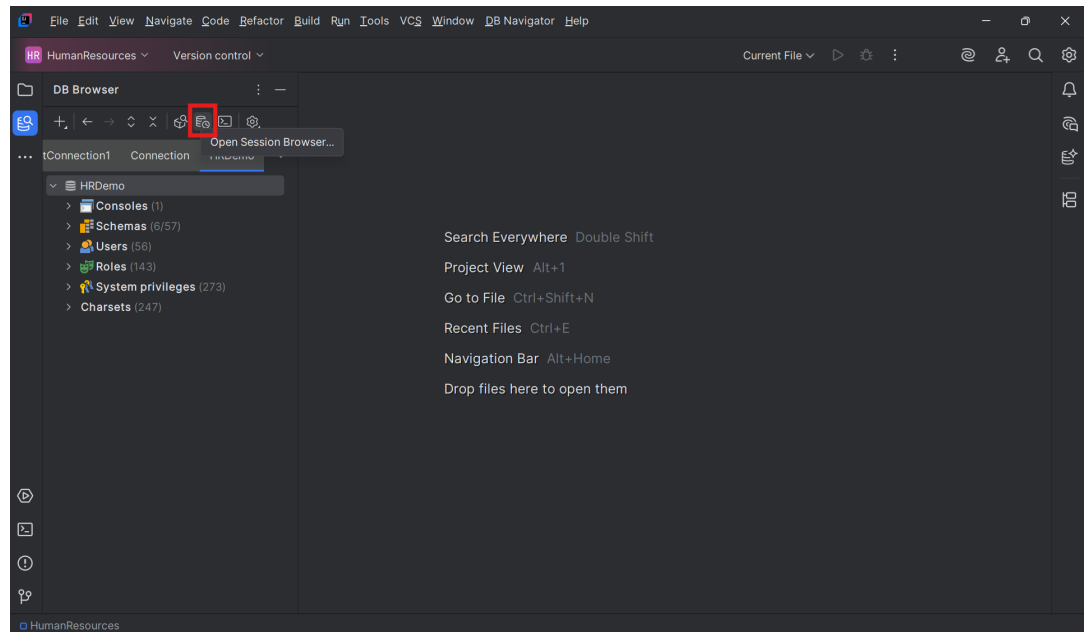


Settings	Configurations
Reset sessions on filter change	Selecting this check box refresh the session information every time you apply some filter to the session data to sort or narrow down the session information
Session "Disconnect" option	- Setting this option to Ask will display a confirmation message to ask whether you want the session to be disconnected immediately or post transaction. - Setting this option to Post Transaction will wait for the current ongoing transactions to complete before disconnecting the session. - Setting this option to Immediate will disconnect the database session immediately without any confirmation.
Session "Kill" option	- Setting this option to Ask will display a confirmation message to ask whether you want the session to be terminated immediately or normally (from database level through ALTER SYSTEM KILL SESSION command) - Setting this option to Normal will mark the session as terminated, roll back ongoing transactions, release the session locks and recover session resources before the actual termination. - Setting this option to Immediate will terminate the dedicated session and processes immediately (or as soon as possible).

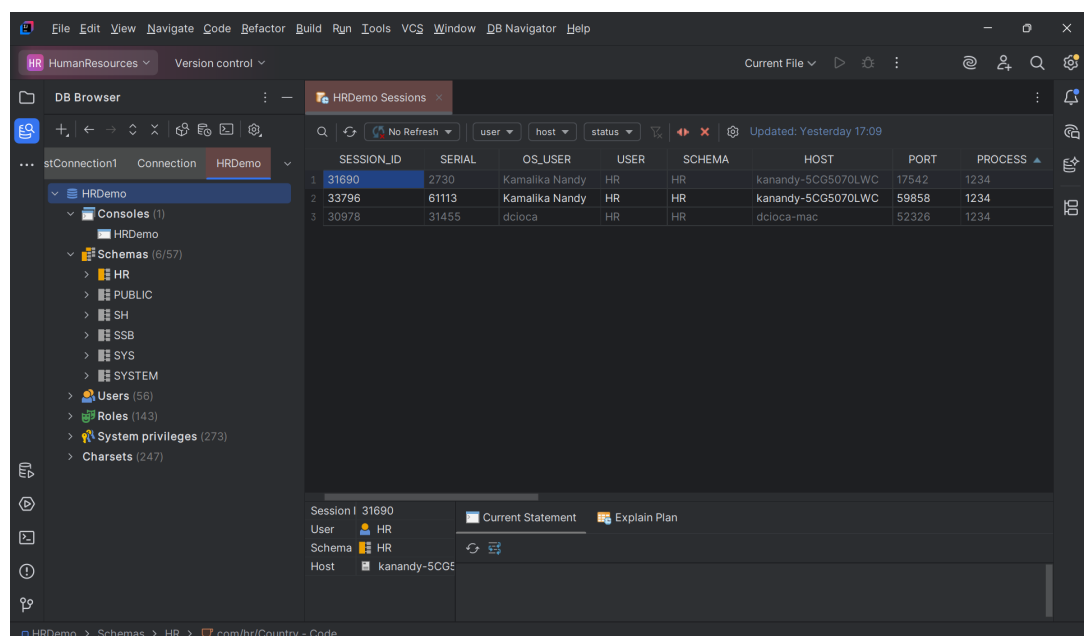
Viewing Database Sessions

This topic describes the procedure to view details of a database session for active database connections.

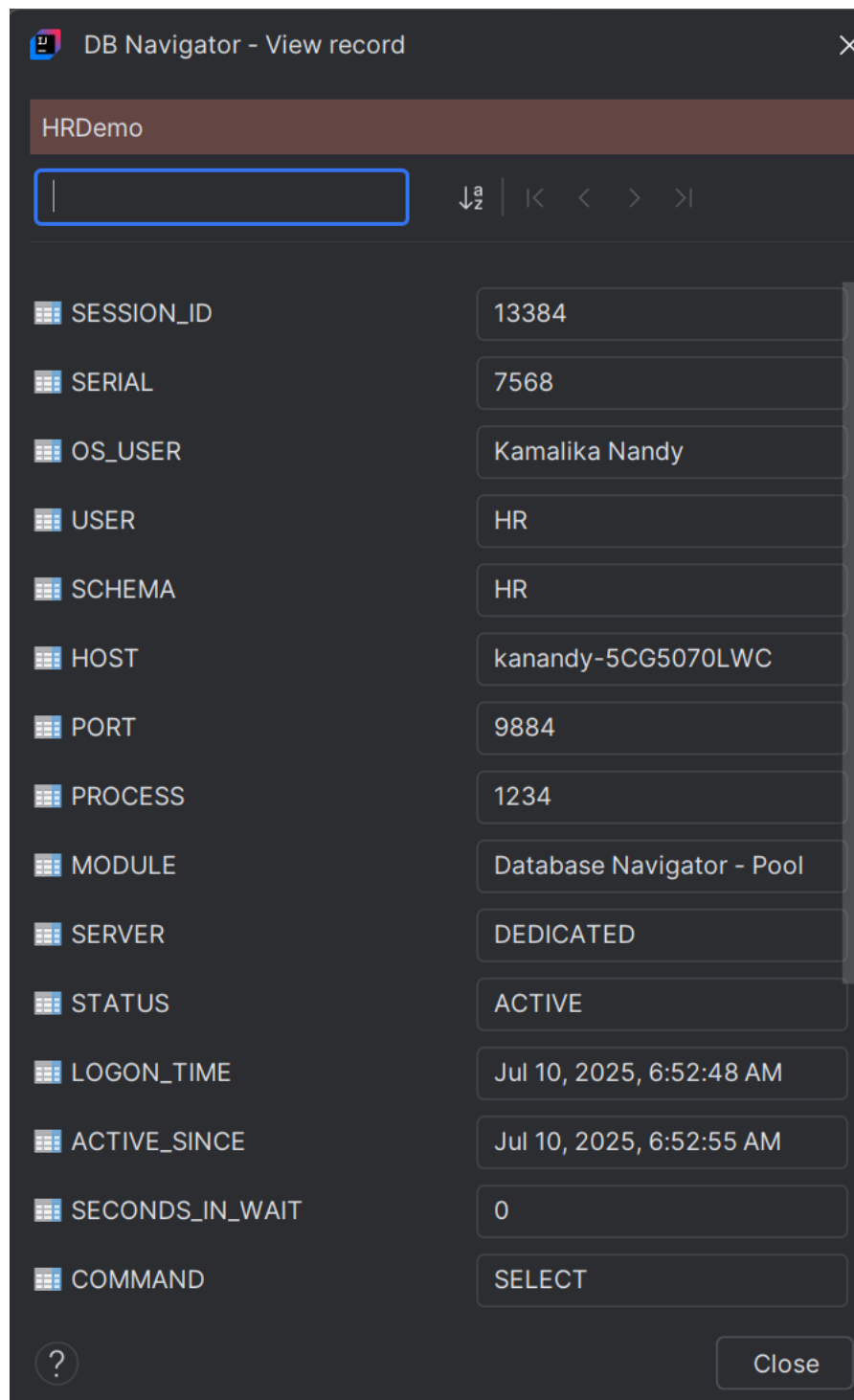
1. From the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Open Session Browser** option.
2. Select the database connection from the list of available connections.
3. Alternatively, from the **DB Browser** window, select any of the active database connections and click the **Open Session Browser** icon available on the browser toolbar.



The session browser for the connection opens in a separate window.



4. Double-click any **Session ID** to open the records in a separate window and view the session details.



The following session details are displayed for each session:

- Session_ID
- Serial
- OS_User
- User
- Schema

- Host
- Port
- Process
- Module
- Server
- Status
- Active_Since
- Command
- Seconds_In_Wait
- Action
- SQL_ID
- Coord_Session_ID
- Resource_Consumer_Group
- Client_Info
- Client_Identifier

Database Session Operations

This topic provides an overview of operations that can be performed over database sessions.

Based on the database type for which you have the session browser open, you can perform various operations on the DB sessions from the toolbar menu. Some common operations that you can perform on an open connection session are as follows:

Description	
	Search for specific session information through matching text (case sensitive or whole words) or regex pattern
	Reload the list of database sessions with updated session information and current state of the database

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AConfigure auto-refresh for the session and set the time durations (in seconds) to refresh the session, or use to never automatically refresh (No-Refresh) the session.

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SFilter to view database sessions by either or all of the following:

- o. Users having access to the session
- r. Session Host
- t. Current Status (Active/Inactive) of the database session

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DDisconnect a selected session from the server. Based on the Session Browser settings, the session is disconnected either:

- S. immediately, or
- C. after the ongoing transaction in the session are complete, or
- O. after you review the active and open transactions and confirm to disconnect

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Kill or terminate the selected session or session instance. Based on the Session Browser settings, the session is terminated either:

- l immediately, or,
- l after the ongoing transaction are rolled back, session locks released, and session resources are recovered
- S after you review the active and open transactions in the session and confirm to terminate
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Access the Session Browser settings in the **DB Navigator > Settings > Operations** tab

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View the SQL script of the ongoing transaction on the selected session

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5

Transaction Management

This chapter provides an overview of database transaction management.

Transaction Management in Oracle® Database Navigator ensures atomicity and isolation of database operations so that the transactions are executed separately, are complete and committed into the database. In case a part of the transaction fails, transaction management enables you to roll back the entire transaction and bring the database connection to a valid state.

Topics:

- [Transaction Handling](#)
This topic describes handling any open or uncommitted database transaction.
- [Resource Monitor](#)
This topic describes the usage of resource monitor in the Database Navigator plug-in.
- [Session Management](#)
This topic provides an overview of database session management.

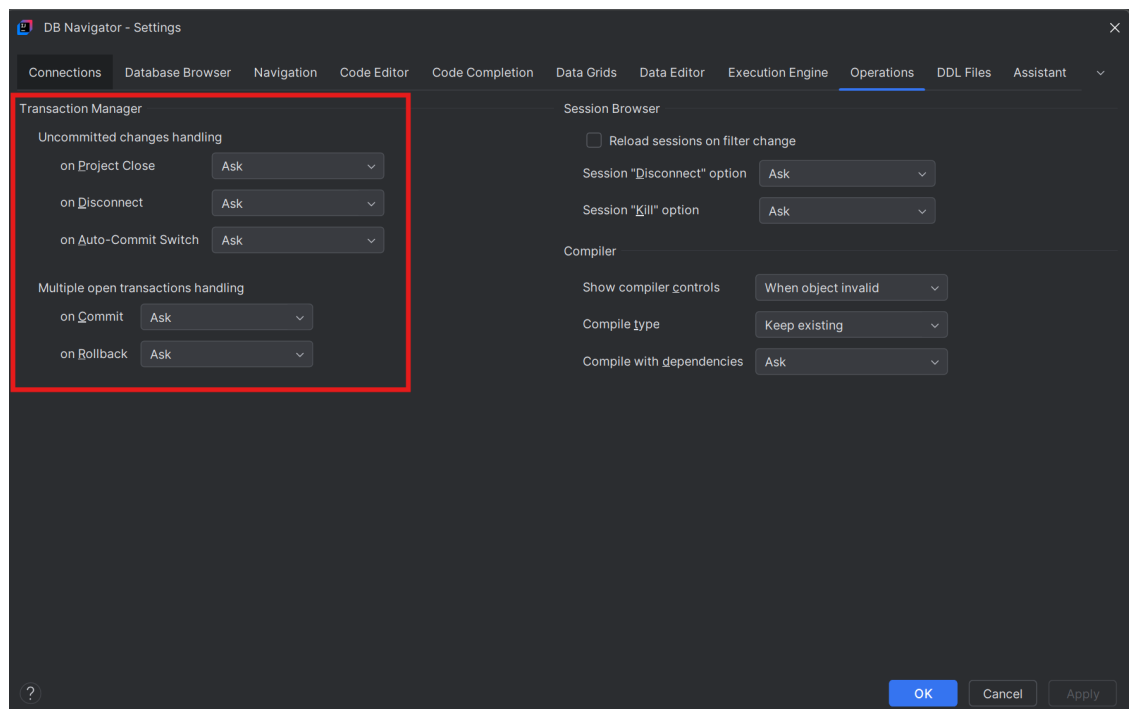
Transaction Handling

This topic describes handling any open or uncommitted database transaction.

Oracle® Database Navigator allows you to handle multiple open transactions and uncommitted changes through the **Transaction Manager**. You can commit changes to the database using the following two modes:

- **Auto-Commit mode** - In this mode the uncommitted changes are immediately transferred to the database after the transactions are executed, without the need of any manual commits
- **Manual Commit mode** - In this mode you can commit or rollback changes manually after reviewing those changes

To configure the **Transaction Manager** settings, from the Main menu of Oracle® Database Navigator, select **DB Navigator > Settings > Operations** tab.



You can control the following from the **Transaction Manager** settings section.

Handle uncommitted changes when:

1. you close a project
2. the database session is disconnected
3. you switch from manual mode to auto-commit mode

Handle multiple open transactions when:

1. you try to commit multiple open transaction
2. you try to roll back multiple open transactions

For any of the above-mentioned scenarios, you can set the configurations to one of the following:

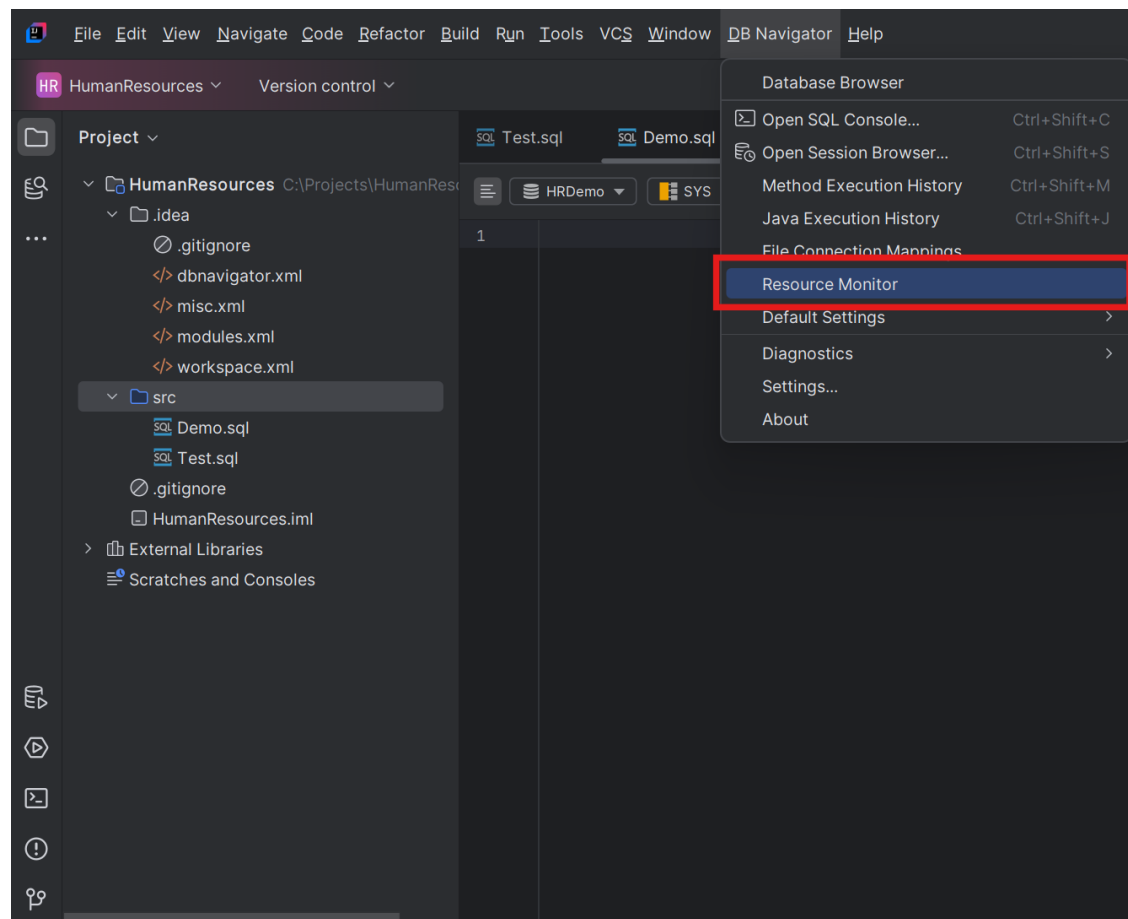
Options	Description
Ask	A confirmation message is displayed for committing the changes into the database. If you confirm the changes are committed immediately without you to do any manual commits or review the changes.
Commit	Uncommitted changes are immediately transferred to the database. Not applicable if you try to rollback multiple uncommitted changes.
Rollback	Uncommitted changes are rolled back automatically and not transferred to the database. Not applicable if you try to commit multiple uncommitted changes.
Review Changes	Uncommitted changes are displayed for you to review them before you manually commit those changes.

Resource Monitor

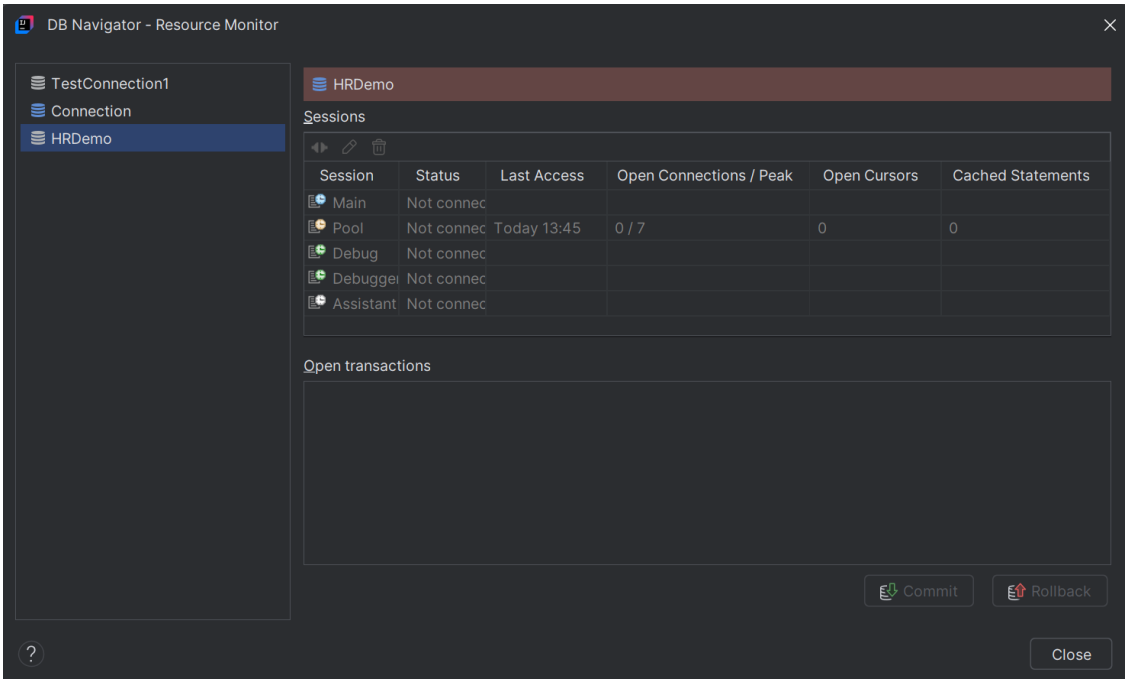
This topic describes the usage of resource monitor in the Database Navigator plug-in.

The **Resource Monitor** displays information about resource allocation of database sessions and all the open or uncommitted transactions (on any open cursor) in those sessions. Database sessions are isolated instances of a database connection that are assigned to active transactions. Based on your user privileges, you can either view only the session(s) to which you have access or all/multiple sessions in the database connection.

To access the **Resource Monitor** window, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Resource Monitor**.



The **DB Navigator - Resource Monitor** window opens listing all the connected databases and their corresponding active sessions with open transactions.



You can view some default sessions for a selected DB connection as follows:

Database Sessions	Description
Main	The Main session is a dedicated workspace (in logical context) within the database connection that is used for handling read/write operations such as querying, updating or managing data in the database. The Main session begins when the database is connected and ends when the database is disconnected.
Pool	Used for background tasks (read-only) such as loading data dictionary for the DB connections. A Pool session is assigned to the transaction (or client) requesting for the DB connection for a specific duration, and after the transaction is complete the session is returned to the pool of open database connections. The maximum number of pool sessions (Peak) that the Database Navigator tool can access at a time is configurable from DB Navigator - Settings > Connections > Details tab > Max connection-pool size field, for that DB connection.
Debug	A Debug session (corresponding to the application or code/query/method being debugged) begins when the database connects to a debugging session running in the background and ends once the debugging is complete.
Debugger	This session corresponds to the debugger agent used to execute the debugging of the program/query.
Assistant	Used for the DB Assistant module of Oracle® Database Navigator (using Oracle Select AI features) as a reserved connection. This special session is accessed when you interact with the DB Assistant chat feature (Interactive) to query a data model using natural language prompts. For more information, see Use Select AI for Natural Language Interaction with your Database

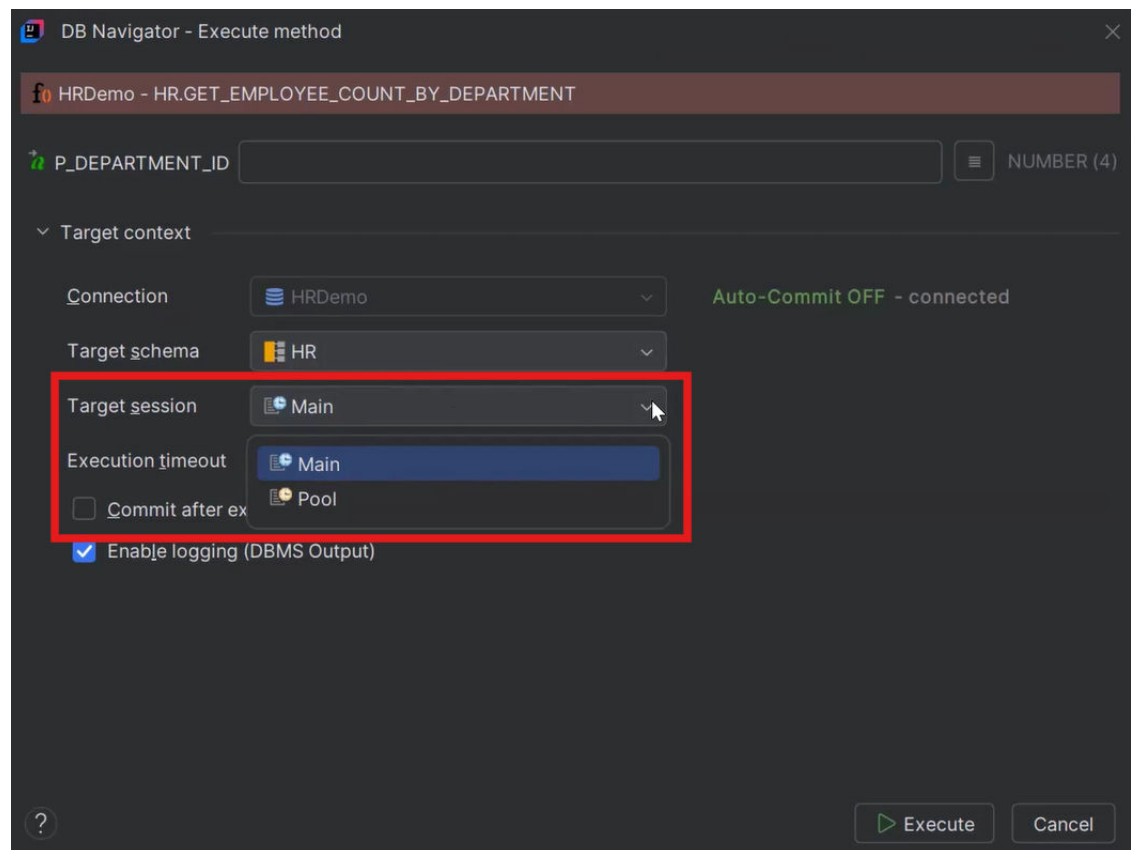
Session Management

This topic provides an overview of database session management.

For every session listed on the **Resource Monitor** screen, the following session details are available:

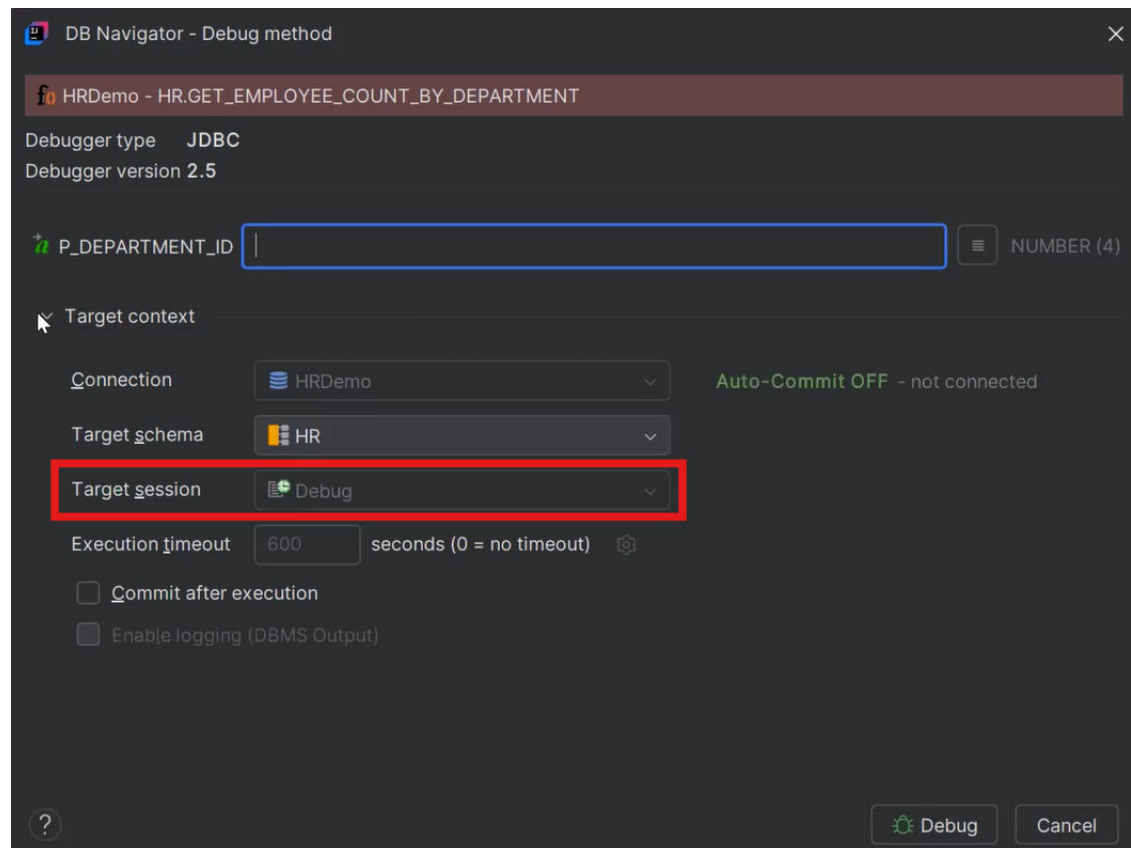
- **Session** - Name of the database session.
- **Status** - Current status of the session ('Green' colored icon indicates session is "Active"/ 'Red' colored icon indicates session is "Dormant").
- **Last Access** - Time elapsed since the session was last accessed by any database transaction.
- **Open Connections/Peak** - Total number of sessions in pool that are accessed for the database transaction, out of the total number of sessions available in the pool at a given point of time.
- **Open Cursors** - Total number of open cursors (handles to private SQL areas) in the session.
- **Cached Statements** - Total number of prepared query statements that have been cached for the session.
- **Open Transactions** - Transactions that are not complete and committed in the session.

You can select the Main session, the Pool session or any other custom session in the connected database and check the open transactions. You can also choose the session in which you want to run/debug a code or program. For example, if you are executing a database function, you can select the **Target Session** from the available sessions, where the execution will take place.



Sessions that are accessed internally by specific Oracle® Database Navigator features can be accessed only when corresponding the operations are in progress. For example, if you are

debugging a database method, the **Target Session** accessed by default is the "Debug" session, which cannot be changed.



For all the **Open Transactions** in a database session, you can either choose to manually commit the changes or roll back the changes by clicking **Commit** and **Rollback** buttons, respectively on the **Resource Monitor** window.

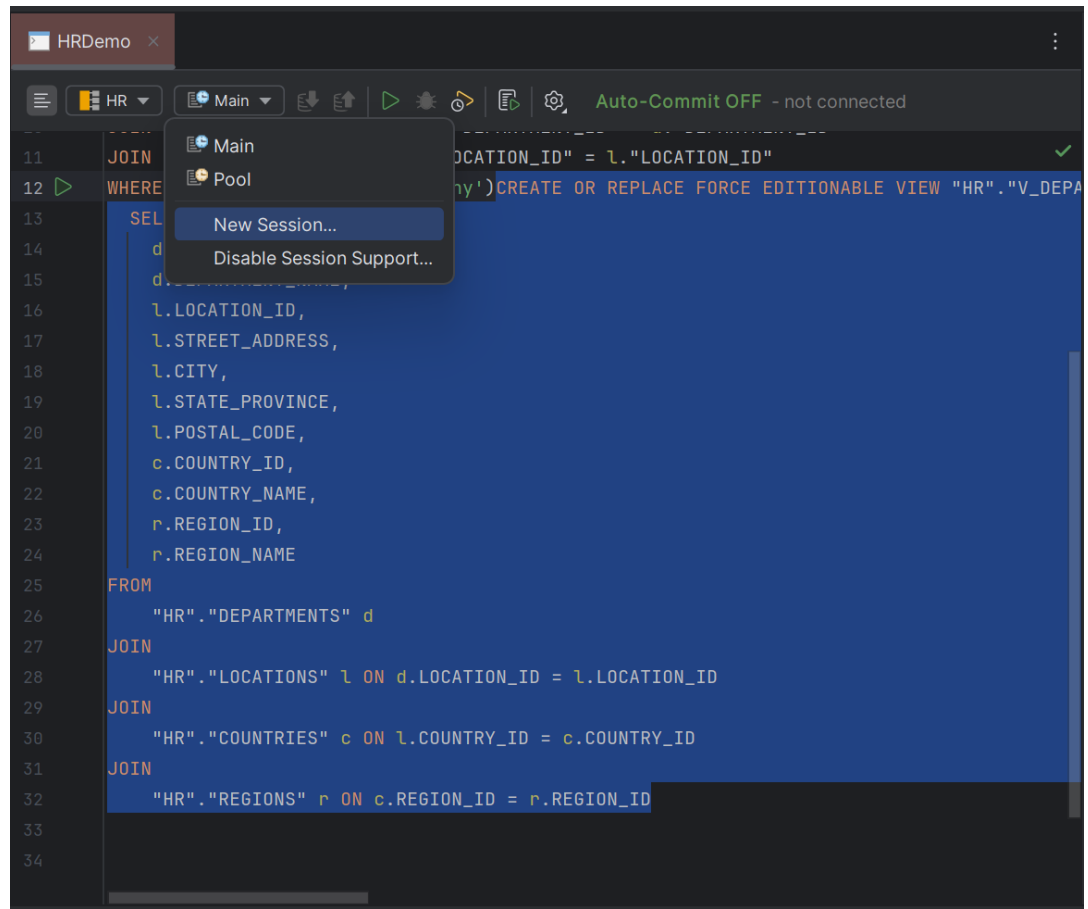
- [Creating Database Sessions](#)
This topic describes the procedure to create new sessions within connected databases.

Creating Database Sessions

This topic describes the procedure to create new sessions within connected databases.

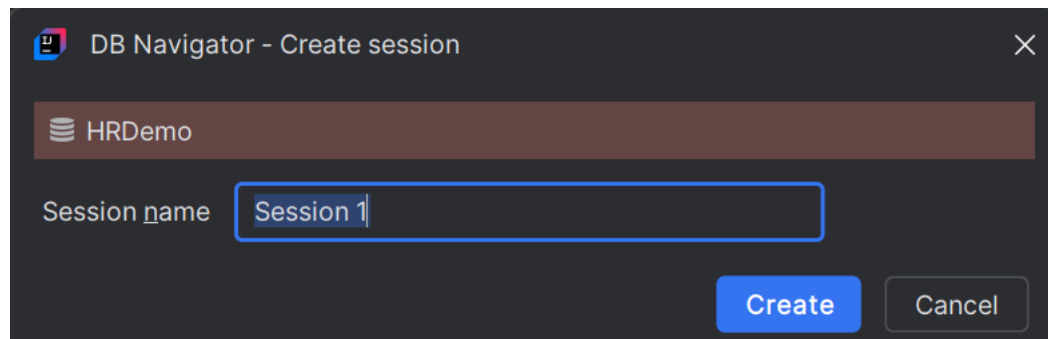
1. From the **DB Browser** window of the Oracle® Database Navigator tool, unfold a database connection tree and open the main database **Console** by double-clicking the console name.

The console opens as a new tab on the editor panel having the tab name same as the name of the console.
2. From the toolbar menu of the editor, click the drop-down field displaying available database session as options and select **New Session**.



The **DB Navigator - Create Session** dialog box opens displaying the name of the database connection in which the session is created.

3. Enter the **Session Name** and click **Create**.



The new session is created for the respective database connection and displayed in the drop-down to select DB session. You can associate the new session within a database connection with your local project files.

Note

The new session you create gets listed on the Resource Monitor window to monitor the open and uncommitted transactions pending for the session.

Once a session is created within a DB connection, you can perform the following operations from the Resource Monitor window:

- Rename an existing database session
- Disconnect an ongoing session
- Delete a database session
- Manually commit open transactions using the database session
- Roll back any uncommitted changes using a session

To control which connections should be issued sessions, use the **Disable Session Support** option to disable session creation for that database connection.

6

Workspace Integration

This chapter provides an overview of workspace integration and mapping database connections to projects.

Oracle® Database Navigator tool supports workspace integration by keeping multiple data integration projects and their resources (data assets, data flows, tasks, and so on) separate from each other. For example, you can have separate workspaces for development, testing, and production database environments.

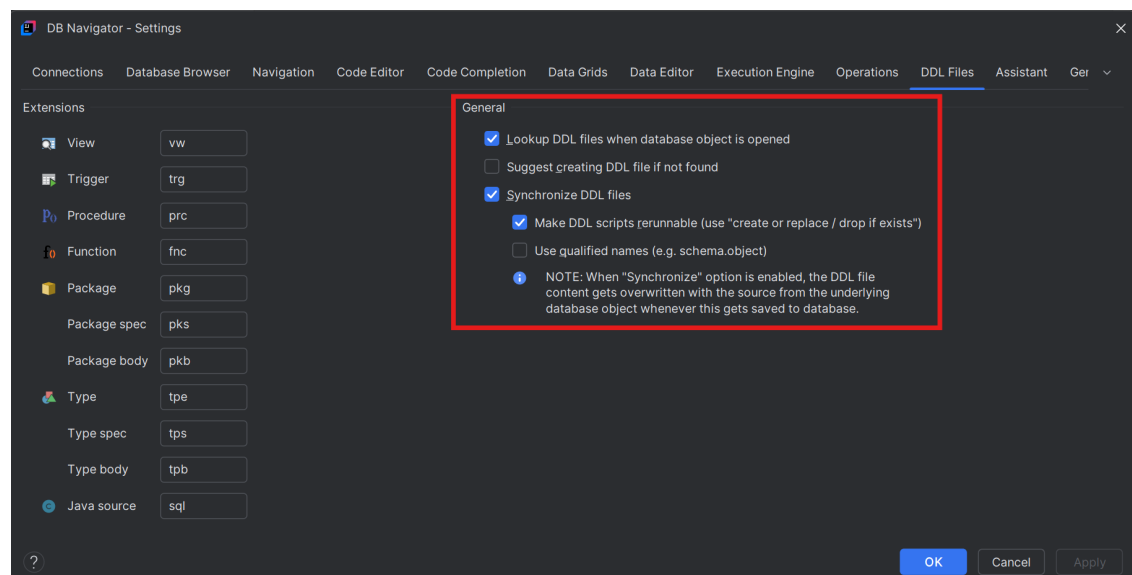
Topics:

- [DDL File Management](#)
This topic explains configuration and synchronization of DDL script files.
- [DDL File Extraction](#)
This topic provides an overview of extracting DDL scripts associated with database objects.
- [File Connection Mapping](#)
This topic provides an overview of mapping local project files to database connections.

DDL File Management

This topic explains configuration and synchronization of DDL script files.

Oracle® Database Navigator allows you to view and synchronize DDL files used in the creation and modification of the database objects in the schema. To manage the DDL files in your projects, from the Main menu of the Oracle® Database Navigator toolbar, select **DB Navigator** > **Settings** > **DDL Files** tab.



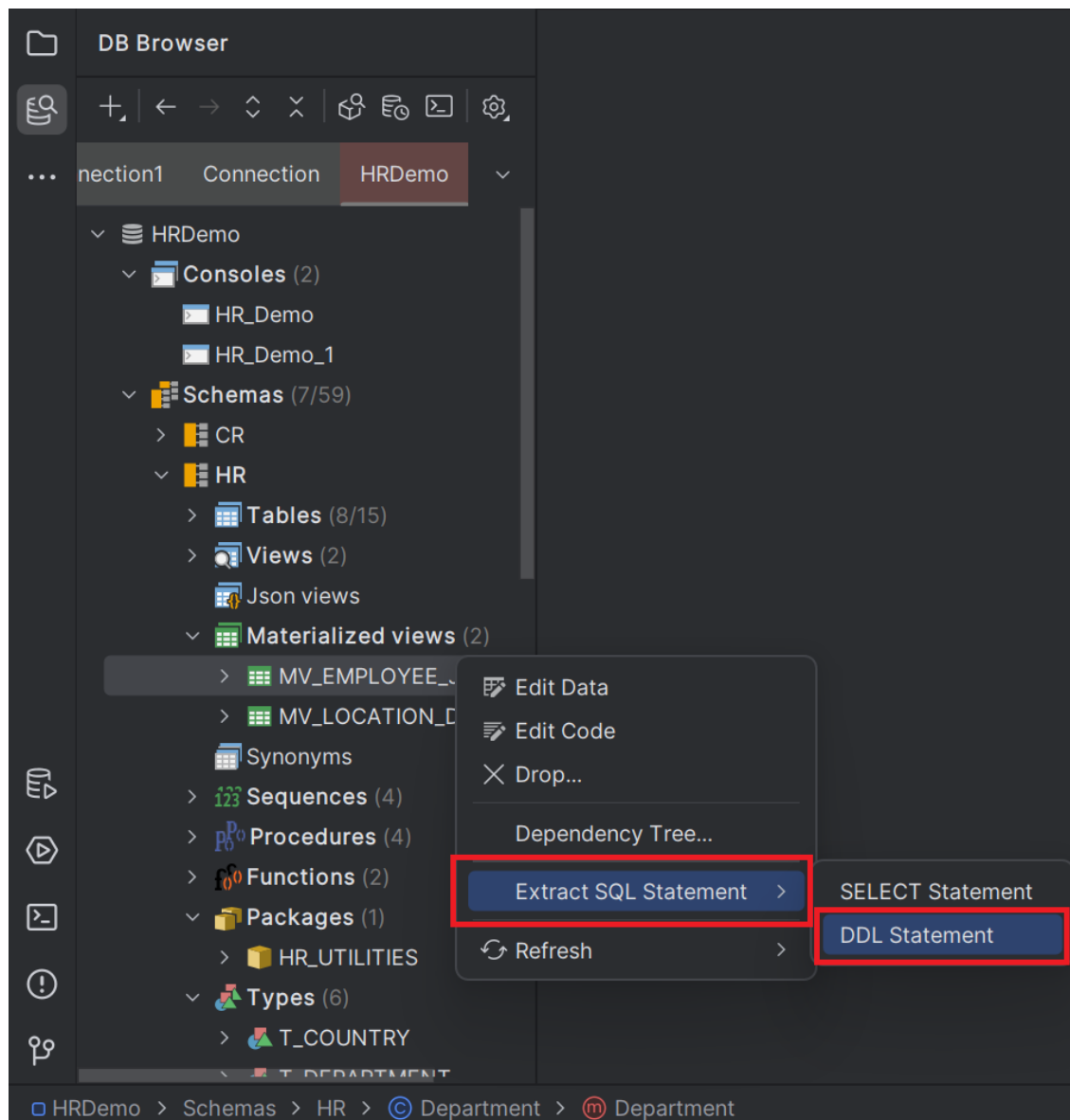
You can configure the following on the **DDL Files** settings window:

- File extensions for all data objects (such as Views, Functions, Procedures, Packages, etc.) that use DDL files for data interpretation.
- Extraction of DDL file(s) if associated with a data object
- Creation of DDL file and associate it with the corresponding data object (if attached DDL is not found)
- Synchronization of DDL files by:
 - re-running of DDL scripts in the SQL editor and/or
 - using qualified names for the database objects

DDL File Extraction

This topic provides an overview of extracting DDL scripts associated with database objects.

While viewing a data object on the DB Browser window of Oracle® Database Navigator, or having the object open in the editor window provides you the option to extract and view any associated DDL script file for that object. The **Extract DDL Statement** option for data objects opens the attached DDL script (if any) in the editor that you can view and edit.



Once the DDL statements for database objects are extracted to the clipboard (if available), you can utilize the DDL script in the following ways:

- Copy or save the DDL file in your project attaching to database objects.
- Open the DDL script file in the SQL editor for modification.
- View the exact structure of tables, indexes, views, and other objects created using the associated DDL commands.
- Use the DDL files for execution of methods and programs or use them with version control system for updating the code base for each build.

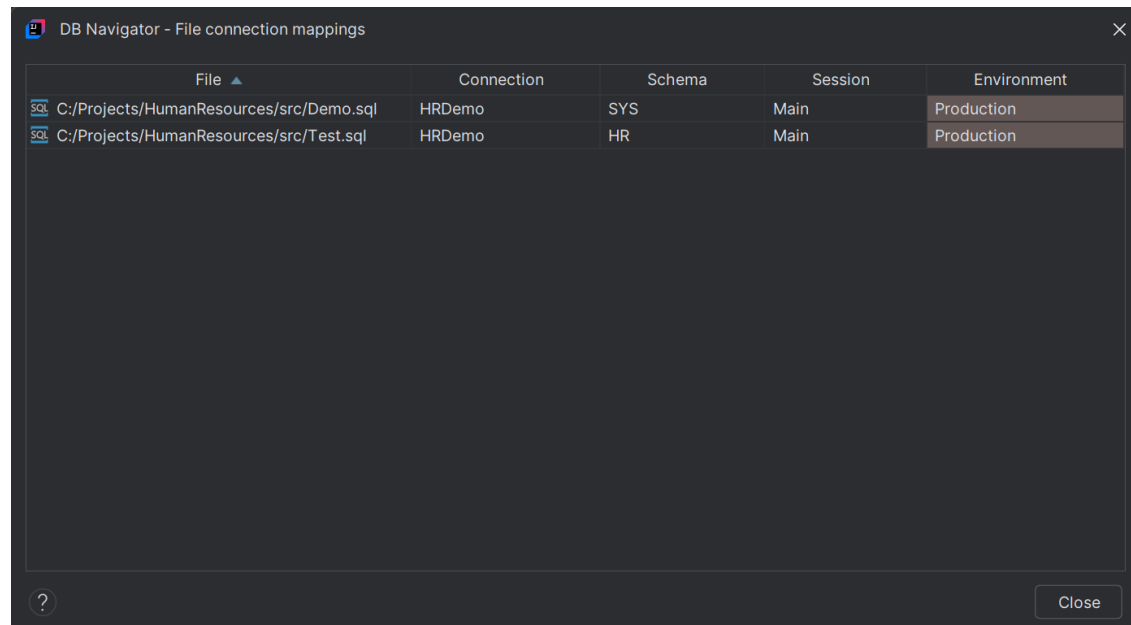
File Connection Mapping

This topic provides an overview of mapping local project files to database connections.

The association between your local project files and a database connection is established through **File Connection Mappings**. File connection mappings provide a database context for the SQL and PL/SQL files within your project, that defines which database connection, database schema and session within that connection, will be accessed when you edit or execute the file, by integrating your workspace with a database.

Use a file connection mapping if you need to differentiate users from each other at the database workspace level or if you need to direct them to separate database workspace.

To view the existing **File Connection Mappings** of your project files, from the Main menu of the Oracle® Database Navigator toolbar, select **DB Navigator > File Connection Mappings**.



The following information about the associated database are displayed for each file mapping:

Field	Description
File	the file path of the mapped SQL or PL/SQL file of your local project
Connection	the database connection which the files is associated
Schema	the database schema of the connection that the mapped file is accessing
Session	the session within the DB connection that the file is accessing
Environment	the specific database environment that the file is accessing

- [Creating File Connection Mappings](#)
This topic describes the procedure to build new file connection mappings.

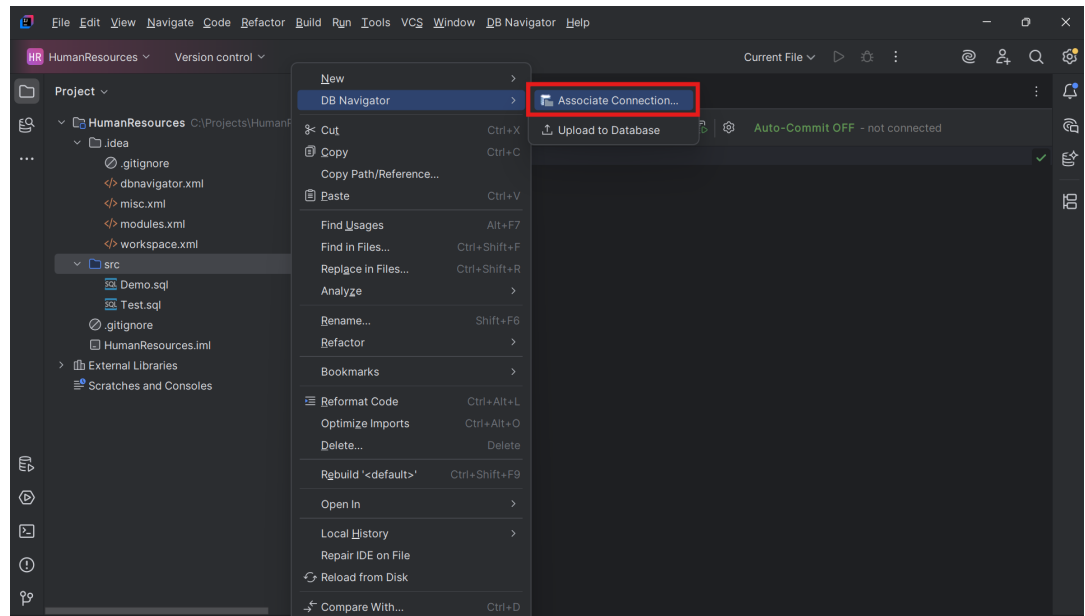
Creating File Connection Mappings

This topic describes the procedure to build new file connection mappings.

1. On your IDE platform, open the **Project** view in a separate pane to view the project folders.
2. Navigate to the project root folder (source folder) containing the required SQL files.

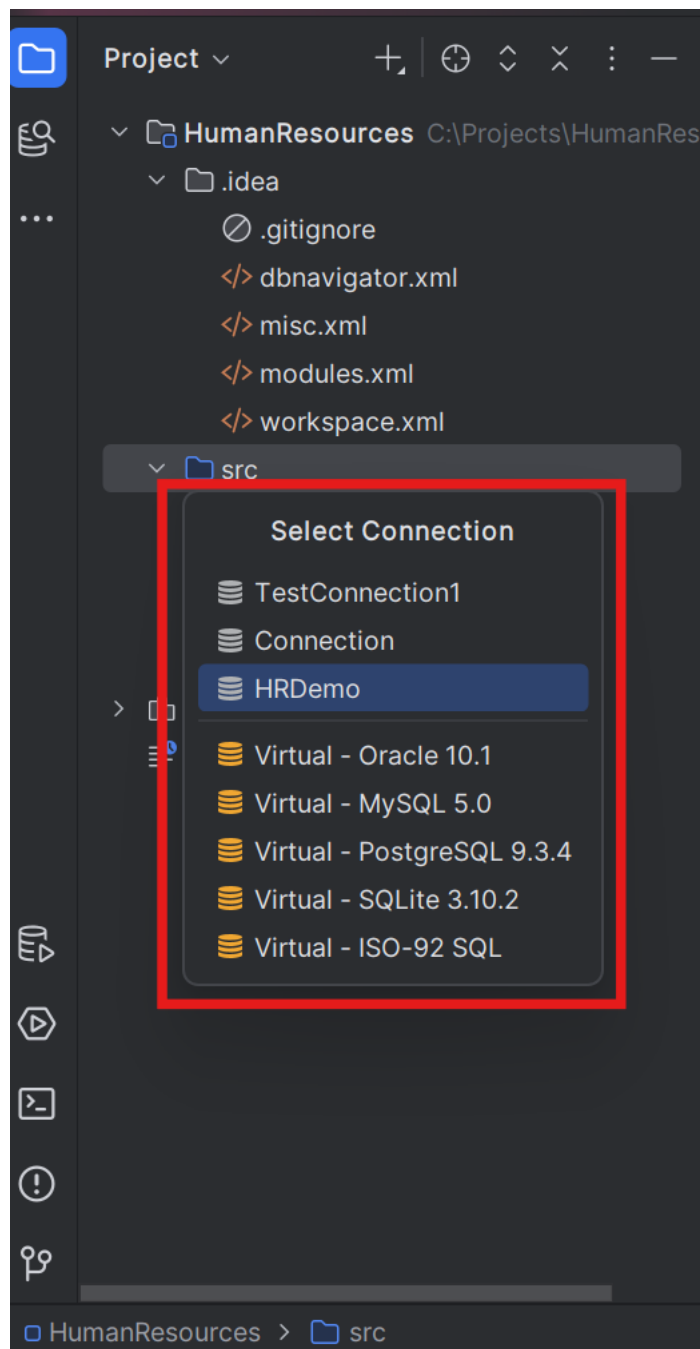
3. Right-click the project folder and select **DB Navigator > Associate Connection**.

By default, your local project and files are not associated with any database connection and defaults to "No Connection".



4. From the list of available DB connections that are displayed as options in the **Select Connections** list, select the connection to which the project should have access.

By default, all the files in the project will have access to the database connection to which the project folder is mapped.



5. To associate the SQL files in the project to a different database connection, open the file in the SQL explorer window.
6. From the toolbar menu, select the target:
 - DB connection that you want the file to access from the **Connection** drop-down list. All active and inactive DB connections display as options.
 - DB schema that you want the file to access from the **Schema** drop-down list. All available DB schemas display as options.
 - DB session that you want the file to access from the **Session** drop-down list. All available sessions in the DB connection display as options.

Note

If parent or root folder is already mapped to a DB connection, the default connection for the individual file (or sub-folders) is inherited from the parent project. If not, they default to "Connection". The connection you map for the individual file overwrites the inherited database context, if any.

7

Database Browser

This chapter provides an introduction to the Database Browser window of Oracle® Database Navigator.

The Database Browser (or DB Browser) is the main window within Oracle® Database Navigator plug-in that enables you to view and browse through the structure of connected databases and the objects within them.

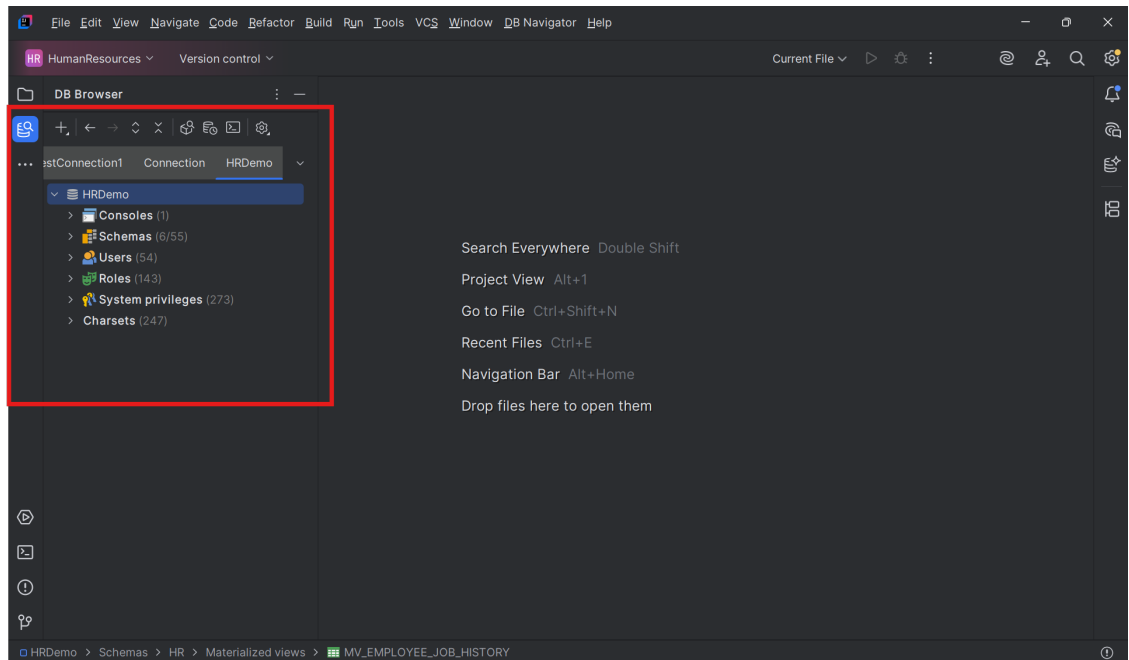
Topics:

- [Introduction to DB Browser Window](#)
This topic provides an overview of the database browser window and its features.
- [Database Views](#)
This topic describes the viewing modes available for database connections in the database browser window.
- [Database Objects](#)
This topic provides an overview of database objects that can be viewed in the DB Browser window.
- [Operations on Database Objects](#)
This topic provides an overview of operations performed on data objects.
- [Events Monitor](#)
This topic describes monitoring data changes in DB tables in Events Monitor window.

Introduction to DB Browser Window

This topic provides an overview of the database browser window and its features.

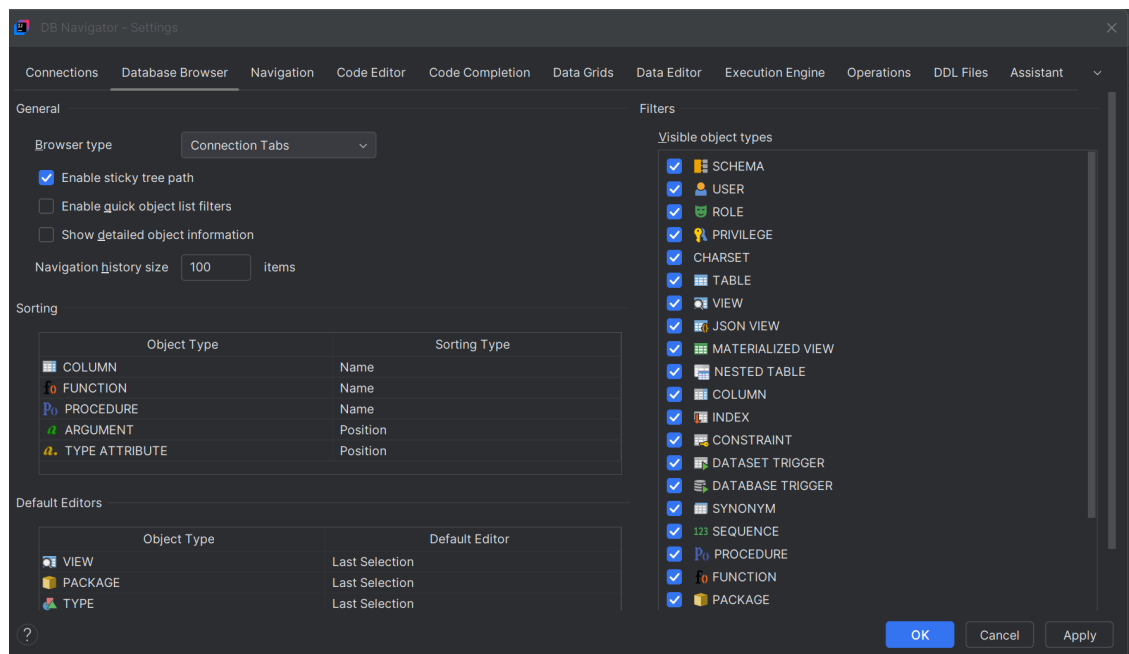
To open the DB Browser window on your IDE platform, from the Main menu of Oracle® Database Navigator select **View > Tool Windows > DB Browser** option. The DB Browser window opens, and the corresponding icon is displayed on the sidebar of the IDE interface. You may choose to dock and pin the DB Browser window or choose other View modes as per your preference.



You can perform the following tasks from the DB Browser window:

- Add new database connections.
- View all the database connections in desired Browser Type mode.
- View database objects in a tree structure for every connected database.
- Sort and filter specific databases objects that you want to view in the database.
- View details of each database object in Object Properties.
- Perform various operations on the database objects.
- Create or open existing SQL consoles to write and execute SQL statements.
- Open the session browser for connected databases to view session information.

To configure the **Database Browser** settings, from the Main menu of Oracle® Database Navigator, select **DB Navigator > Settings > Database Browser** tab.

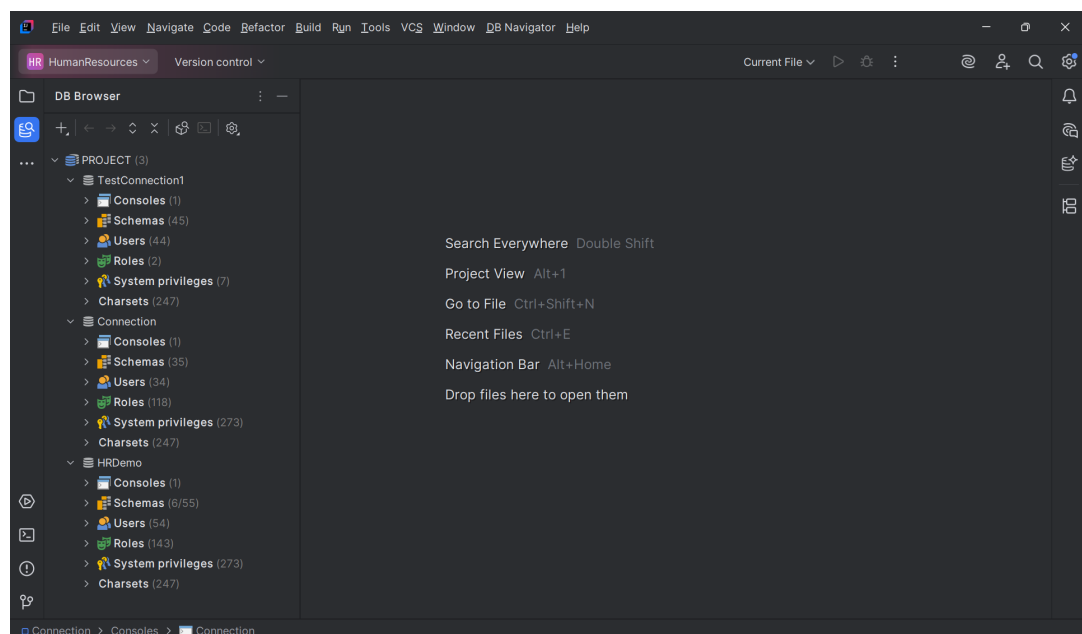


Database Views

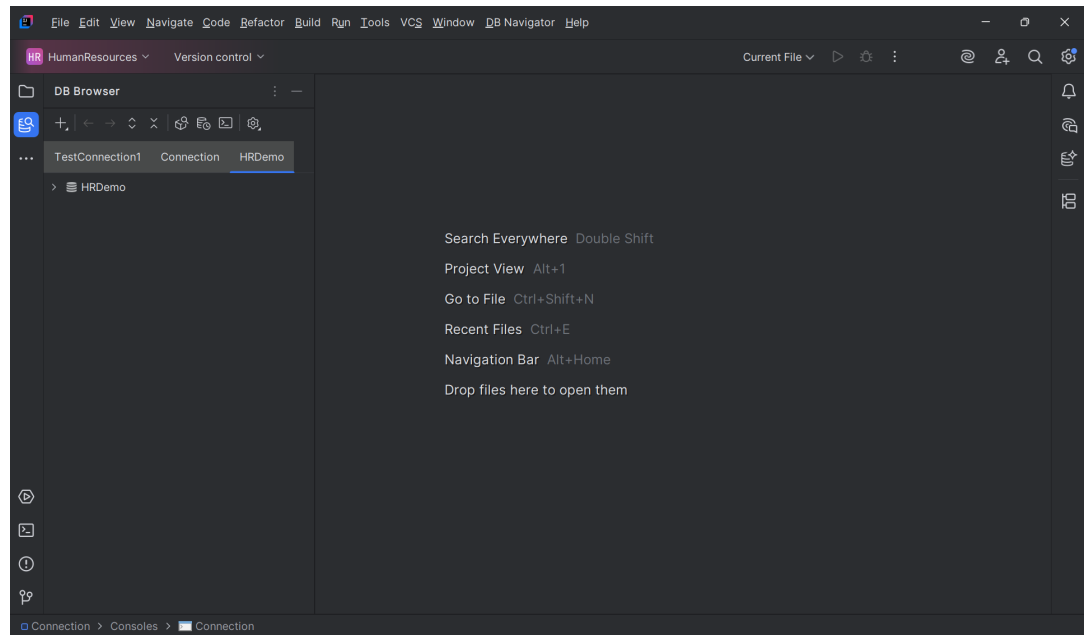
This topic describes the viewing modes available for database connections in the database browser window.

The **Database Browser** window primarily displays the database connections and the database objects, including their count and status within the connected databases. The connected databases and their objects are presented in a tree structure. Oracle® Database Navigator supports the following database views that you can configure from the **Browser Type** settings:

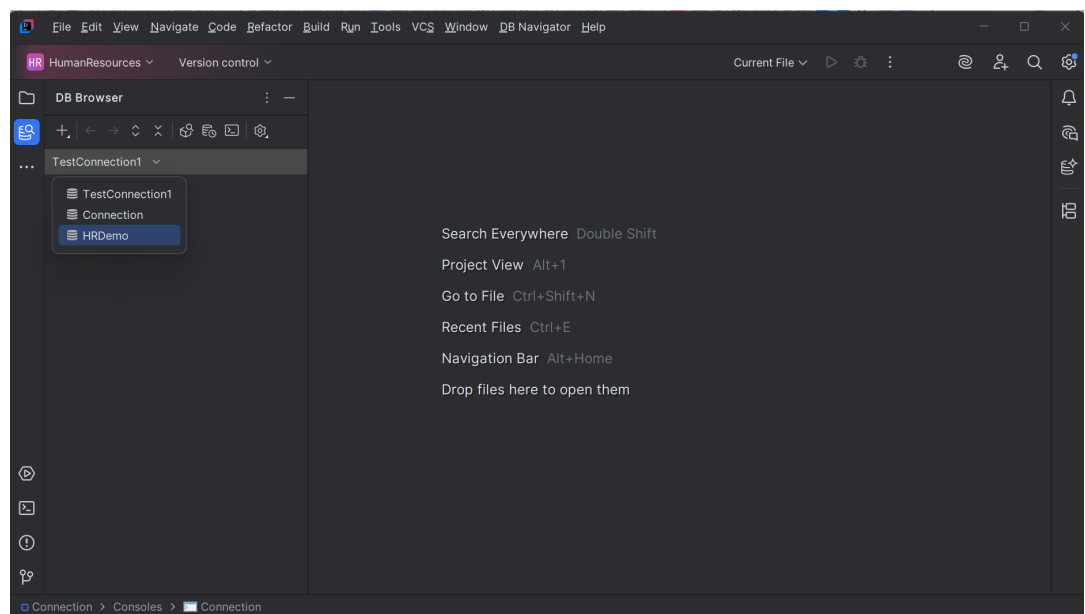
- Single Tree



- Connection Tabs (default view)



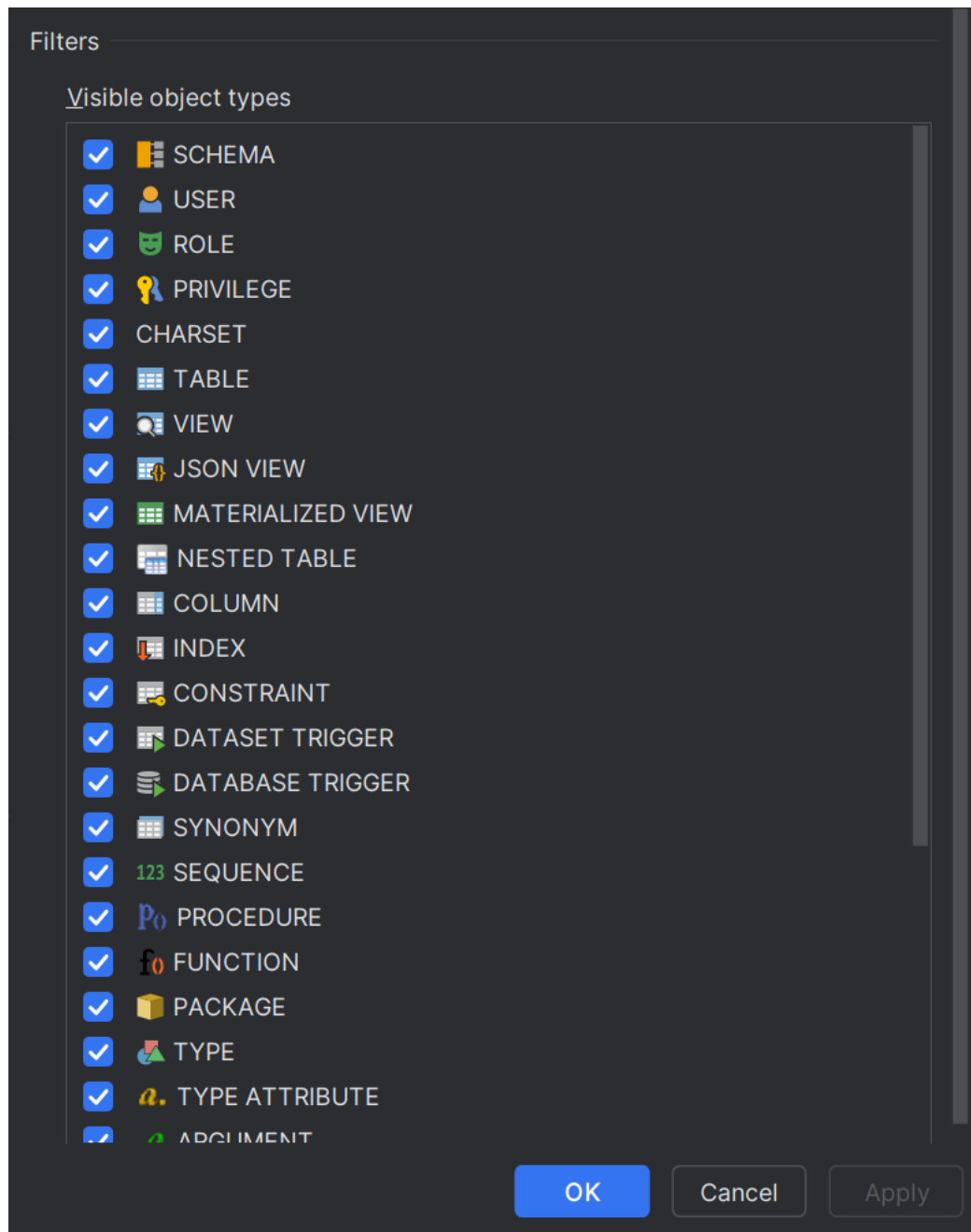
- Connection Selection



Database Objects

This topic provides an overview of database objects that can be viewed in the DB Browser window.

The **Database Browser** window displays the hierarchical structure of database objects for every individual connection. You can filter and select the type of database objects you want to view in the database structure from **Database Browser** settings.



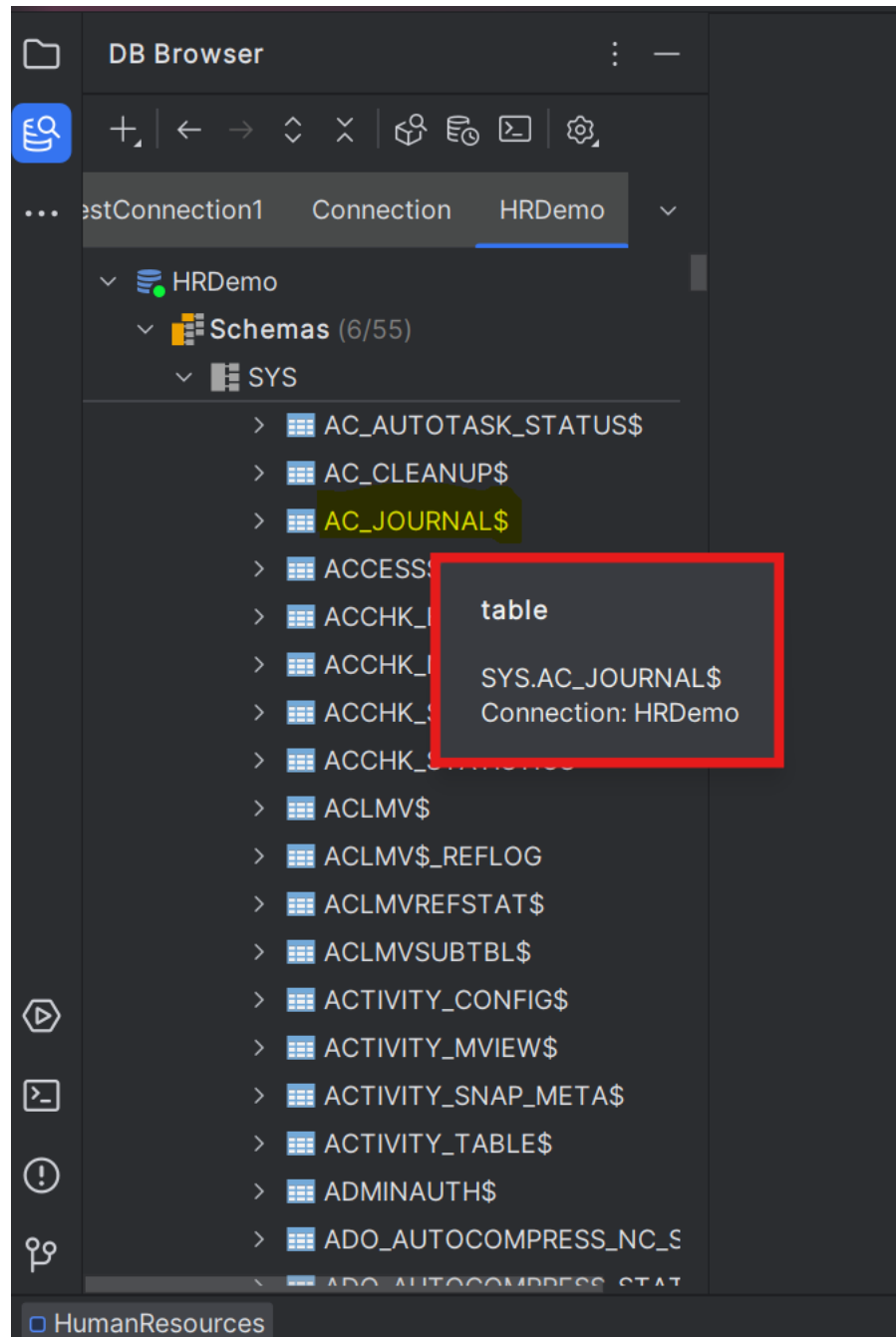
Database object types that can be viewed are as follows:

- Consoles
- Schemas
 - Tables
 - * Columns
 - * Constraints

- * Indexes
 - * Triggers
 - * Nested Tables
- Views
 - * Columns
 - * Constraints
 - * Triggers
- Json views
- Materialized views
 - * Columns
 - * Constraints
 - * Indexes
 - * Triggers
- Synonyms
- Sequences
- Procedures
 - * Arguments
- Functions
 - * Arguments
- Packages
 - * Procedures
 - * Functions
 - * Types
- Types
 - * Attributes
 - * Procedure
 - * Functions
- Java classes
 - * Fields
 - * Methods
 - * Inner Classes
- Triggers
- Java resources
- Dimensions
- Clusters
- Database links
- Credentials
- AI Profiles

- Users
- Roles
- System privileges
- Charsets

You can set the maximum **Navigation History Size** to view items at a time in the DB tree structure. Selecting or hovering the cursor over a database object in the browser displays its details in the object details widget below. You can enable/disable this widget setting using the **DB Navigator - Settings** window > **Database Browser** > **Show detailed object information** check box.



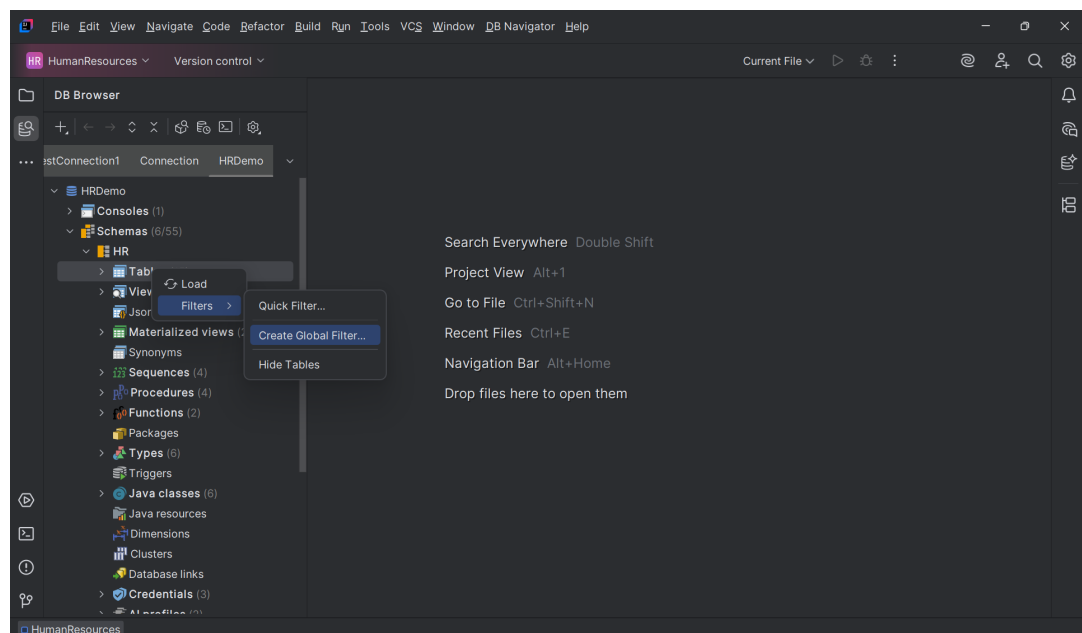
- [Creating Global Filters for Data Objects](#)
This topic explains filtering data object types in the DB Browser window.
- [Default Editor Views for Object Types](#)
This topic describes the viewing modes available for different object types.

Creating Global Filters for Data Objects

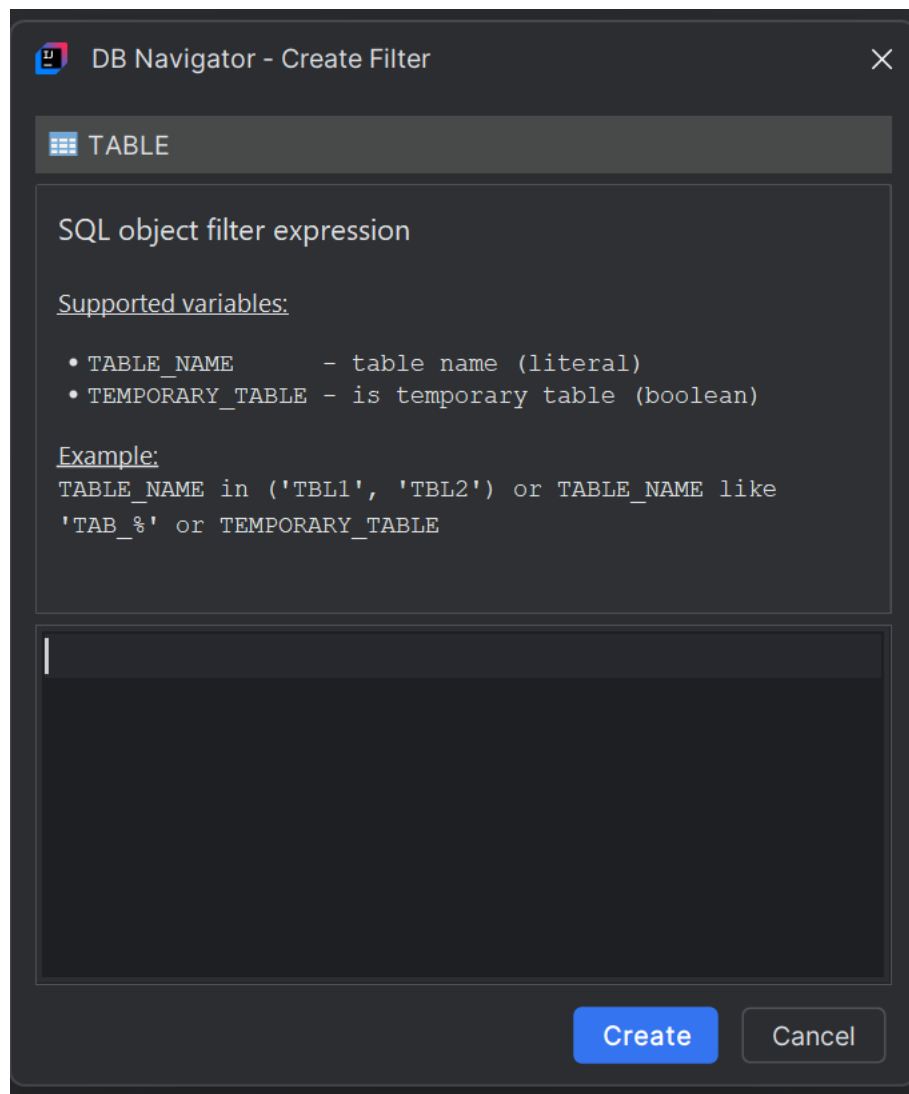
This topic explains filtering data object types in the DB Browser window.

To view specific data objects for a connection, you can create and apply global filters to limit the objects displayed on the DB Browser window. Follow these steps to create and apply **Global Filters**:

1. Right-click on the specific object type and click **Create Global Filters**.



2. In the **Create Filter** window, enter the filter criteria.



3. Click **Create**.

The new filter gets added to the list of existing filters for you to select and apply to the database table.

Example: To view specific schemas in a database connection, right-click to open the context menu for Schemas and select **Filter > Global Filter**. Enter the following in the **Create Filter** window and click **Create**:

```
SCHEMA_NAME in ('SYS', 'SYSTEM', 'DCI', 'SH', 'HR')
```

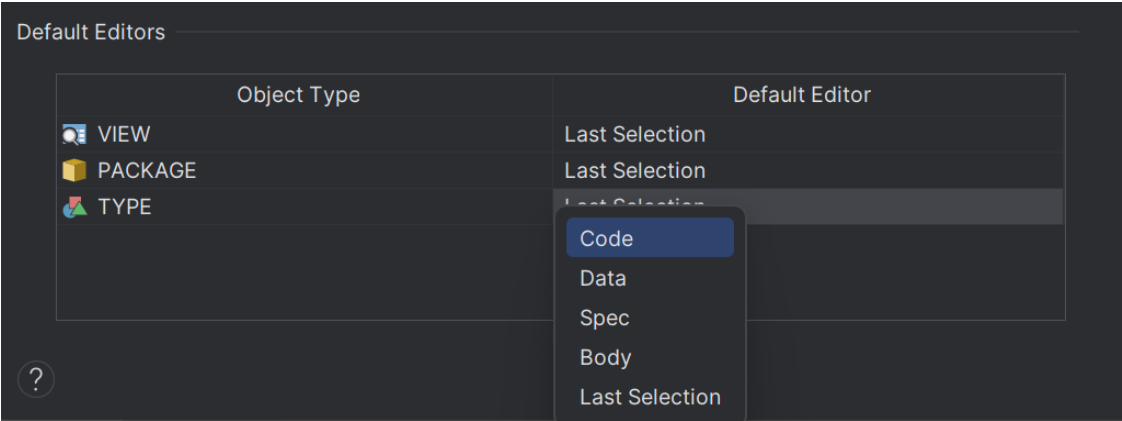
The list of database Schema in the connection will display only the filtered items.

After a global filter is created and applied, you can edit the filter criteria, hide the filter from the list of available filters or delete the filter.

Default Editor Views for Object Types

This topic describes the viewing modes available for different object types.

For each database object type, you can set the **Default Editor** type to view and perform operations on the objects.



The available **Default Editor** modes are as follows:

Default Editor	Description	Applicable for Object Type
Last Selection	remembers and opens the editor mode in which you last opened the DB object.	- Views - Materialized Views - JSON Views - Packages - Types
Code	displays the SQL script or query in the editor window.	- Views - Materialized Views - JSON Views
Data	displays the table data in the form of rows and columns.	- Views - Materialized Views - JSON Views
Spec	displays the code specification of the package or type.	- Packages - Types
Body	displays the code body of the package or type.	- Packages - Types

Additionally, you can sort the object types to display them based on their **Name** or **Position** in the DB tree structure.



Operations on Database Objects

This topic provides an overview of operations performed on data objects.

Oracle® Database Navigator tool allows you to perform various operations on the database objects visible in the DB Browser window. The operations you can perform depends on the type of object. The following table lists the operations you can perform on common DB objects:

Object Type	Operations
Schemas	- View list of schemas within the DB connection - Reload the DB schema to display updated list of schema and schema content - Hide specific schemas from the DB structure - View schema users - Apply Global filters to view specific schemas or schema objects
Tables	- View list of DB tables within each schema - Reload the table to get updated table structure and refresh object status within the table - Hide specific tables in the DB structure - Apply Global filters to view specific tables or table objects - Edit table data - Extract SQL statements including DDL statements for the table and copy to clipboard - View table indices - View object dependency tree of a table with the list of incoming and outgoing reference tables - Start or Stop Notifications for Data Changes
Nested Tables	- View and hide nested tables within DB tables - Apply Global filters to view specific nested tables within tables - Reload to fetch the updated list of nested tables and their objects in the connected database
Columns	- View the columns in each DB table or view - Apply Global filters to view specific columns or filter data in the columns - Hide any column including pseudo columns and columns marked for audit from DB views - Extract the SQL statements for the columns and copy to clipboard
Users	- View list of users accessing the connected DB - View the database schemas accessible to different DB users - View current status of users - Apply Global filters to view specific users in the DB structure - View user' roles and granted privileges
Roles	- View list of user roles created in the connected DB - View the users granted a particular role (user grantee) - View the privileges and specific permissions granted to the role - Refresh list of roles in the DB structure or reload individual role to fetch updated role info
System Privileges	- Apply Global filters to view specific privileges in the DB structure - View the DB users that are assigned a specific privilege - View the user roles that are assigned a specific privilege - Reload the list of privileges and their user and role grantees within the DB structure
Charsets	- Apply Global filters to view specific character sets within a DB structure - Reload to fetch the updated list of charsets or individual charset definition in the connected DB

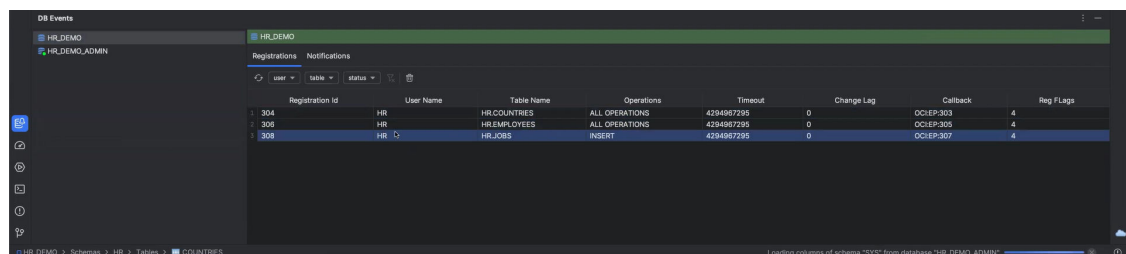
Object Type	Operations
Views	- Edit the View data in the editor Data tab - Edit the SQL query for the View in the editor Code tab - Delete the DB View - View the object dependency tree for the View with the list of incoming and outgoing reference tables - Extract SQL statements from the View query
Constraints	- View the table level, view level and column level constraints within the DB structure - Apply Global filters to view specific constraints in the table or column - Reload the constraints to fetch updated list of constraints or constraint definition
Functions	- Create and apply Global filters to view selected DB functions - Reload to fetch the updated list of DB functions - Hide the functions from object view
Triggers	- Apply Global filters to view specific triggers within the database table - Hide the triggers from the DB structure - Reload to fetch the updated list of triggers within the database table
Indexes	- View the columns and datasets of an index - Drop the index from the connected database - Extract SQL and DDL statements and copy to clipboard - Reload to fetch the updated list of indices in the connected database - Refresh the object status of the index
Packages	- Edit the package code in DB editor - Compile the package in regular or debug mode. You can also compile the invalid objects of the package - Run and debug the package. You will be prompted to select the method to execute and debug the package - View the dependency tree with list of incoming and outgoing references - Extract SQL statements including DDL statement and copy to clipboard - Reload packages to fetch the list of packages in the DB connection - Refresh the status (Valid/Invalid) of package objects
Procedures	- Create and apply Global filters to view specific DB procedures - Reload to fetch the updated list of DB procedures - Hide the procedures from object view
Types	- Open the data types in editor to make changes to the code - Compile the data type in regular or debug mode. You can also compile the invalid objects in the data type - Run and debug the data type. You will be prompted to select the method to execute and debug the data type - View the object dependency tree with list of incoming and outgoing references - Extract SQL statements including DDL statement and copy to clipboard - Reload the data types to fetch the list of updated types in the DB connection - Refresh the status of the data types
Arguments	- Reload arguments to fetch the updated list of arguments within DB objects - Apply Global filters to view specific arguments - Hide arguments within the DB structure

Object Type	Operations
Java Classes	- Open the source code in editor and make changes to the Java class file or Java source file - Run, compile (including invalid objects) and debug the Java program - Create and load new Java classes in the schema - Create custom execution wrapper for executing Java programs - View the object dependency tree with the list of incoming and outgoing references - Download Java classes to the DB schema of your project - Upload Java classes (or Java source files) in database schemas - Drop Java class files (and Java methods) or Java source files from the schema
Java Resources	- View and hide Java resources - Edit Java resource source code in Java editor - Drop Java resource files - Download the Java resource from Java class or JAR files to your project - Upload Java resources in database schema - Apply Global filters to view specific Java resources - Reload to fetch the updated resources in the class
Dimensions	- View and hide dimension tables - Apply Global filters to view specific dimension tables within the DB schema
Clusters	- View or hide database clusters within the connected database - Reload to fetch the updated list of database clusters - Apply Global filters to view specific clusters within the connected database
Credentials	- View or hide credentials (digital key) within each database schema - Reload to fetch the updated list of DB credentials - Apply Global filters to view specific credentials within the connected DB schema

Events Monitor

This topic describes monitoring data changes in DB tables in Events Monitor window.

The **Database Events (DB Events)** window displays details of database events that are triggered on Oracle database connections when some changes are made to the data in a DB table. To open the **Events Monitor** window for a database connection, from the Main menu of Oracle Database Navigator toolbar, select **DB Navigator > Events Monitor**. The **DB Events** window is displayed listing all the connections on the left pane.



If you enable the option to **Notify Data Changes** (from the context menu of the table in DB Browser window) for any database table, an "event listener" must be registered. While registering the listener, you have the option to select the operations for which you want to be notified, such as, Insert, Update, and Delete. The real-time notification received are part of

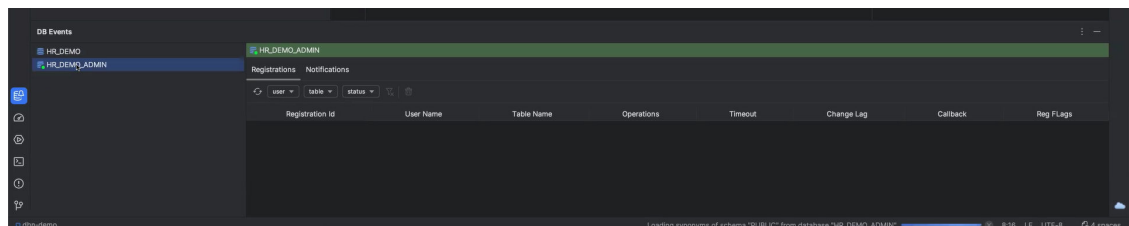
Oracle's Continuous Query Notification feature. For more information on the notification mechanism, see [Continuous Query Notification](#).

Note

Oracle® Database Navigator currently supports monitoring data changes in database Tables and not modifications in SQL queries. Also, only one table can be monitored at a time for a given listener registration.

Once the registration is successfully done for the listener code, the Registration tab of the DB events window displays the following details:

- **Registration ID** - Registration number for the listener registration you created in order to enable notifications for data changes.
- **User Name** - The username for which the registration is being created.
- **Table Name** - The name of the database table for which the registration is created to enable notifications on data changes.
- **Operations** - The type of operations (Insert, Update, Delete or All Operations) that caused the change event.
- **Timeout** - Time duration in seconds after which the registration is automatically expunged and the notification is timed out.
- **Change Log** - Any changes captured in the listener registration.
- **Callback** - If the notification type is using the Oracle Call Interface (OCI), the notification handler is a client-side C callback procedure. Displays the name of the PL/SQL procedure to be executed when a notification is generated (a notification handler). You must specify the name in the form `schema_name.procedure_name`, for example, `hr.dcn_callback`.
- **Red Flags** - Displays one or more quality-of-service flags, which are constants in the `DBMS_CQ_NOTIFICATION` package.



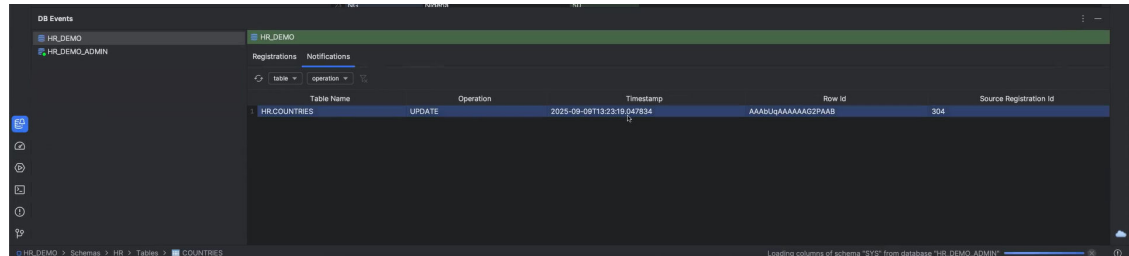
To narrow-down the listed registrations, you can use the Filter drop-down fields based on the following filter criteria:

- **User** (name of the user that created the registration)
- **Table** (table name corresponding to the listener registration)
- **Status** (current status of the registration - Listening or Not Listening)

The notifications are received in response to changes made in the registered database table. For every change, a new row is added in the Notifications tab of the DB Events window, and the following details about the data change are displayed:

- **Table Name** - The name of the database table in which the data has changed.

- **Operation** - The type of operations (Insert, Update, Delete or All Operations) that will be tracked for receiving notifications.
- **Timestamp** - The date and time when the data was changed.
- **Row ID** - The database table row identifier in which the data has been changed.
- **Source Registration ID** - The registration number for the listener registration created to track the data changes and receive notifications.



The screenshot shows the 'DB Events' window with the 'Registrations' tab selected. A table of notifications is displayed with the following columns: Table Name, Operation, Timestamp, Row Id, and Source Registration Id. One notification is listed for the HR.COUNTRIES table with an UPDATE operation at timestamp 2025-09-08T13:23:19.047834, with Row Id AAADuqAAAAAG2PAAB and Source Registration Id 304.

Table Name	Operation	Timestamp	Row Id	Source Registration Id
HR.COUNTRIES	UPDATE	2025-09-08T13:23:19.047834	AAADuqAAAAAG2PAAB	304

To narrow-down the listed notifications, you can use the **Filter** drop-down fields based on the following filter criteria:

- **Table** (table name in which the data has changed triggering the notification)
- **Operation** (database operation that triggers the event including insert, update, or delete)
- [Enabling Notification for Data Change](#)
This topic describes the procedure for enabling/disabling notifications for data change operations that occur in database tables.

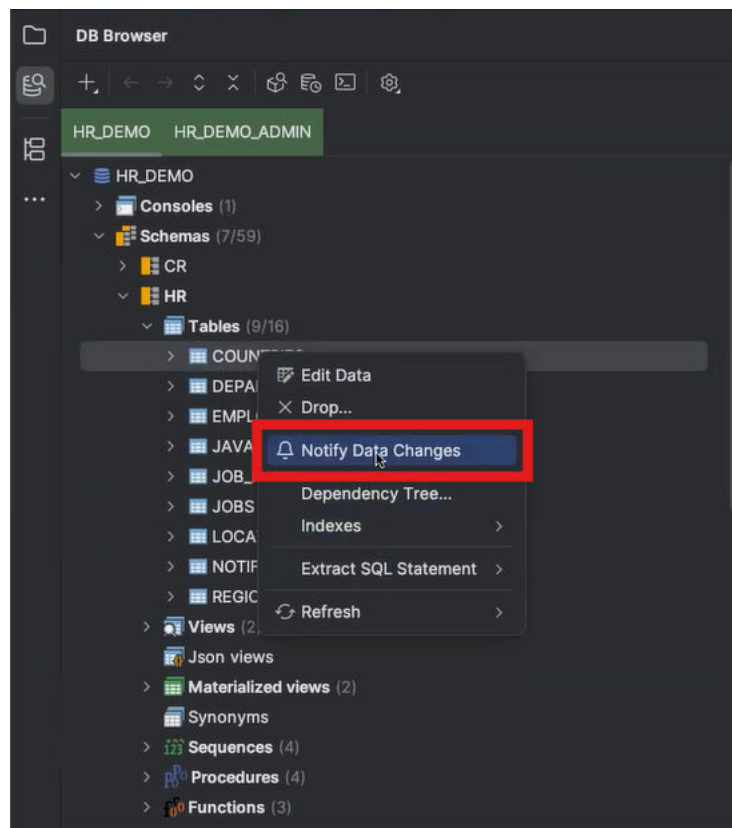
Enabling Notification for Data Change

This topic describes the procedure for enabling/disabling notifications for data change operations that occur in database tables.

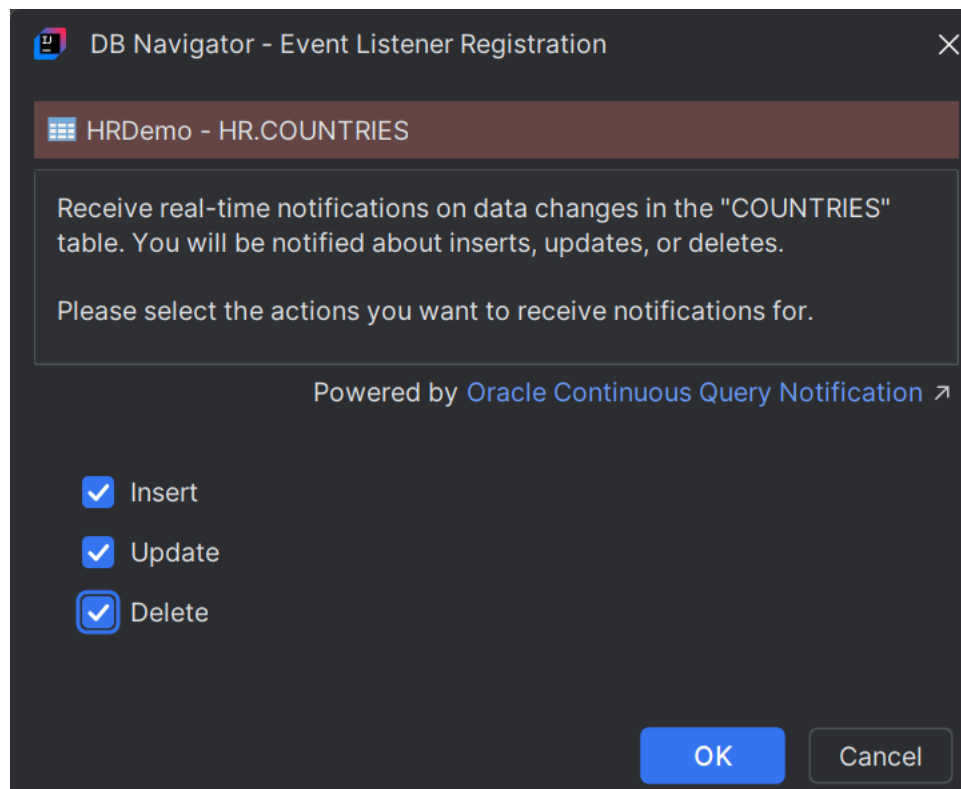
Enabling notifications for a database table to capture the events triggered by activities such as insertion, modification, and deletion requires creating a listener to that table. You must have required system privileges to enable notifications on a DB table.

To enable notifications for data change in DB tables:

1. Open the database schema in the **DB Browser** window and right-click the database table for which you want to enable the data change notification.



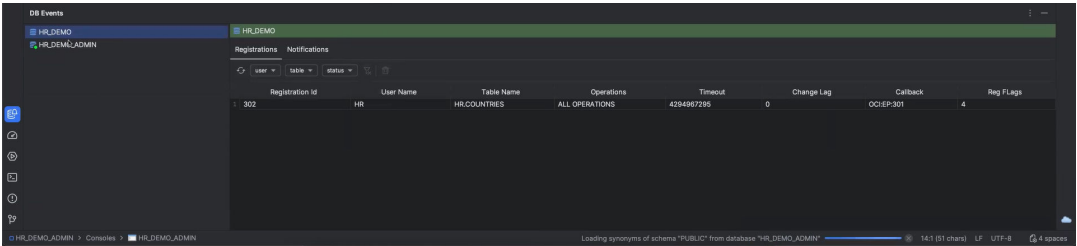
2. From the context menu select the **Notify Data Change** option. The **DB Navigator - Event Listener Registration** dialog box opens.



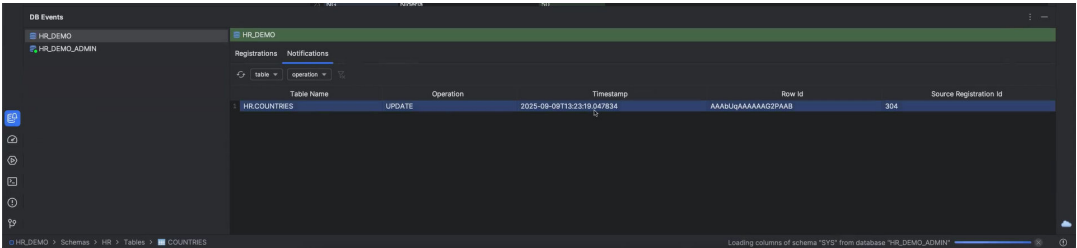
The listener can be registered only for one database table at a given time.

- 3. Select the check boxes for the operations that should trigger data change events for monitoring and receiving notifications. Options include **Insert**, **Update** and **Delete**.
- 4. Click **OK**.

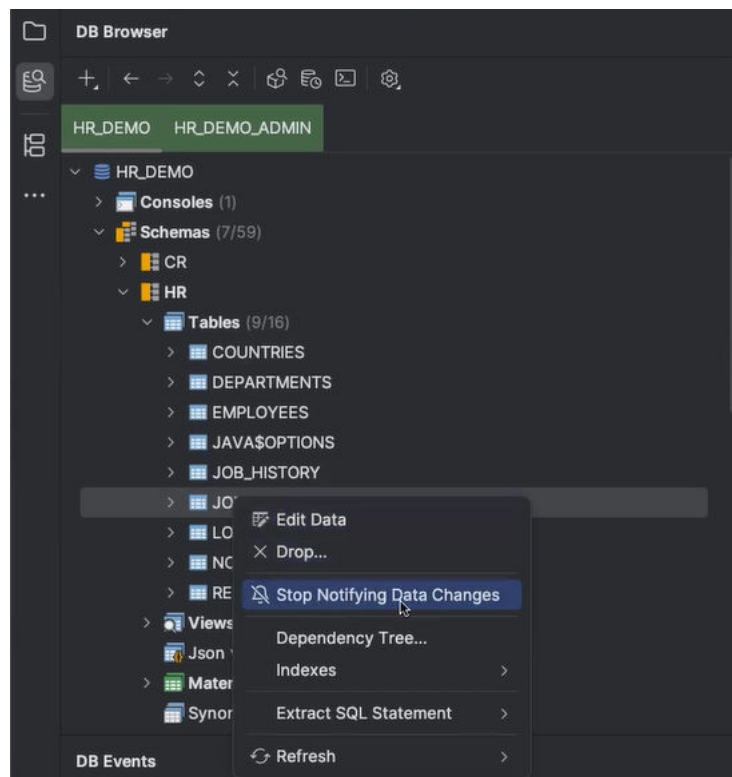
A new listener registration is successfully created, and its corresponding details is displayed on the **Registration** tab of the **DB Events** window.



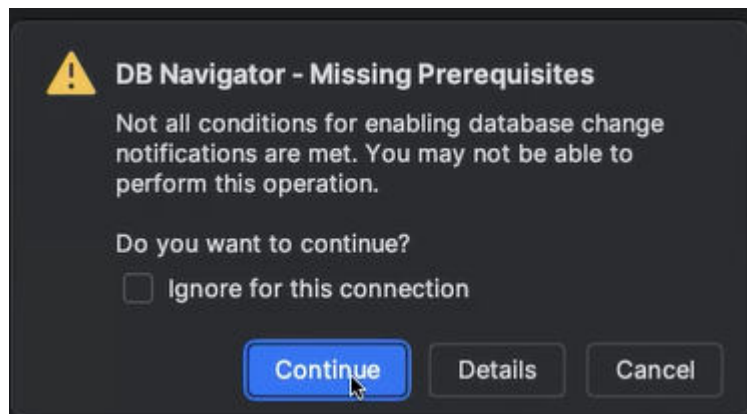
Events corresponding to every data change that takes place in the DB table whenever any one of the selected operations is performed now gets monitored. The **Notifications** tab of the **DB Events** window lists the notifications for all such events.



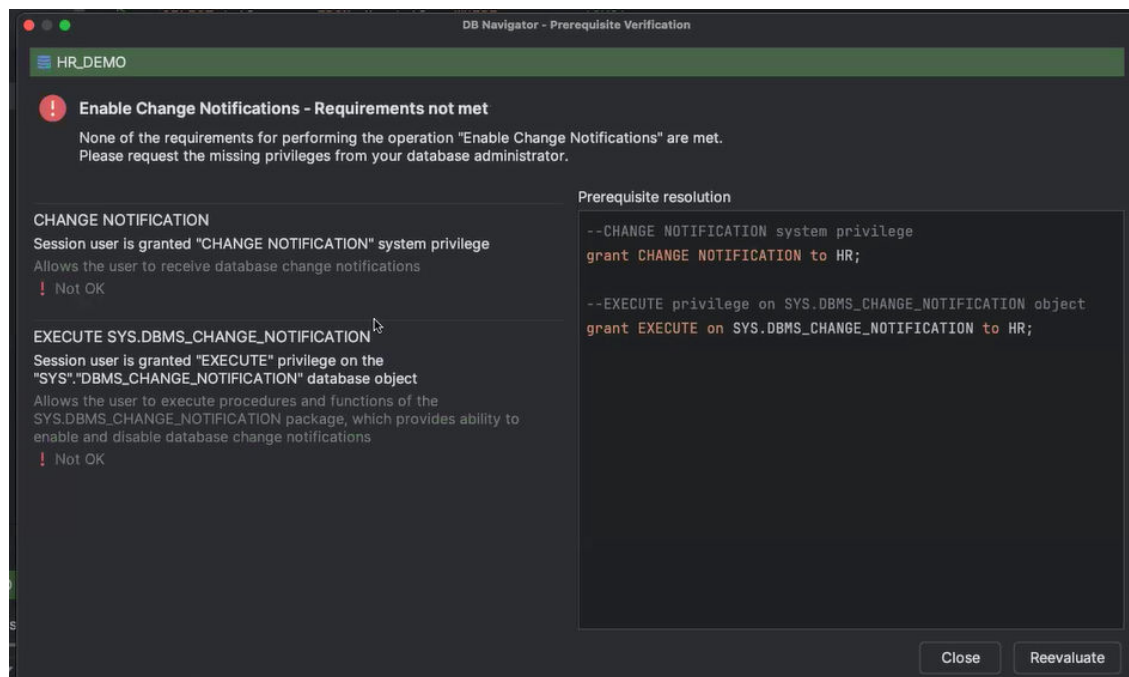
To stop the notifications, from the context menu of the database table where notification are currently enabled, select the **Stop Notifying Data Changes** option.



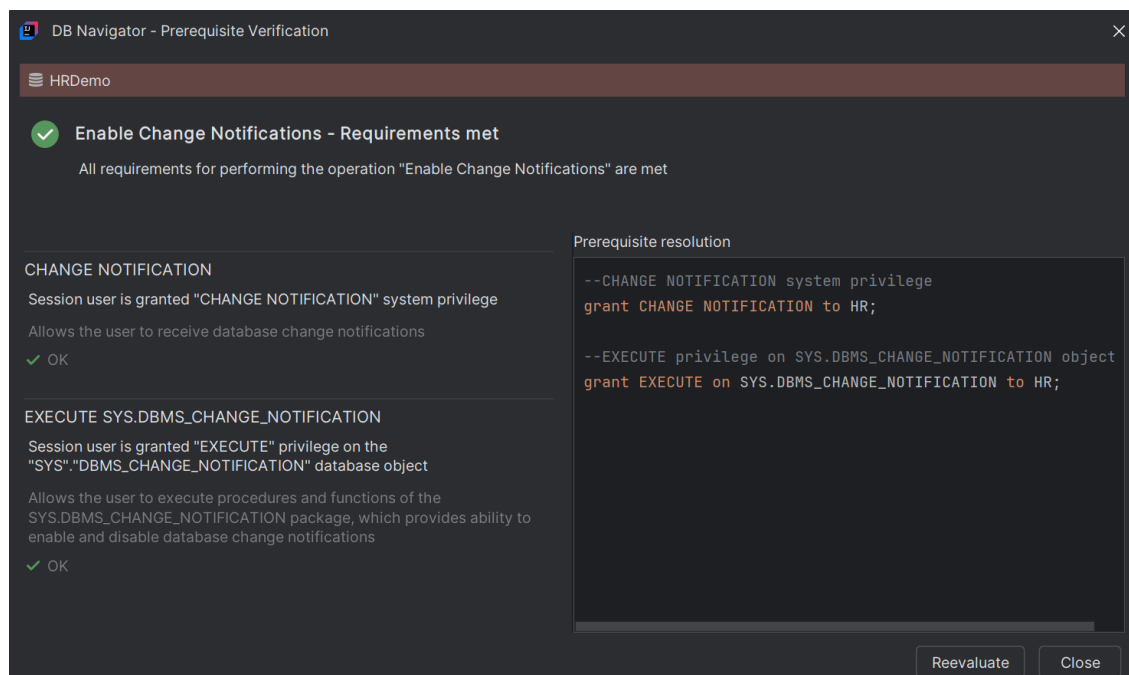
In case, sufficient privileges are not met for creating a listener registration for the DB table, the **DB Navigator - Missing Prerequisites** dialog opens when you select the **Notify Data Change** option for that table.



If you click **Continue**, the "Pre-requisite resolution" is presented in the **DB Navigator - Prerequisites Verification** dialog box.



The mentioned privileges must be provided to the user by the database administrator for a database connection before proceeding with the creation of a listener registration. If all the requirements are met, the same is displayed on the **Prerequisite Verification** dialog box.



8

Data Viewers and Editors

This chapter provides an introduction to various data viewers and data editors in Oracle® Database Navigator.

Oracle® Database Navigator provides data viewing and data editor features for database tables, views and materialized views. Both the Data Viewer and Data Editor windows open either in:

- the **Data** tab where you can view and edit the database Tables, Views and Materialized Views, or
- the **Results** tab which displays on the DB Console window when you run an SQL statement.

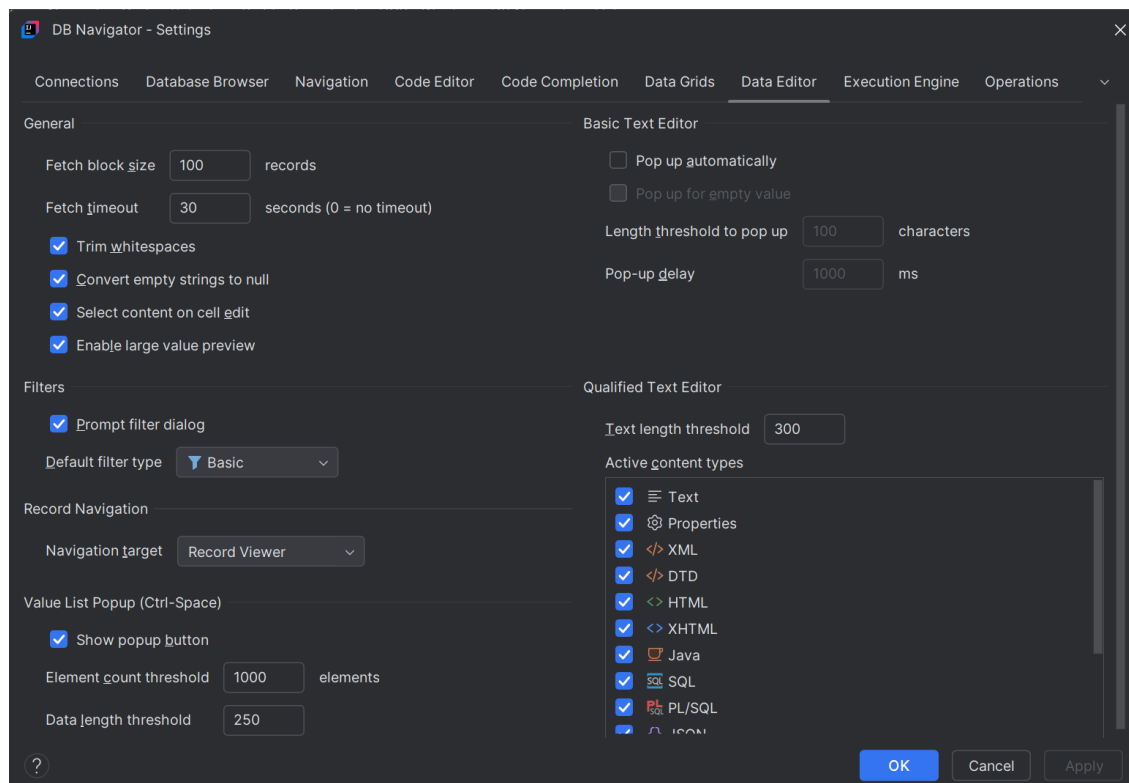
Topics:

- [Data Editor Settings](#)
This topic provides an overview of the settings to configure Data Editors.
- [Data Grid Settings](#)
This topic provides configuration information of data grids of Data Editors.
- [Data Viewers](#)
This topic provides an overview of Data Viewers for different data object types.
- [Table Editors](#)
This topic provides an overview of the table editor features.
- [Text Editors](#)
This topic provides an overview of the text editors available in the Database Navigator plug-in.

Data Editor Settings

This topic provides an overview of the settings to configure Data Editors.

To control how you would view and edit table (or views and materialized views) data in the Data Editor window, from the Main menu of the Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Data Editor** tab.



You can configure the following Data Editor settings:

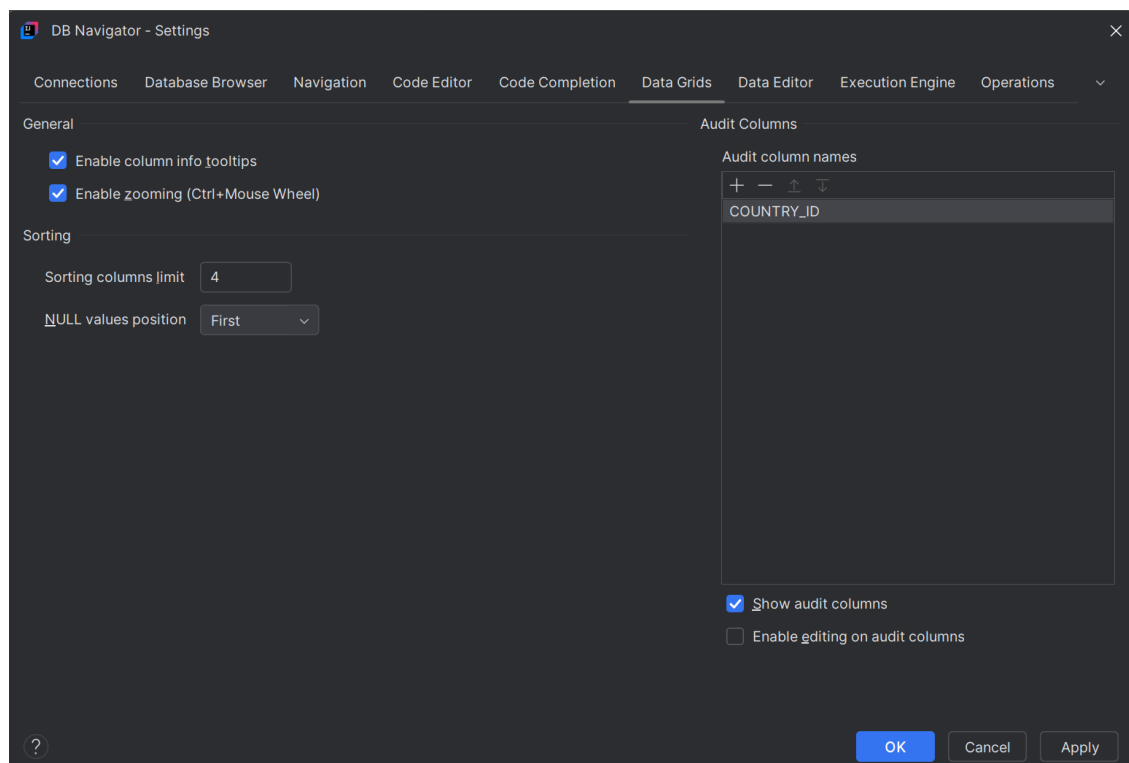
Setting Options	Configurations
General	- Maximum number of records that is fetched from the database at a time in a given data block for the object you are viewing - Maximum time allowed to fetch the block of records from the database before timeout - Automatically trim whitespaces for literal content upon editing the data - Convert empty strings in the table/views to null values - Enable selection of cell content upon editing - Enable pop-up to display the entire cell values that do not fit within the column width on hovering over the cell
Filters	Filter table contents by a column or by a specific cell value. Enable the default filter type to be one of the following: - Basic filter that lets you add conditions (And/Or) to the table columns and create filters - Custom filter that lets you create filters with custom SQL queries
Record Navigation	Configure the default navigation to jump to either of the following: Record Viewer - directly opens the Record Viewer dialog box to display details of the record Table Editor - directly navigates to the Table editor window Ask - a confirmation message is displayed asking whether you want to navigate to the Record Viewer dialog or to the Table Editor window.
Value List Popup	Enable the value list icon for table columns when editing the records. Clicking the icon displays the list of possible values only for those columns for which you configure the following criteria: - columns having a certain number of maximum possible values - columns having a certain data length; for example, column of data type VARCHAR with maximum data length of 30 characters.

Setting Options	Configurations
Basic Text Editor	• Enable displaying the icon to open the text editor for columns to edit the record • Enable opening the text editor for table cells that have empty records • Configure the maximum character length that you can edit in the text editor that opens for a record
Qualified Text Editor	• Configure the maximum character length that you can edit in the qualified text editor that opens for a record • Configure the type of qualified text editor that enables you to edit certain content type/file formats

Data Grid Settings

This topic provides configuration information of data grids of Data Editors.

Data Grids in table editors help in the display, organization, manipulation and retrieval of data represented in a tabular form. There are separate settings for configuring the data grids in the Database Navigator plug-in editor windows. To access the **Data Grid** settings, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Data Grids** tab.



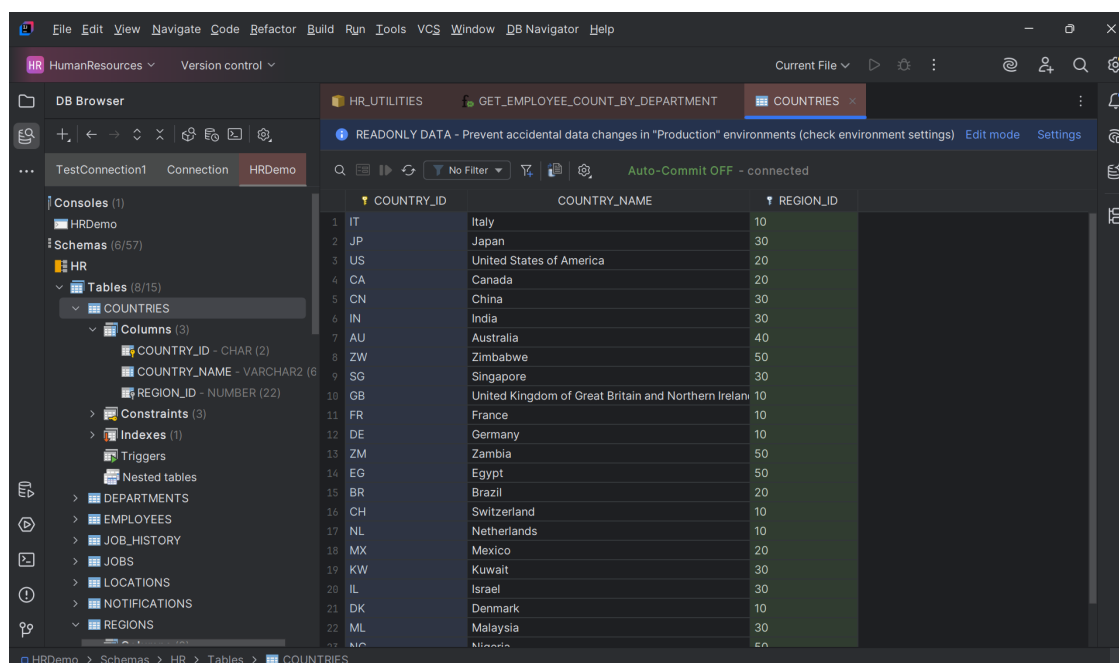
Setting Options	Configurations
General	- View column information in the form of tool tips by hovering the cursor over the column header or cell - Use the keyboard shortcut (CTRL + mouse wheel) to zoom in on a cell value
Sorting	- Enable the maximum limit of columns that can be sorted in a table - Configure sorting by position (First or Last) of Null values in the column
Audit Columns	- Add or remove column names to use for auditing - Enable an indicator for columns used for auditing in database logs - Enable editing columns used for auditing

Data Viewers

This topic provides an overview of Data Viewers for different data object types.

Database objects including Tables, Views, and Materialized Views open into the data editor window pane where you can view their data in a tabular form and also make edits. Following are the sample data viewers for different object types:

Data Viewer for Database Tables



Data Viewer for Database Views

DEPARTMENT_ID	DEPARTMENT_NAME	LOCATION_ID	STREET_ADDRESS	CITY	STATE_PROVINCE	POSTAL_CODE	COUNTRY	COUNTRY_NAME
10	Administration	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
20	Marketing	1800	147 Spadina Ave	Toronto	Ontario	M5V 2L7	CA	Canada
30	Purchasing	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
40	Human Resources	2400	8204 Arthur St	London			GB	United Kingdom of Great Britain
50	Shipping	1500	2011 Interiors Blvd	South San Francisco	California	99236	US	United States of America
60	IT	1400	2014 Jabberwocky Rd	Southlake	Texas	26192	US	United States of America
70	Public Relations	2700	Schwanthalerstr. 7031	Munich	Bavaria	80925	DE	Germany
80	Sales	2500	Magdalen Centre, The Oxford	Oxford	Oxford	OX9 9ZB	GB	United Kingdom of Great Britain
90	Executive	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
100	Finance	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
110	Accounting	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
120	Treasury	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
130	Corporate Tax	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
140	Control And Credit	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
150	Shareholder Services	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
160	Benefits	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
170	Manufacturing	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
180	Construction	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
190	Contracting	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
200	Operations	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
210	IT Support	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America
220	NOC	1700	2004 Charade Rd	Seattle	Washington	98199	US	United States of America

Data Viewer for Materialized Views

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	JOB_ID	JOB_TITLE	START_DATE	END_DATE
101	Neena	Yang	AC_ACCOUNT	Public Accountant	Sep 21, 2007, 12:00:00 AM	Oct 27, 2011
101	Neena	Yang	AC_MGR	Accounting Manager	Oct 28, 2011, 12:00:00 AM	Mar 15, 2015
102	Lex	Garcia	IT_PROG	Programmer	Jan 13, 2011, 12:00:00 AM	Jul 24, 2016
114	Den	Li	ST_CLERK	Stock Clerk	Mar 24, 2016, 12:00:00 AM	Dec 31, 2017
122	Payam	Kaufling	ST_CLERK	Stock Clerk	Jan 1, 2017, 12:00:00 AM	Dec 31, 2017
176	Jonathon	Taylor	SA_MAN	Sales Manager	Jan 1, 2017, 12:00:00 AM	Dec 31, 2017
176	Jonathon	Taylor	SA_REP	Sales Representative	Mar 24, 2016, 12:00:00 AM	Dec 31, 2016
200	Jennifer	Whalen	AC_ACCOUNT	Public Accountant	Jul 1, 2012, 12:00:00 AM	Dec 31, 2016
200	Jennifer	Whalen	AD_ASST	Administration Assistant	Sep 17, 2005, 12:00:00 AM	Jun 17, 2011
201	Michael	Martinez	MK_REP	Marketing Representative	Feb 17, 2014, 12:00:00 AM	Dec 19, 2017

Data Viewer for SQL Query Result

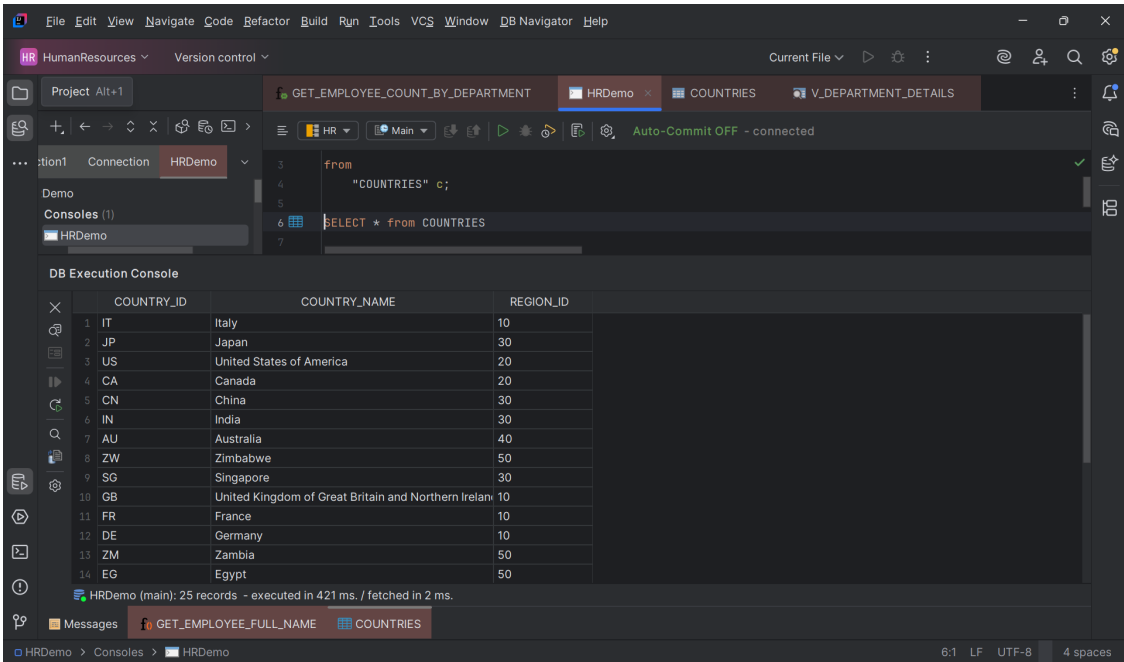
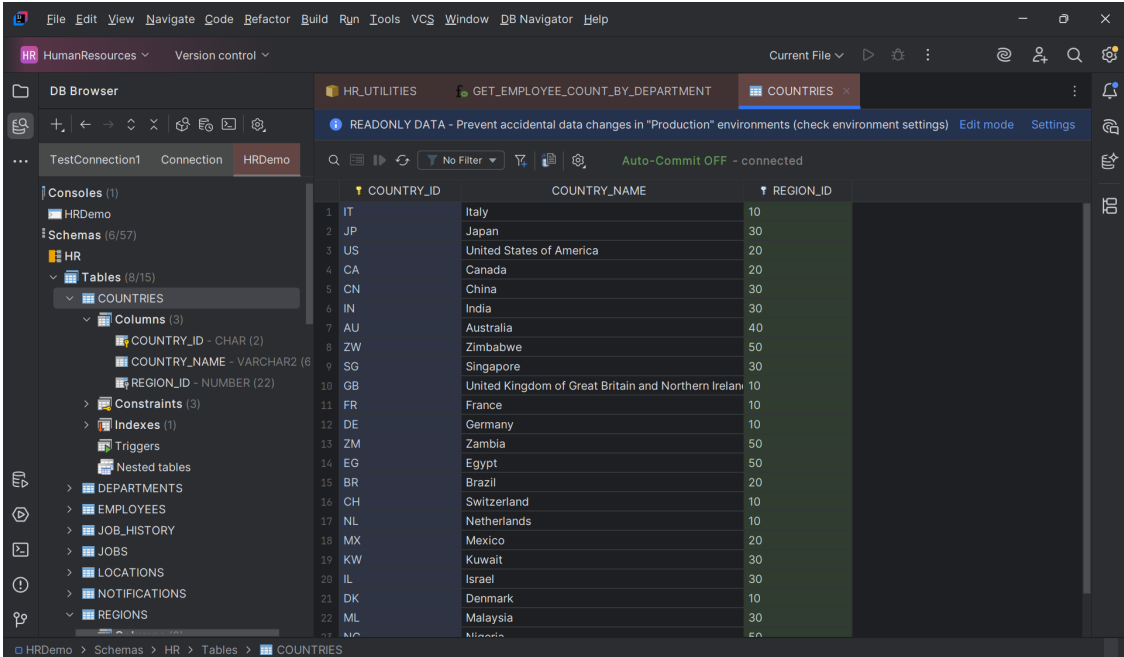


Table Editors

This topic provides an overview of the table editor features.

When you view the data for a database table in the **Table Editor**, based on the settings configured for the DB connection or the environment, inline editing is automatically enabled. Double-clicking the table from the DB Browser window opens the table data in the **Table Editor** window.



Note

For database connections or environments that are set to read-only, you can either change the specific table into **Edit mode** or access the DB environment **Settings** to modify configuration for that environment type.

- Hovering the cursor over the column name displays information about the column including the name, data type, maximum data size of the column, whether the column values are primary key or foreign key.
- Sorting the columns in ascending/descending order or by the column name, or a cell value is possible
- For primary keys column(s) of the table (color-coded), the context menu enables you to view any constraints, indexes associated with the primary key value, and referencing records/datasets.
- For foreign key column(s) of the table (color-coded), the context menu enables you to view any constraints and referenced primary key column(s).
- Export selected records of the database table (or entire table) to specific locations and in different file formats, such as Excel, CSV, XML, HTML, Markdown, etc.

The **Table Editor** window provides a top toolbar ribbon from where you can perform following operations in the table records:

Toolbar Option	Description
Lock Editing	Click to make the data in the table non-editable.
Find Data	Search for specific record by matching the keywords you type in the search box
Edit Record	Select a specific record to view (and edit) it's details in the DB Navigator - Edit Record dialog box
Fetch Next 100 Records	Fetch next 100 records in the table (if available) to display in the editor block
Reload	Reload all the records of the table to fetch updated values in the cells
Select Filter	Filter the table records by the column headers or a cell value. Options include No filter, Basic Filter, or any Custom Filter
Create Filter	Add new filters by creating joins with other tables and adding conditions. Manage filters to modify parameters any existing filter or delete a custom filter created for the table
Duplicate Record	Create a duplicate copy of the selected record
Insert Record	Add a new record to the table
Delete Record	Delete a record from the table
Commit	Manually commit changes for any unsaved transactions
Rollback	Rollback any changes made to the table data
Export Data	Export the data of the table (entire table or a selection) in different file formats and desired location
Options	Access Data Editor settings options

- [Creating Filters in Table Editors](#)
This topic describes the procedure to create and apply filters to view data in table editors.
- [Viewing Database Records](#)
This topic describes the procedure for viewing database records and their details in the data viewer.

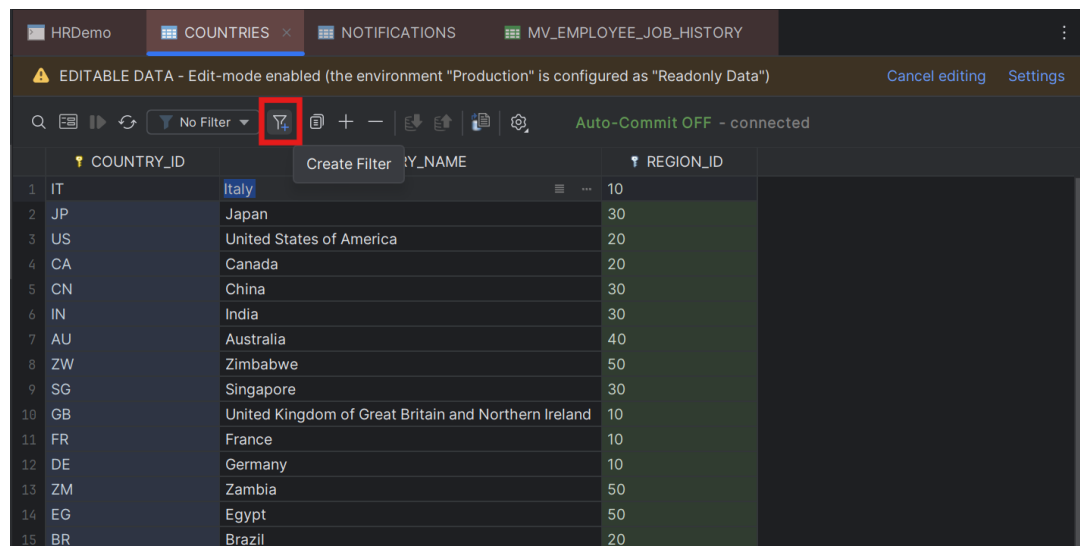
- [Editing Database Records](#)
This topic describes the procedure for editing database records to modify their details in the data editor.
- [Exporting Database Records](#)
This topic describes the procedure for exporting database records to a specific destination in desired file format.

Creating Filters in Table Editors

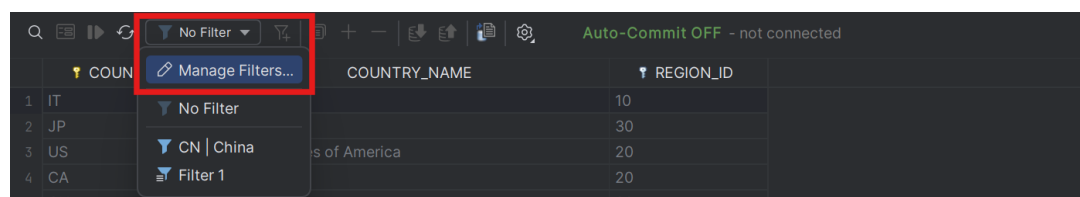
This topic describes the procedure to create and apply filters to view data in table editors.

Table Editors allows you to create and apply filters to narrow down the data you are viewing. You can create two types of filters - **Basic** and **Custom**. Follow these steps to create a new filter:

1. Select the table cell you have opened in the table editor and click the **Create Filter** icon on the editor toolbar menu.



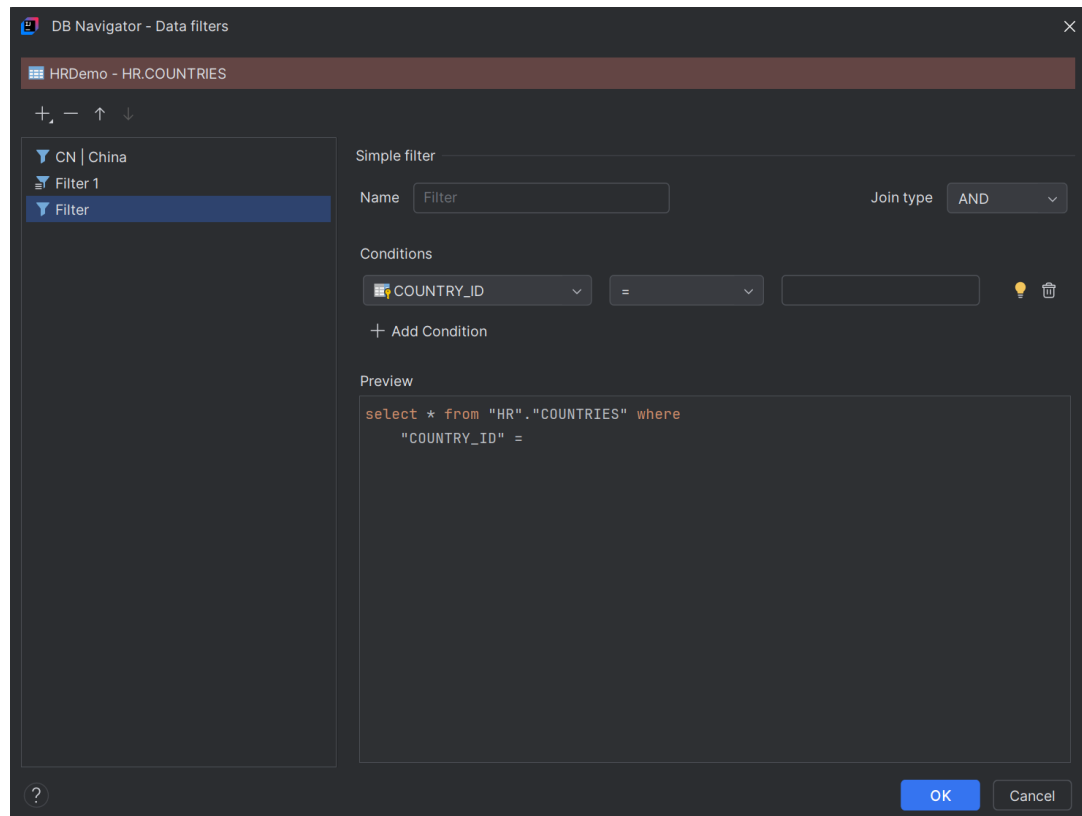
- Alternatively, from the **Filter** drop-down list on the editor toolbar menu (that displays "No Filter", by default), click **Manage Filter** option.



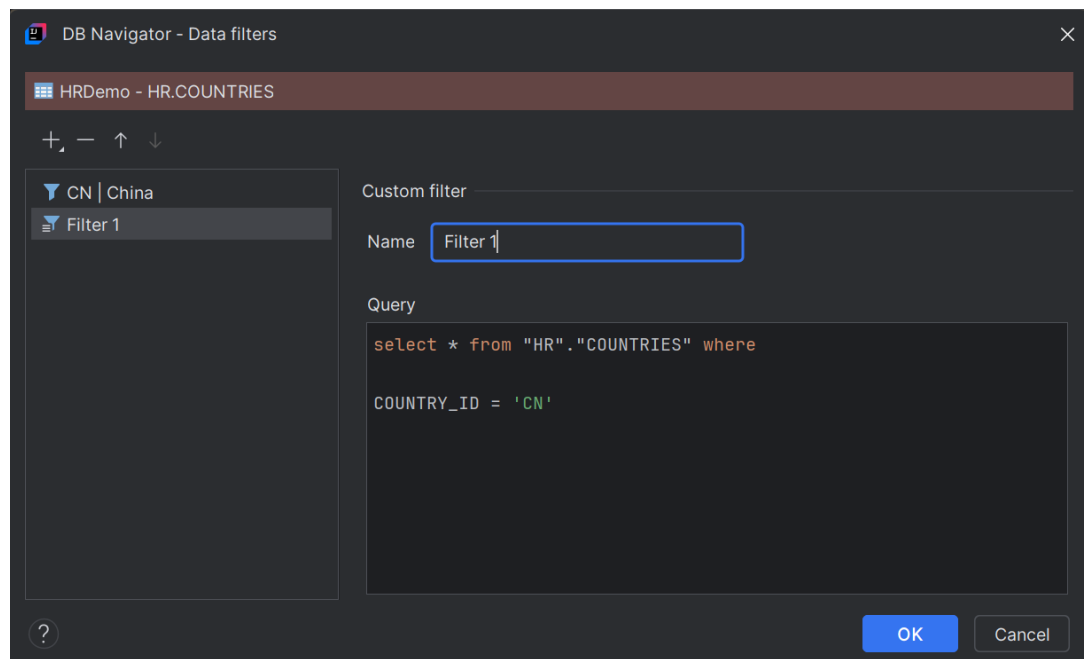
The **DB Navigator - Data Filters** dialog box opens displaying the name of the DB connection and object in which you are creating the filter. Existing filters, if any, are listed in the dialog box.

2. Click the **Create Filter** icon on the dialog box.
3. Select from one of the filter types you want to create. Options are:

- Basic Filter
 - Custom Filter
4. For **Basic Filter**, enter the **Name** of the new filter.



5. From the **Conditions** section, select the column name, operator and value to apply in the filter. You can create multiple conditions.
6. From the **Join Type** drop-down list select AND or OR type to apply to the conditions for the filter. Based on the **Join Type** and the conditions you create, the **Preview** of the filter is displayed.
7. For **Custom Filter**, enter the **Name** of the new filter.



8. Type your custom SQL statement in the **Query** text box.
9. Click **OK** to create the new filter.

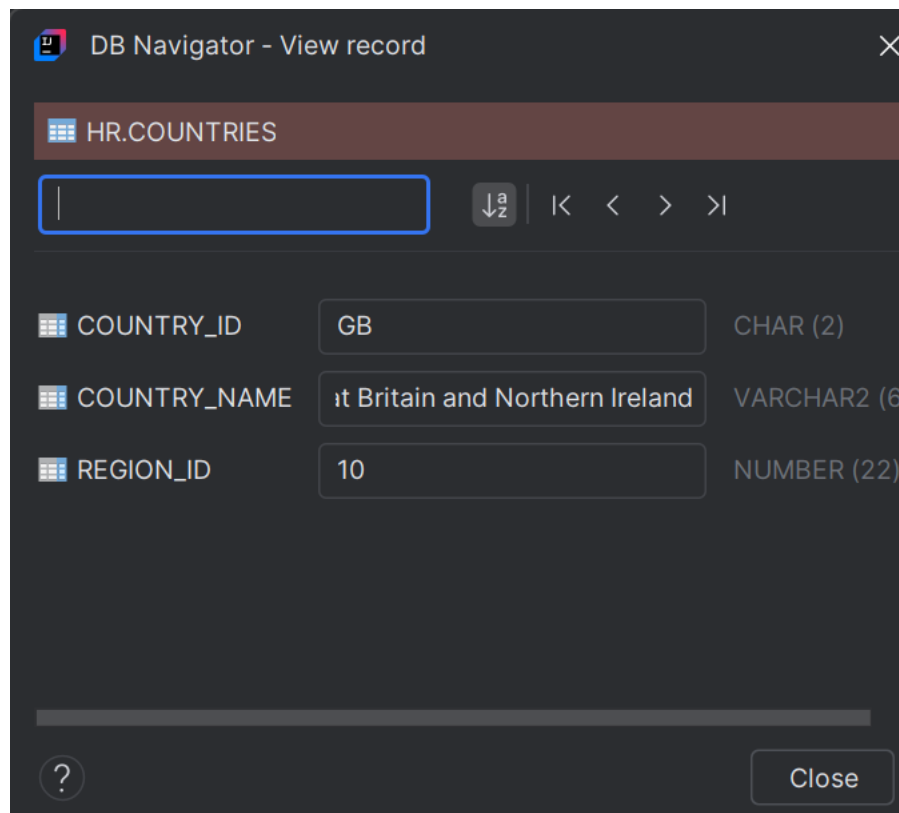
The new filter gets added to the list of existing filters for you to select and apply to the database table.

Viewing Database Records

This topic describes the procedure for viewing database records and their details in the data viewer.

1. Double-click the table cell in the Data Viewer window.

The **DB Navigator - View Record** dialog box opens displaying the qualified name of the database object (table/view/materialized view) you selected.



2. The following information is displayed in the dialog box:
 - Column Names
 - Record value for those columns
 - Character Types of the columns
 - Maximum character length of each column within parenthesis
3. Use the search box to search for a specific record in the table.
4. Navigate to the previous or next record, or to the first or last record of the table using the respective icons. You can also sort the table columns alphabetically.

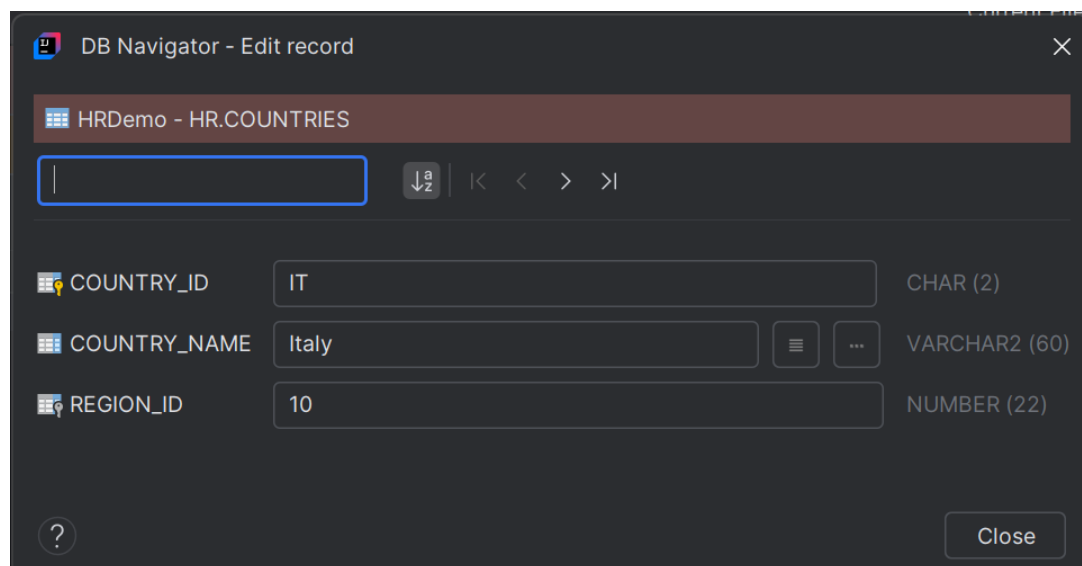
Editing Database Records

This topic describes the procedure for editing database records to modify their details in the data editor.

Follow these steps to modify a database record:

1. Double-click the table cell in the Data Viewer window.

The **DB Navigator - View Record** dialog box opens displaying the qualified name of the database object (table/view/materialized view) you selected.



2. The following information is displayed in the dialog box:
 - Column Names
 - Record value for those columns
 - Character Types of the columns
 - Maximum character length of each column within parenthesis
3. Edit the record values in the text box. For columns that have text box editing enabled, you can also open the text box editor and edit the record content there.
4. Use the search box to search for a specific record in the table and edit its values.
5. Navigate to the previous or next record, or to the first or last record of the table using the respective icons. You can also sort the table columns alphabetically.

Note

If Auto-Commit is enabled for the database connection in which you are making the edits, your changes get saved to the database immediately.

Exporting Database Records

This topic describes the procedure for exporting database records to a specific destination in desired file format.

1. Select the cell record and click the **Export Data** icon from the Data Viewer toolbar menu.
 - Alternatively, right-click the record and select **Export Data** from the context menu.

The qualified name of the database object displays in the **DB Navigator - Export Data** dialog box to indicate the table/view/materialized view from which you want to export data.

DB Navigator - Export data

HR.MV_EMPLOYEE_JOB_HISTORY

Scope

☐ Global

☒ Selection

Format

☐ SQL script ("insert" statements)

☐ HTML

☐ XML

☐ JIRA markup

☒ Microsoft Excel

☐ Microsoft Excel 2007 (xlsx)

☐ Comma separated values

☐ Custom

Options

☒ Create header

☐ Use friendly header names

☒ Quote values containing separator

☐ Quote all values

Quotes

Value separator

Destination

☐ Clipboard

☒ File

Location

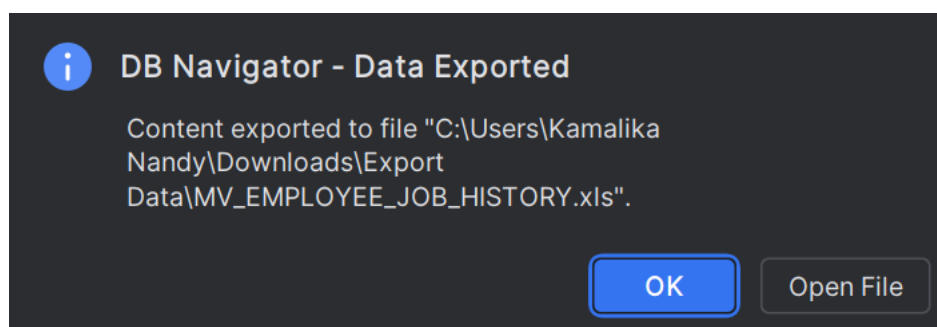
Name

Encoding

Export Cancel

2. Select the Scope of data to export:
 - **Global** - Export the entire table (or any other object type you are viewing/editing)
 - **Selected** - Export only the record from the table you have selected
3. Select the format in which you want to export the data. File formats include:
 - SQL Script
 - HTML
 - XML
 - JIRA Markup
 - Microsoft Excel (.xlsx)
 - Microsoft excel 2007 (.xls)

- Comma Separated Value
 - Custom
4. Based on the selected file format, select from the **Options** that are enabled.
 5. Optionally, create a header for the file to be exported, with friendly header names.
 6. If the selected file format is CSV, you can choose to quote the values containing separator and enter the values.
 - Also, enter the type of **Value Separator**.
 7. Select the **Destination** where you want to export the file, by selecting the folder **Location**, file **Name**, and specify the **Encoding** method (if required for that file format). Alternatively, you can export the file to a Clipboard (copied locally).
 8. Click **Export** to successfully export the file containing the data into the specified location.



9. Click **OK** to close the confirmation message or click **Open File** to view the exported file.

Text Editors

This topic provides an overview of the text editors available in the Database Navigator plug-in.

Oracle® Database Navigator supports editing records of DB tables in plain text editors as well as in editors for other content types such as XML, HTML, XHTML, SQL, Java, JSON and YAML among others. Two types of text editors are available for editing data:

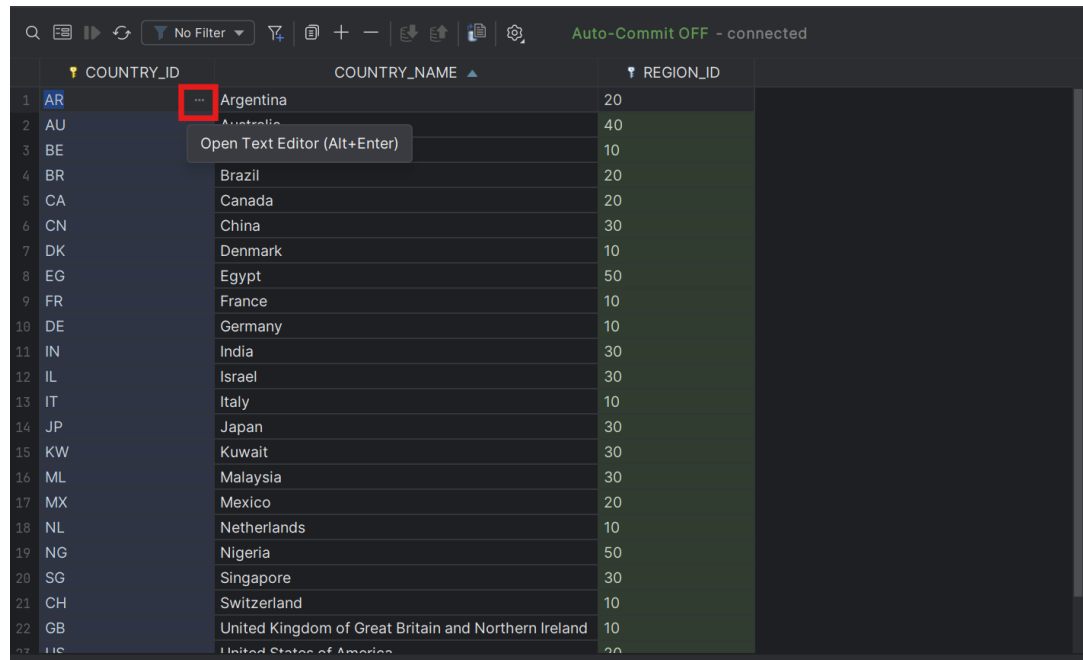
- Basic Text Editor
- Qualified Text Editor
- [Editing Data in Basic Text Editor](#)
This topic describes the procedure to access basic text editor to edit table data.
- [Editing Data in Qualified Text Editor](#)
This topic describes the procedure to access qualified text editor to edit table data in special file formats.

Editing Data in Basic Text Editor

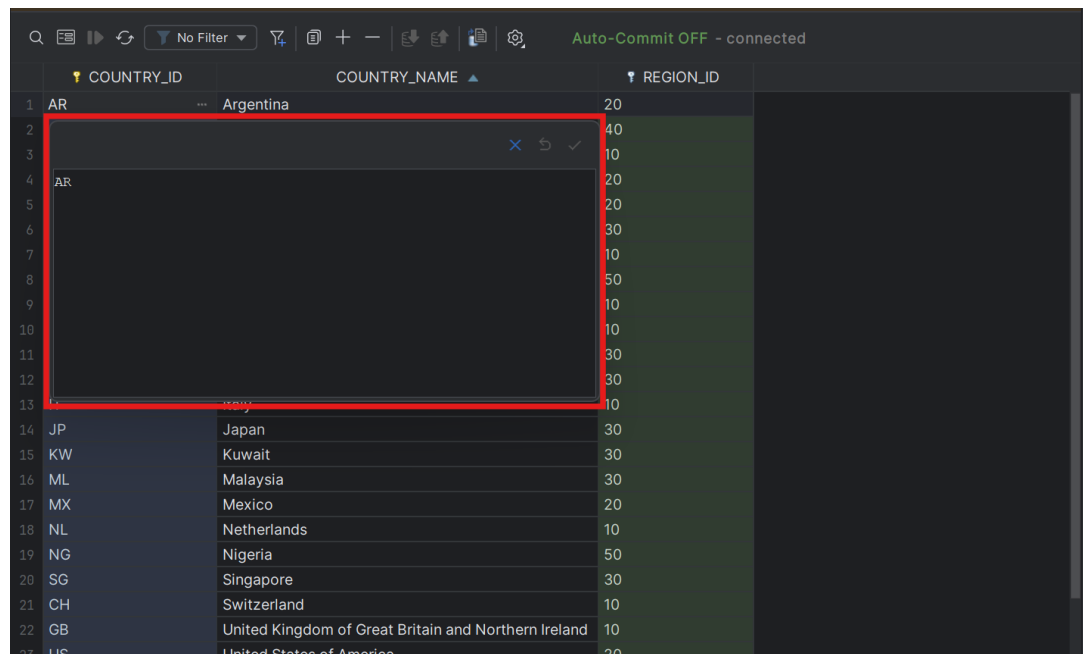
This topic describes the procedure to access basic text editor to edit table data.

You can enable a basic text editor to open while editing database records from the **Data Editor** settings.

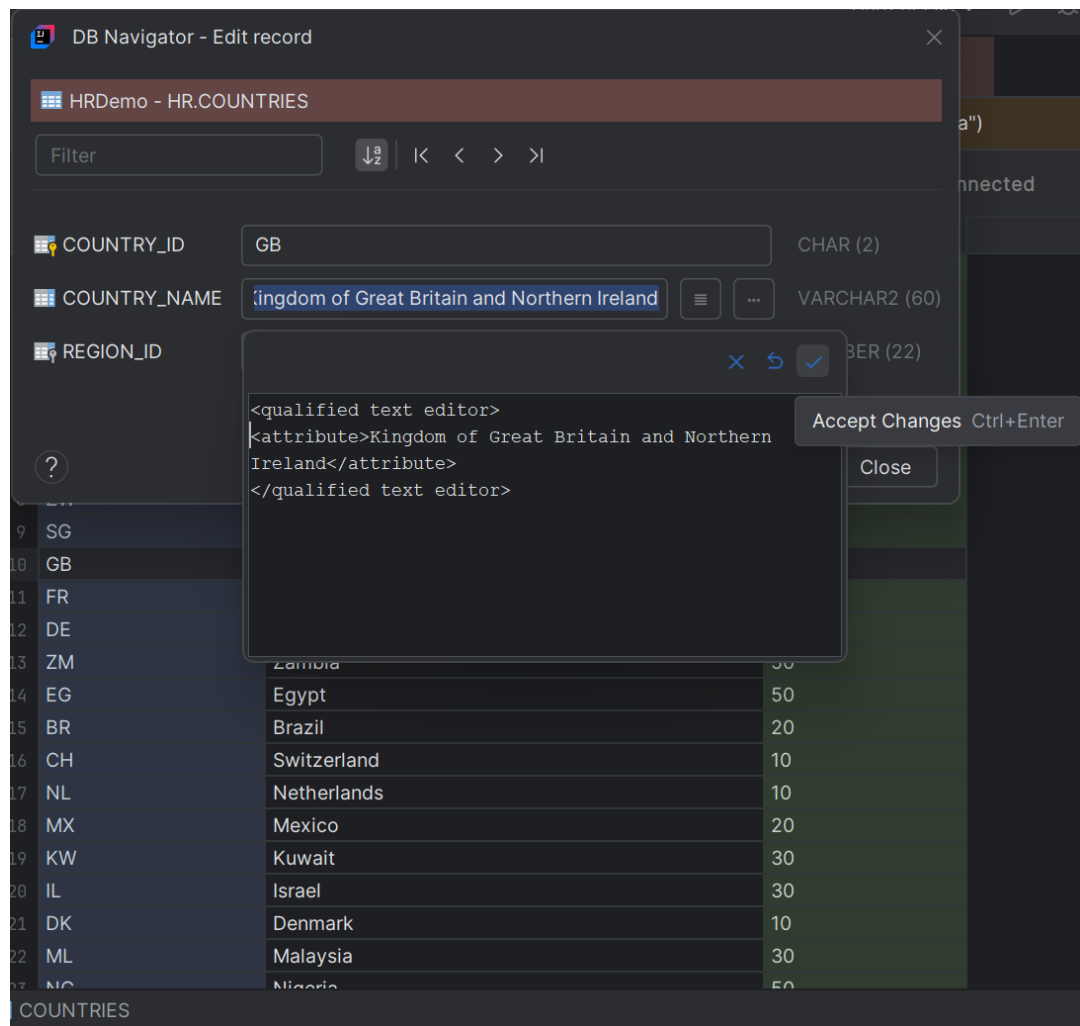
1. Select the table record you want to edit and click the **Open Text Editor** icon that appears on the cell.



The record opens in the Basic text editor window.



2. Edit the cell data in the **Basic Text Editor** window that opens.



3. Click the **Accept Changes** icon to save the changes in the table. If Auto-Commit is enabled for your database connection, the changes you make are immediately transferred into the database.
4. Click the **Revert Changes** icon to revert your edits, or the **Delete Content** icon to remove the changes.

Editing Data in Qualified Text Editor

This topic describes the procedure to access qualified text editor to edit table data in special file formats.

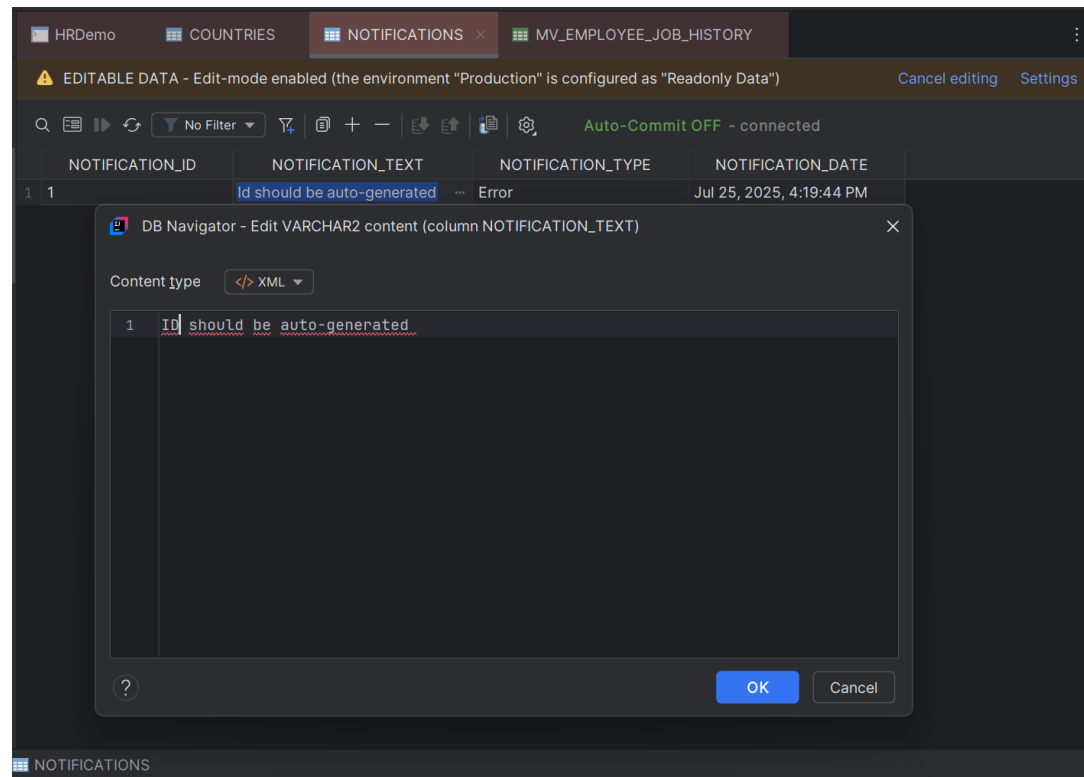
Qualified Text Editor allows you to edit records with specialized data formats such as CLOB / BLOB data types in addition to plain text editing. You can also edit large data objects and binary data stored in the database tables that supports file formats like XML, HTML, XHTML, DTD, SQL, PL/SQL, YAML, JSON and Java among others.

Follow these steps to edit data in qualified text editors:

1. Select the cell that you want to edit on the table editor and click the **Open Text Editor** icon (floating ellipsis) that appears on the cell.

- Alternatively, select the cell to edit and click the **Edit Record** icon on the table editor toolbar menu. In the **Edit Record** dialog box click the **Open Text Editor** icon for the cell.

The record opens in the qualified text editor box.



- From the **Content Type** drop-down list, select the file format in which you want to enter/edit data in the database table. Options displayed in the drop-down are configurable from the **Data Editor** settings.
- Edit the cell content in the editor text box.
- Click **OK** to save your changes to the database.

9

Code Editors

This chapter provides an overview of various code editors available in Oracle® Database Navigator.

The code editor of Oracle® Database Navigator plug-in is the primary interface for writing, editing and optimizing SQL, PL/SQL queries and Java programs. It comes with a bunch of features such as syntax highlighting, code completion assistance, code folding, code navigation, integrated explain plans for SQL statements, integrated CLI terminals, and SQL query result set display among others.

Topics:

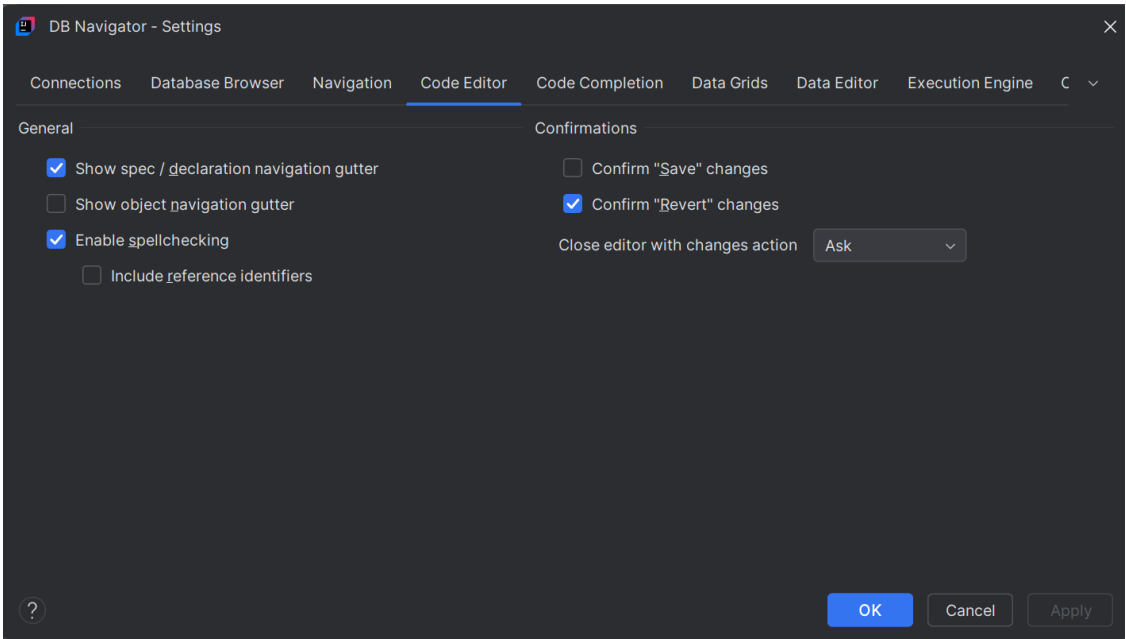
- [Configuration of Code Editors](#)
This topic provides an overview of the type of Code Editors available in Oracle® Database Navigator and their configuration.
- [SQL Editor](#)
This topic provides an overview of the SQL editor in Oracle® Database Navigator plug-in.
- [DDL File Editor](#)
This topic provides an overview of editing DDL script files in the built-in editor.
- [Program Editor](#)
This topic provides an overview of the program editor and its features.
- [Java Editor](#)
This topic provides an overview of the Java Editor features.

Configuration of Code Editors

This topic provides an overview of the type of Code Editors available in Oracle® Database Navigator and their configuration.

Oracle® Database Navigator provides code editors for SQL statements, SQL scripts, methods/functions, Java programs, JSON codes and DDL files. All code editors feature intelligent SQL and PL/SQL support, including syntax highlighting, code completion, and code navigation, along with context-aware intention actions (e.g. "Execute Statement" when the cursor is positioned on a SQL statement).

To configure the code editors, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Code Editor** tab settings.



You can configure the following attributes of code editors from the settings screen:

Settings	Configurations
General	• Enable whether you want gutters (icons on the left side bar of the code editor to provide visual cues indicating breakpoints, breadcrumbs, line numbers, bookmarks, navigation icons, etc.) for – spec and declaration navigation – data object navigation • Enable spell check in your line of code
Confirmations	• Enable saving changes to your code after manually confirming. • Enable reverting changes to your code after manually confirming. • Configure closing the editor with unsaved changes after: – Asking for a confirmation – Saving the changes – Discarding the changes

- [Code Editor Features](#)
This topic provides an overview of common Code editor features.

Code Editor Features

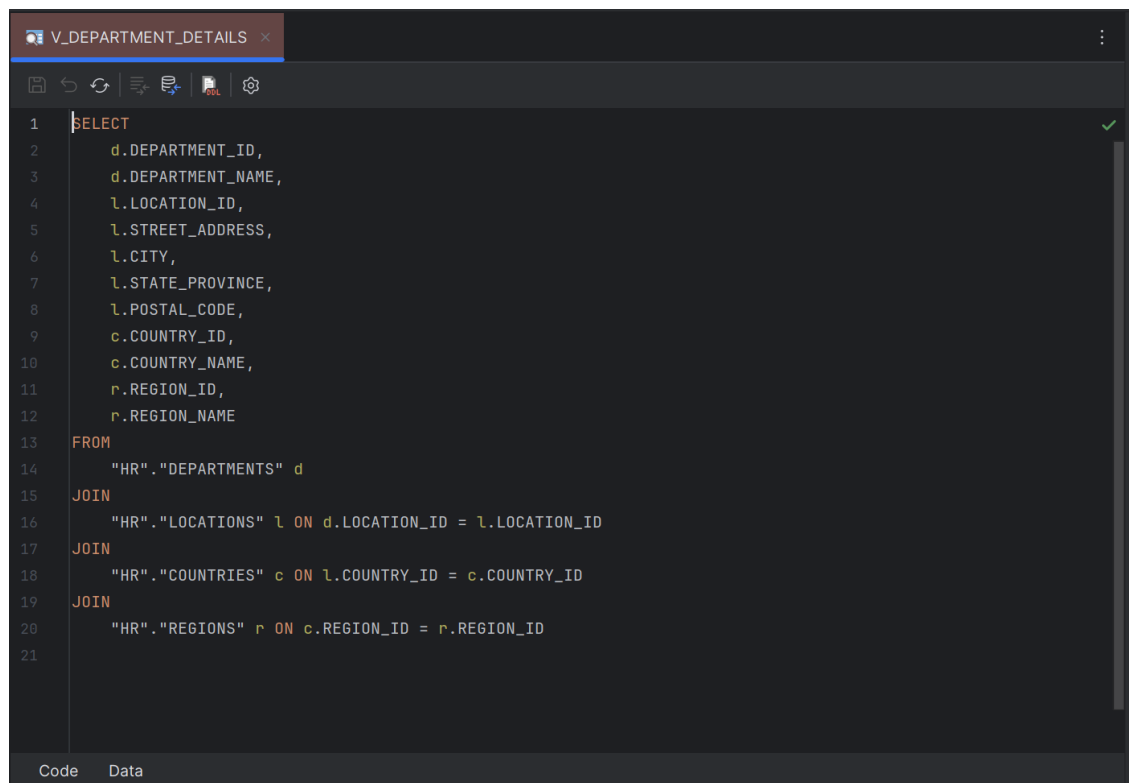
This topic provides an overview of common Code editor features.

When you open a file for editing from the DB Browser pane, it opens in the main editor window as an active tab with the file name. You can open multiple files for editing, each in its own tab. You can hide, close or detach the editor tabs. The maximum number of tabs that you can open simultaneously in the **Code Editor** pane is configurable.

Some commonly available Code Editor features (accessible through the context-menu of the editor pane) are listed below:

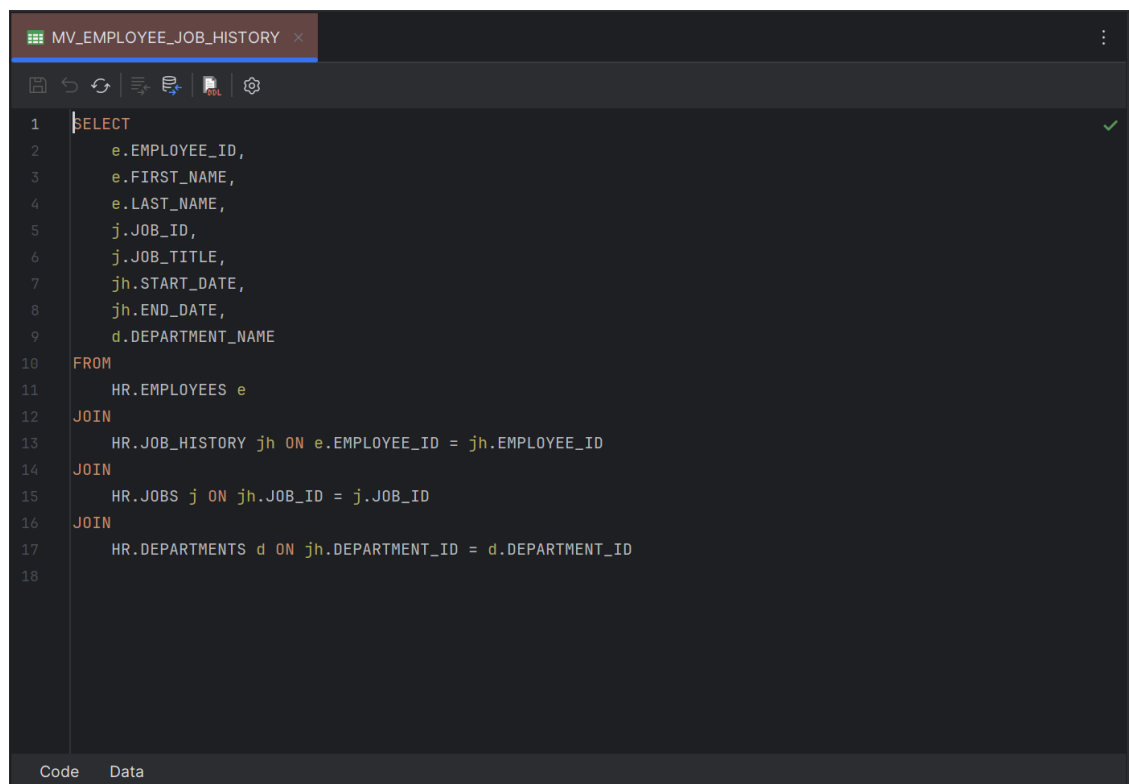
Editor Feature	Description
Split screen	The context menu available by right-clicking the editor tab lets you split the tab in multiple ways. You can also unsplit, move, close, pin and associate the tab with a specific file type.
Highlighting	The SQL syntax highlighting feature marks the association of the SQL script to its database connection by highlighting column names, aliases, table names and schema names. For example, if a selection list item is missing in the FROM clause, the error is highlighted.
Folding	The navigation gutter of the SQL/Program editor displays markers that enable folding/unfolding the SQL statements/code within the SQL script or program code.
Auto Close	Automatically closes, single quote, double quotes or a bracket when you type the first one in the statement.
Error Indication	The editor indicates errors in the SQL statements/code lines by displaying problem markers (colored stripes corresponding to the code line having problems), on the right-hand side scroll bar. Hovering the cursor over the problem markers shows error information such as failed queries or invalid/incomplete SQL statements.
Code Completion	If the Database Navigator plug-in recognizes some identifier as a table/view name, it helps complete the names of tables/columns/views, classes, methods, fields, and keywords within the scope of the database schema by providing them as suggestion in a list form that you can double-click and select.
Code Analysis	The editor provides options to conduct semantic analysis, resolve aliases, inspect the code and conduct code cleanup, analyze nullity scope in the file or project, and view dependencies.
Context-aware Intention Actions	The Show Context Actions icon (represented by a light bulb) to the left of the query text displays a list of intention actions you can take on the SQL script, based on the cursor placement.
Code Navigation	The editor lets you navigate to respective type declarations, code declaration or usages, implementations, super classes (if the selected method is overridden) and even reserved SQL keywords/characters. You can also move between opened files and tabs or jump to the navigation bar.
Code Generation	When editing Java code, the code editor allows you to generate standard code constructs such as method overrides and implementations, constructor for a Java class, delegation methods, getters and setters to name a few.
Code Refactoring	The code refactoring feature helps you improve your source code and provides multiple options to refactor a method, fields or a Java class.

Sample Code Editor for Database Views



```
1 SELECT
2     d.DEPARTMENT_ID,
3     d.DEPARTMENT_NAME,
4     l.LOCATION_ID,
5     l.STREET_ADDRESS,
6     l.CITY,
7     l.STATE_PROVINCE,
8     l.POSTAL_CODE,
9     c.COUNTRY_ID,
10    c.COUNTRY_NAME,
11    r.REGION_ID,
12    r.REGION_NAME
13 FROM
14    "HR"."DEPARTMENTS" d
15 JOIN
16    "HR"."LOCATIONS" l ON d.LOCATION_ID = l.LOCATION_ID
17 JOIN
18    "HR"."COUNTRIES" c ON l.COUNTRY_ID = c.COUNTRY_ID
19 JOIN
20    "HR"."REGIONS" r ON c.REGION_ID = r.REGION_ID
21
```

Sample Code Editor for Database Materialized View



```
1 SELECT
2     e.EMPLOYEE_ID,
3     e.FIRST_NAME,
4     e.LAST_NAME,
5     j.JOB_ID,
6     j.JOB_TITLE,
7     jh.START_DATE,
8     jh.END_DATE,
9     d.DEPARTMENT_NAME
10 FROM
11    HR.EMPLOYEES e
12 JOIN
13    HR.JOB_HISTORY jh ON e.EMPLOYEE_ID = jh.EMPLOYEE_ID
14 JOIN
15    HR.JOBS j ON jh.JOB_ID = j.JOB_ID
16 JOIN
17    HR.DEPARTMENTS d ON jh.DEPARTMENT_ID = d.DEPARTMENT_ID
18
```

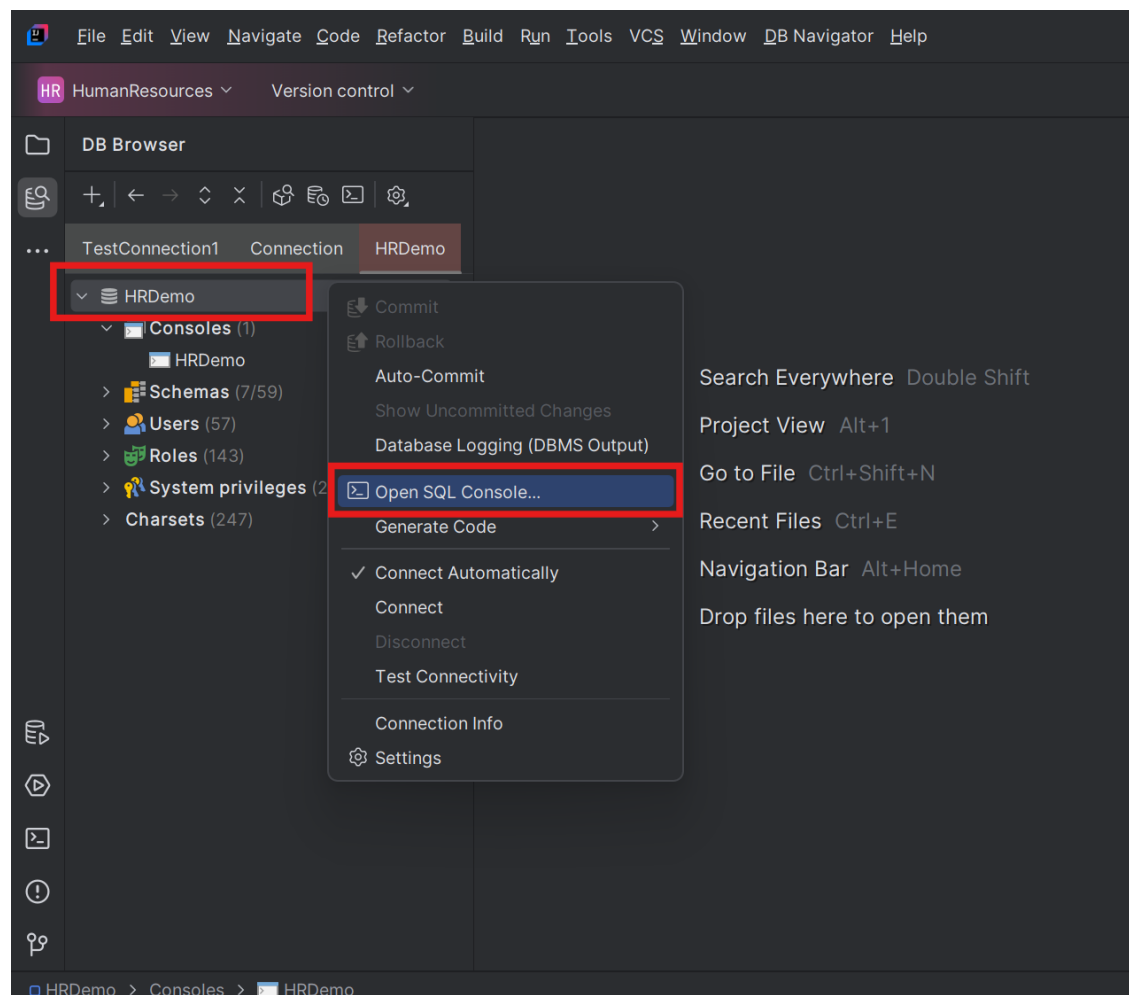
SQL Editor

This topic provides an overview of the SQL editor in Oracle® Database Navigator plug-in.

As part of editing SQL queries, the Oracle® Database Navigator offers SQL consoles that act like terminals stored locally for every database connection and provide direct interaction with the database in terms of executing queries and viewing results. SQL consoles provide a more focused and streamlined SQL development capabilities and enables you in exploring, retrieving, and manipulating data, and testing sample queries.

Oracle® Database Navigator lets you maintain multiple SQL consoles for a database connection. Additionally, it supports a wide range of databases including MySQL, PostgreSQL and SQLite.

To access an SQL console, from the DB Browser pane, right-click the database connection (root folder) and select **Open SQL Console** option from the context menu.



The SQL Console opens in the SQL Editor window on the right-side of the DB Browser pane with SQL statements.

```

4      "COUNTRIES" c;
5
6      SELECT * from COUNTRIES
7
8      SELECT COUNT(*) AS "Number of Employees"
9      FROM "HR"."EMPLOYEES" e
10     JOIN "HR"."DEPARTMENTS" d ON e."DEPARTMENT_ID" = d."DEPARTMENT_ID"
11     JOIN "HR"."LOCATIONS" l ON d."LOCATION_ID" = l."LOCATION_ID"
12     WHERE UPPER(l."CITY") = UPPER('ny') CREATE OR REPLACE FORCE EDITIONABLE VIEW "HR"."V_DEPARTMENT_DETAILS"
13     SELECT
14         d.DEPARTMENT_ID,
15         d.DEPARTMENT_NAME,
16         l.LOCATION_ID,
17         l.STREET_ADDRESS,
18         l.CITY,
19         l.STATE_PROVINCE,
20         l.POSTAL_CODE,
21         c.COUNTRY_ID,
22         c.COUNTRY_NAME,
23         r.REGION_ID,
24         r.REGION_NAME
25     FROM
26         "HR"."DEPARTMENTS" d
27     JOIN
28         "HR"."LOCATIONS" l ON d.LOCATION_ID = l.LOCATION_ID

```

The SQL Console toolbar allows you to perform the following operations on SQL statements:

Toolbar Options	Description
Database Logging (DBMS Output)	Switch database logging on or off to enable/disable the database logging integration during statement execution. This option is only supported for Oracle databases - DBMS output.
Select Current Schema	Select database schema to associate the SQL editor. SQL statement will be executed against the schema you select.
Select Database Session	Select database session for the SQL editor. SQL statements will be executed against the session you select. - To disassociate the SQL editor from a database connection, select the Disable Session Support option. - You can also create a new session and associate the SQL editor to the new database session.
Commit	Commit unsaved changes in the SQL statement to the database.
Rollback	Rollback unsaved changes in the SQL statement to the database.
Execute Statement	Invoke execution of the SQL statement at the cursor.
Debug Statement	Invoke debug execution of the SQL statement at the cursor.
Explain Plan for Statement	Invoke extraction of explain plan for the SQL statement at the cursor.
Execute SQL Script	Invoke execution of the current SQL script using Command-Line Interface of your database.

Toolbar Options	Description
Options	Additional options available are as follows: • Renaming the SQL console • Deleting the SQL console • Save the changes to the SQL statements to file • Create a new SQL console for the database connection • Create a new debug console for the database connection • Access the Code Editor settings

- [Creating New SQL Consoles](#)
This topic describes the procedure to create new SQL consoles within a database connection.
- [Editing SQL Script Files](#)
This topic describes the procedure to write and modify SQL script files in SQL editor.

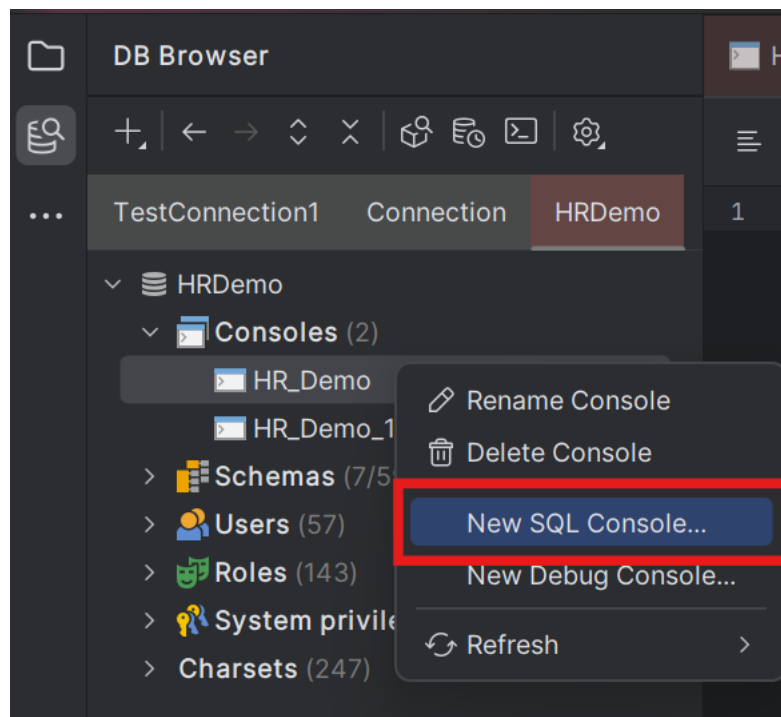
Creating New SQL Consoles

This topic describes the procedure to create new SQL consoles within a database connection.

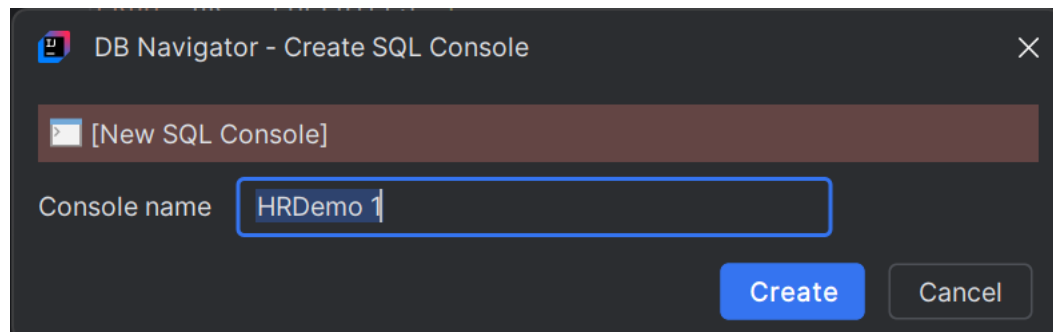
SQL consoles in a database system provides interactive environment to write, execute and manage SQL queries. The SQL console contains a dedicated area for writing and editing SQL statements, which is the SQL Editor window. In addition to writing and editing SQL queries, the console allows you to execute the queries, display results in separate tab, save the query as SQL files, explore the database schema, and manage sessions, among other functionality.

Follow these steps to create a new SQL console in a database connection:

1. Select the DB connection from the DB Browser window and select **New SQL Console** option from the context menu.

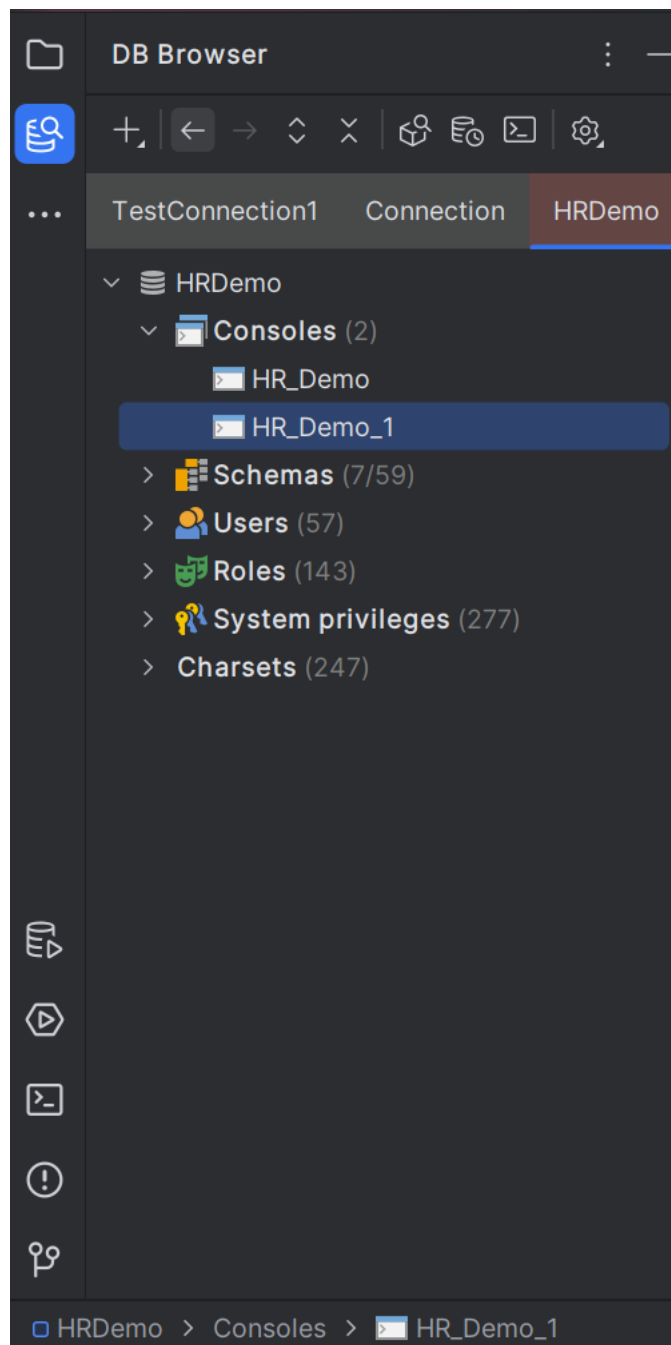


The **DB Navigator - Create SQL Console** dialog box opens.

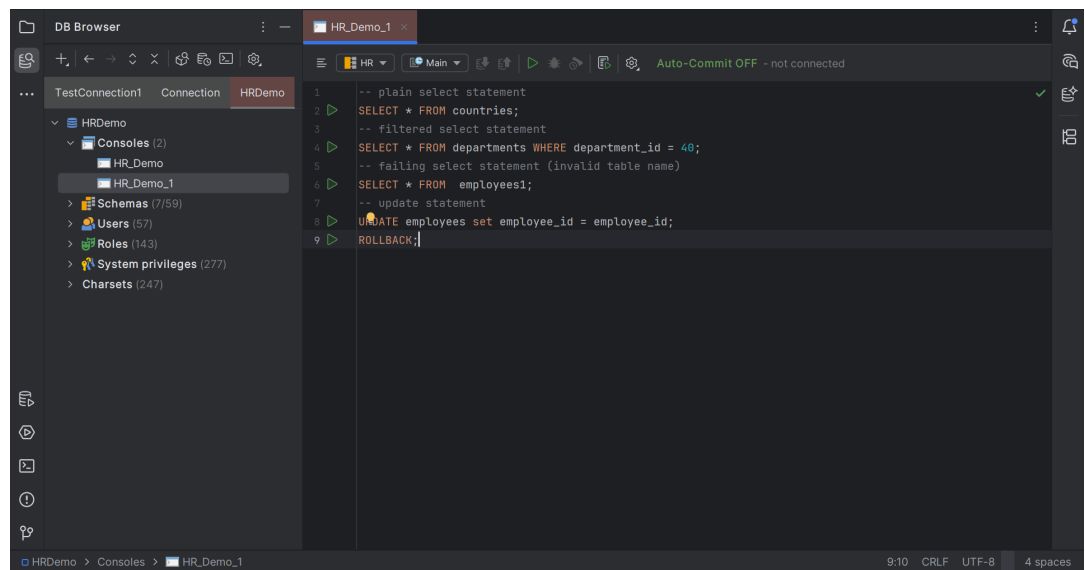


2. Enter the **Console name** in the dialog box and click **Create**.

The new console gets added to the database connection and is visible in the database tree structure on the DB Browser pane.



3. Double-click the new console to open it in the SQL Editor pane.



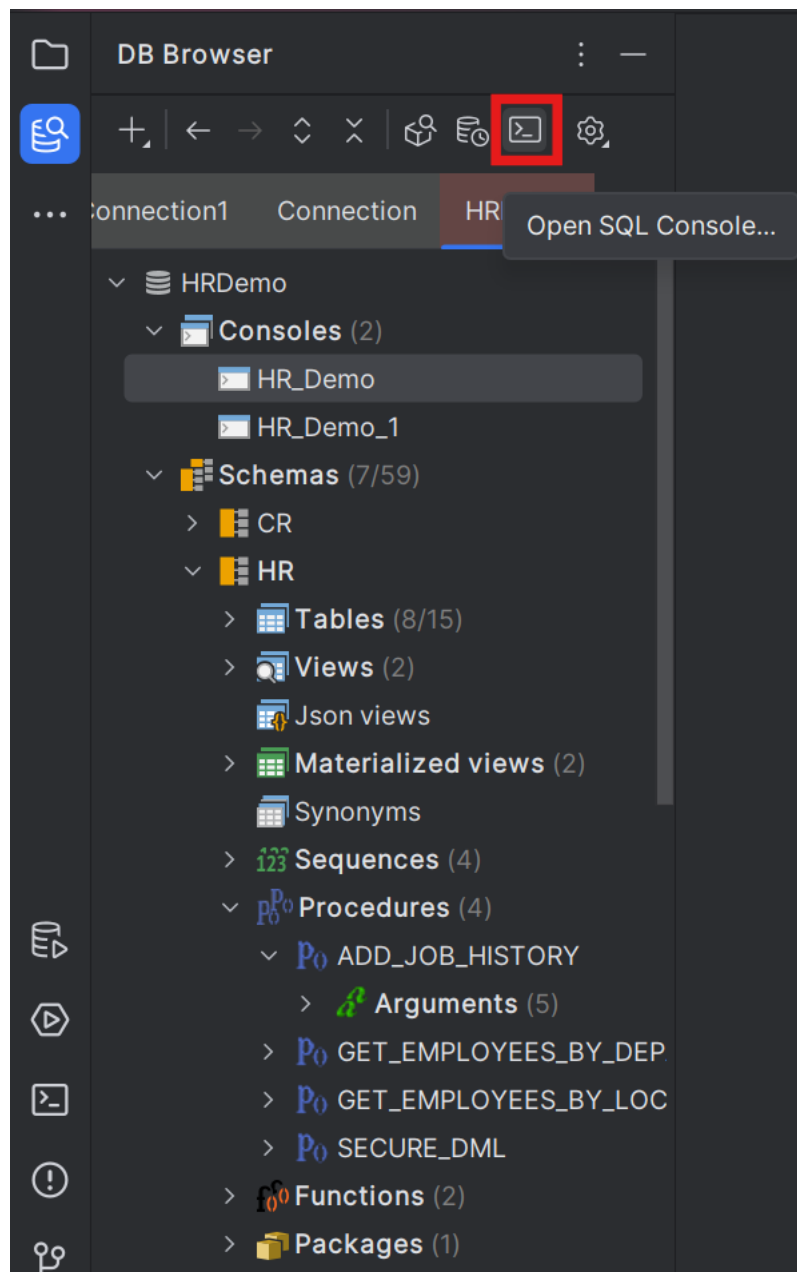
You can write SQL queries in the editor window of the new console and execute the statements.

Editing SQL Script Files

This topic describes the procedure to write and modify SQL script files in SQL editor.

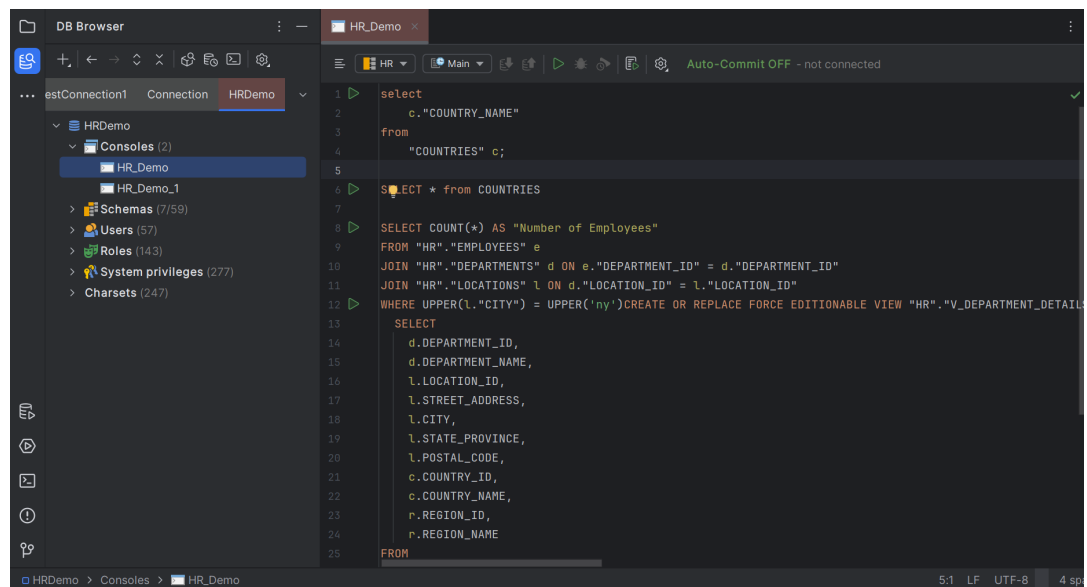
The SQL Editor in Oracle® Database Navigator enables you to write, edit and execute multiple SQL statements, save them as SQL script files and reuse them. To open an SQL script file:

1. From the DB Browser window toolbar, select the database connection and click the **Open SQL Console** icon.



2. Double-click the SQL console from the list of available consoles in the database connection.

The SQL console containing the SQL script opens in the editor window.



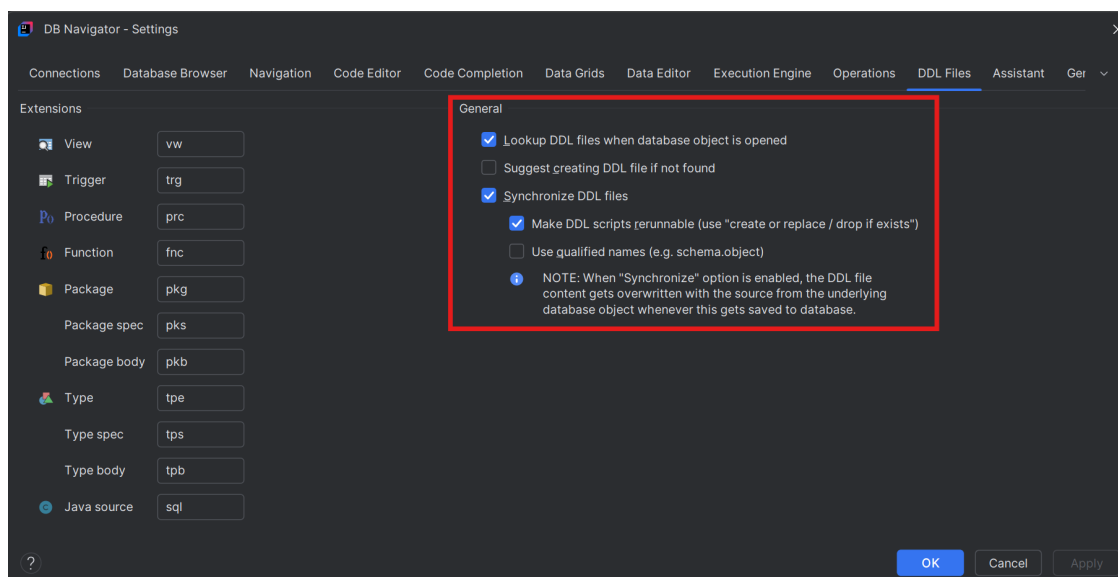
3. Make changes to the SQL script file on the SQL Editor window that offers basic text editing features along with specialized functionality for SQL development.
4. Save and commit your changes to the database.

DDL File Editor

This topic provides an overview of editing DDL script files in the built-in editor.

DDL scripts enable you to define and create data structures and comprise set of SQL commands. DDL files are saved in your local project and associated with database objects. Oracle® Database Navigator allows you to view and synchronize DDL files used in the creation of the database objects or the schema. The DDL File settings lets you configure extensions, extraction methods and synchronization of DDL files.

To access the **DDL File** settings, from the Main menu of Oracle® Database Navigator tool, select **DB Navigator > Settings > DDL Files** tab. For more information, see [DDL File Management](#).



The DDL File Editor provides the following options in the toolbar menu to perform various operations on the DDL script:

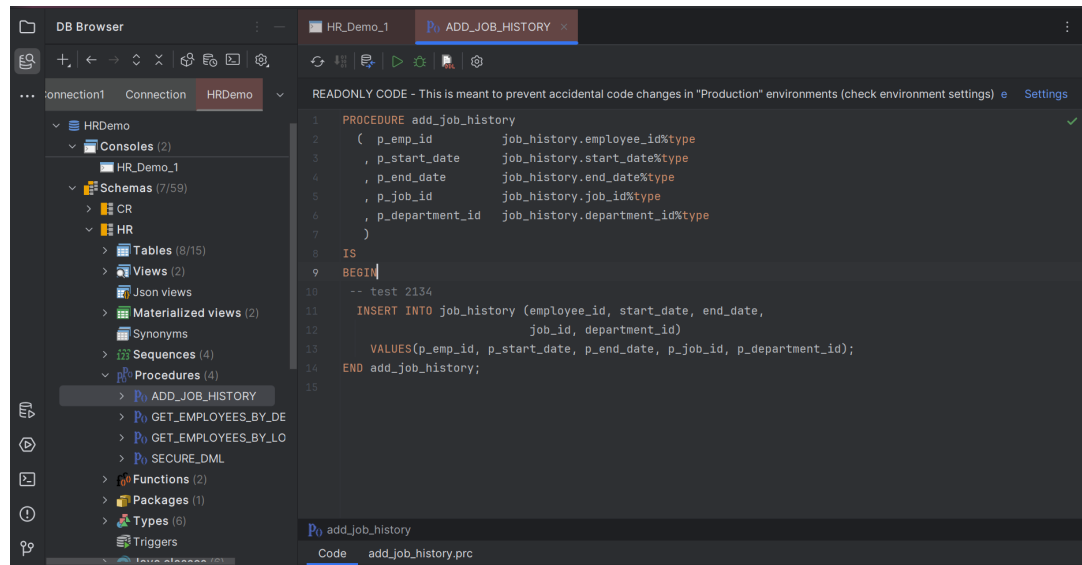
Toolbar Option	Description
Compare with Databases	Switch database logging on or off to enable/disable the database logging integration during statement execution. This option is only supported for Oracle databases - DBMS output.
Execute Method	Invoke execution of the database method at the cursor.
Debug Method	Invoke debug execution of the SQL statement at the cursor.
Explain Plan for Statement	Invoke extraction of explain plan for the SQL statement at the cursor.
DDL File	Invoke attaching an existing DDL to the method or creating a new file, if it does not exist.
Options	Access the Code Editor settings.

- [Creating DDL Files](#)
This topic describes the procedure to create and associate DDL script files to database objects.
- [Disassociating DDL Files](#)
This topic describes the procedure to dissociate DDL script files from database objects.

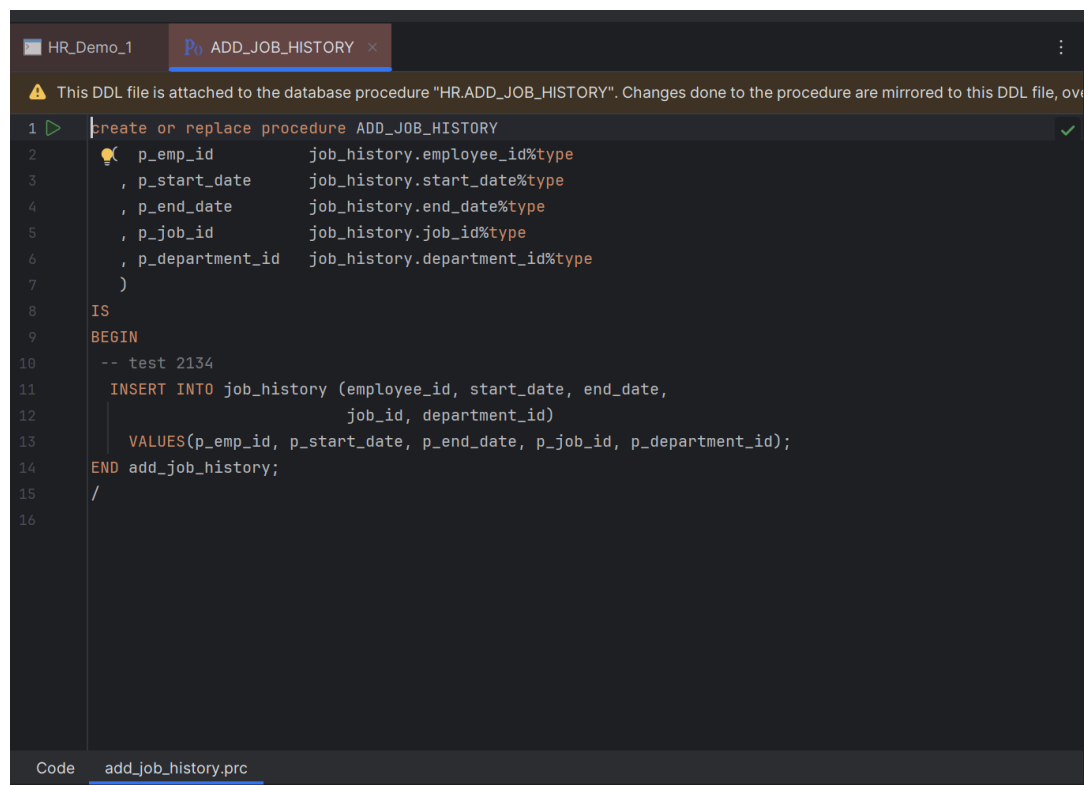
Creating DDL Files

This topic describes the procedure to create and associate DDL script files to database objects.

1. From the DB Browser pane, double-click the object from the database tree structure to open it in the SQL Editor window.



- From the editor toolbar menu, click the **DDL File** icon and select **Create New**. If DDL files are present in the project scope, you can select **Attach Files** option and select the DDL file from the project folder to attach to the database object.
- Select the Project folder location where you want to save the new DDL file. The new DDL file is created and opens in a new tab on the editor window. By default, the created DDL file is attached to the object.

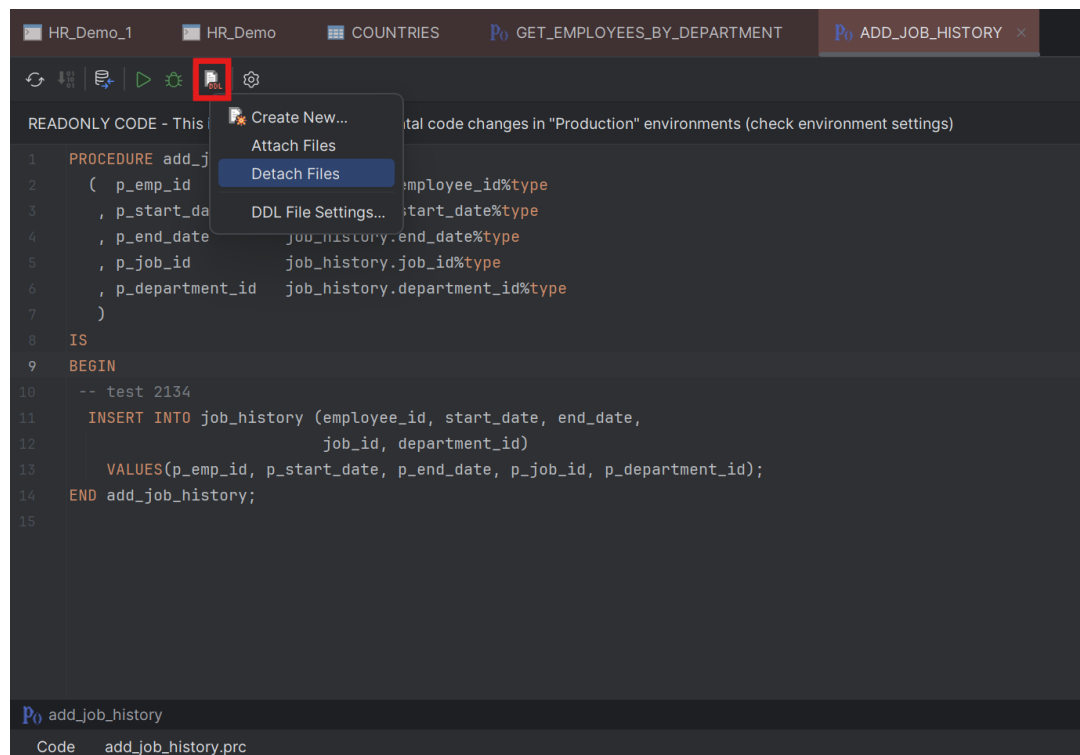


The DDL file extension is based on the database object which it is mirroring. Changes made to the code in the database object are reflected on the attached DDL script. You can commit the attached DDL file to commit your code changes.

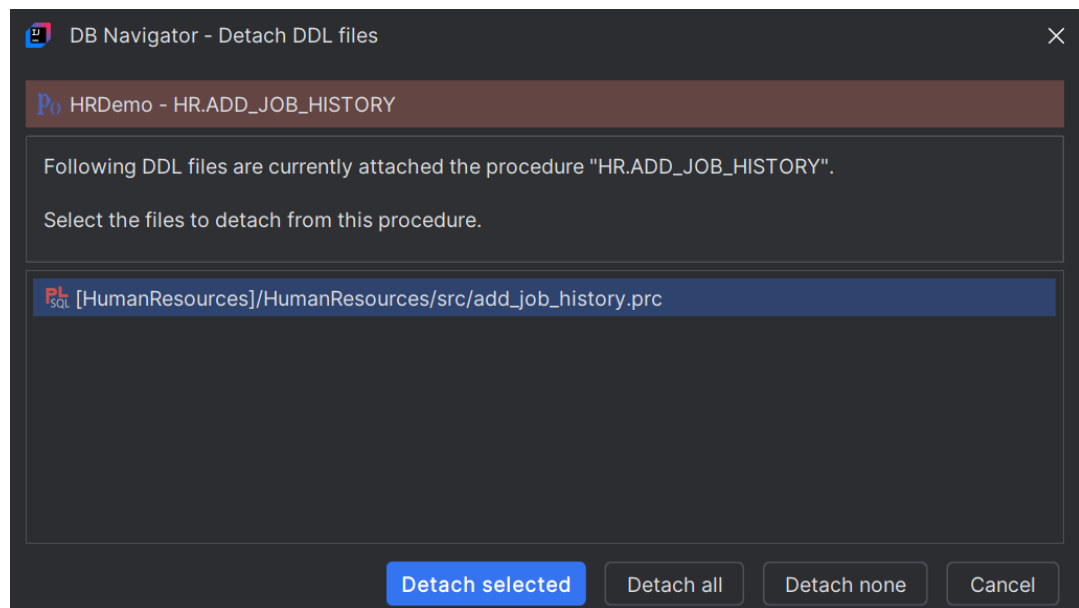
Disassociating DDL Files

This topic describes the procedure to dissociate DDL script files from database objects.

1. Open the data object in the SQL Editor window.
2. From the editor toolbar menu, click the **DDL File** icon and select the **Detach Files** option.

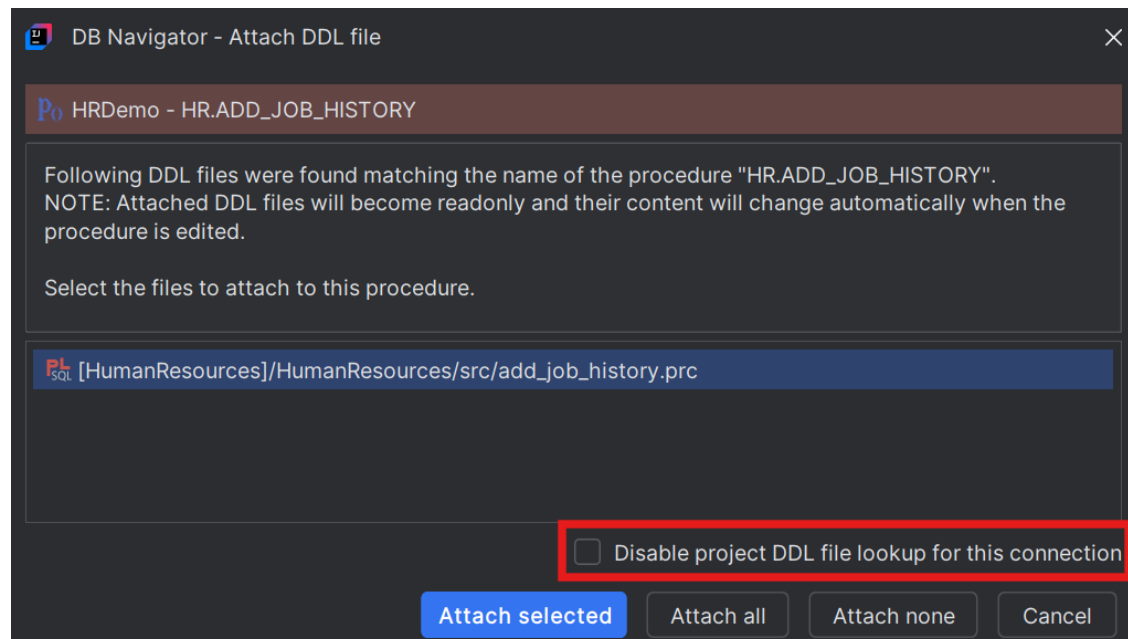


The **DB Navigator - Detach DDL Files** dialog box opens displaying the DDL file(s) associated with the object.



3. Click **Detach Selected** or **Detach All** (if multiple files are attached) to disassociate the object from the DDL file. Detaching the DDL file from the object retains the file in your project scope.

If one or more DDL file is found matching the name of the database object that you open to edit, Oracle® Database Navigator suggests attaching the DDL file to that object. You can also choose to disable the feature of looking up DDL file(s) for a data object in the project scope of the database connection, when you open the DB object in the editor. For that, select the **Disable project DDL file lookup for this connection** check box in the **DB Navigator - Attach DDL File** dialog box.

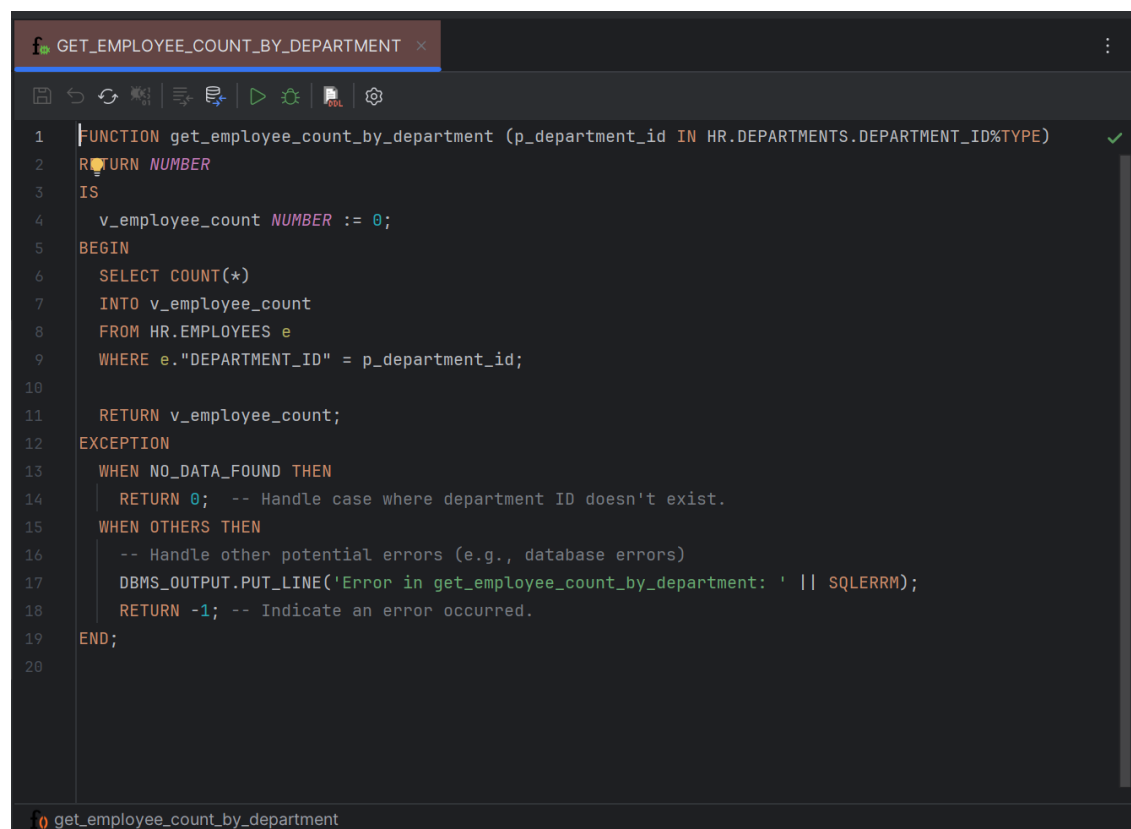


Program Editor

This topic provides an overview of the program editor and its features.

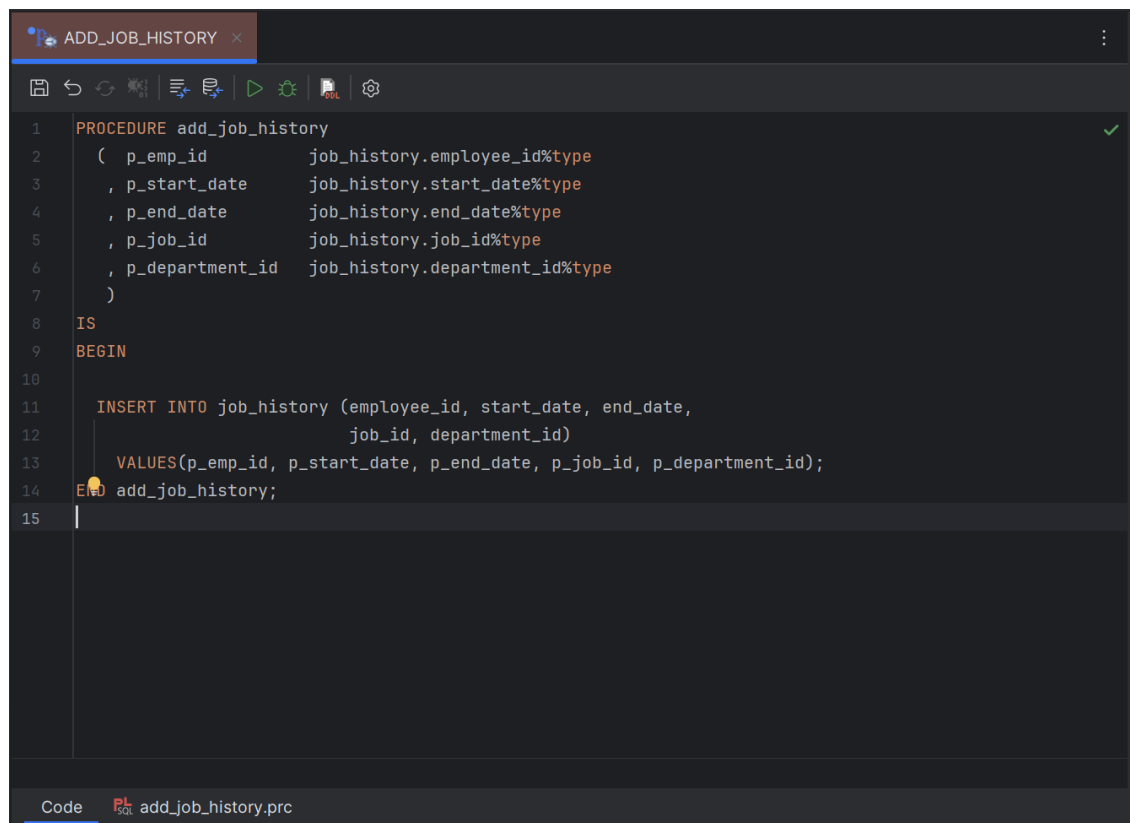
Oracle® Database Navigator Program Editor supports viewing and editing SQL programs including Functions, Procedures, Packages and Types, as well as the code structure for Views and Materialized Views. Apart from making changes to the program, the editor offers special inline editing capabilities that are common across the platform. For more information on the editor settings and program editing features, see [Code Editor Features](#).

Sample Program Editor for Database Functions



```
1 FUNCTION get_employee_count_by_department (p_department_id IN HR.DEPARTMENTS.DEPARTMENT_ID%TYPE)
2 RETURN NUMBER
3 IS
4     v_employee_count NUMBER := 0;
5 BEGIN
6     SELECT COUNT(*)
7     INTO v_employee_count
8     FROM HR.EMPLOYEES e
9     WHERE e."DEPARTMENT_ID" = p_department_id;
10
11     RETURN v_employee_count;
12 EXCEPTION
13     WHEN NO_DATA_FOUND THEN
14         RETURN 0; -- Handle case where department ID doesn't exist.
15     WHEN OTHERS THEN
16         -- Handle other potential errors (e.g., database errors)
17         DBMS_OUTPUT.PUT_LINE('Error in get_employee_count_by_department: ' || SQLERRM);
18         RETURN -1; -- Indicate an error occurred.
19 END;
```

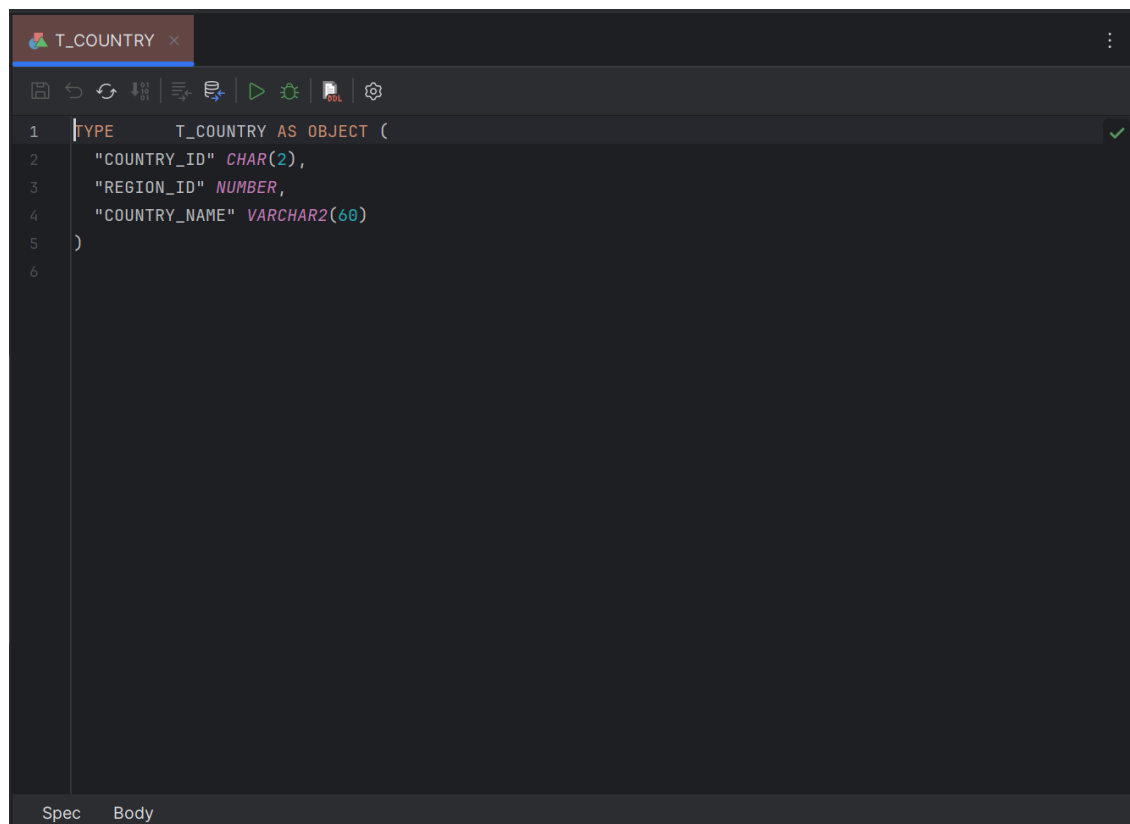
Sample Program Editor for Database Procedures



```
1  PROCEDURE add_job_history
2  ( p_emp_id      job_history.employee_id%type
3    , p_start_date job_history.start_date%type
4    , p_end_date   job_history.end_date%type
5    , p_job_id     job_history.job_id%type
6    , p_department_id job_history.department_id%type
7  )
8  IS
9  BEGIN
10
11     INSERT INTO job_history (employee_id, start_date, end_date,
12                             job_id, department_id)
13     VALUES(p_emp_id, p_start_date, p_end_date, p_job_id, p_department_id);
14  END add_job_history;
15
```

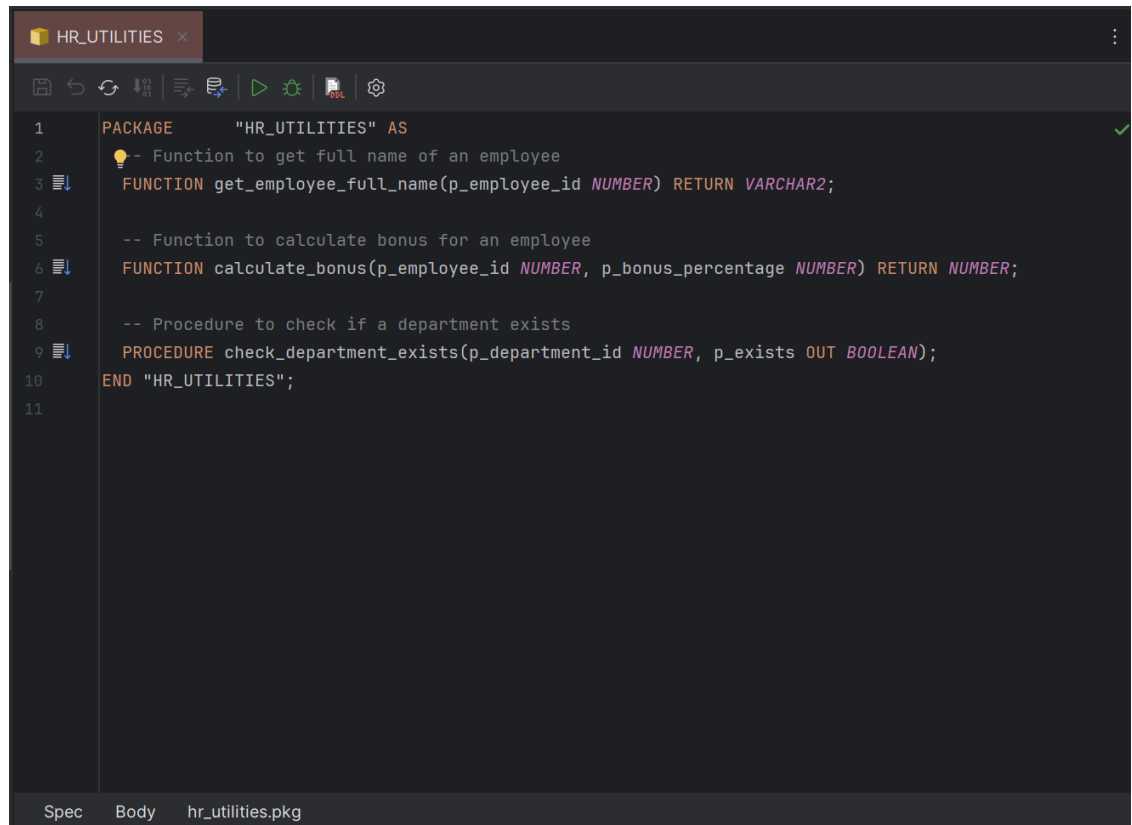
Code  add_job_history.prc

Sample Program Editor for Database Types



```
1  TYPE T_COUNTRY AS OBJECT (
2    "COUNTRY_ID" CHAR(2),
3    "REGION_ID"  NUMBER,
4    "COUNTRY_NAME" VARCHAR2(60)
5  )
6
```

Spec Body

Sample Editor for Database Packages

The screenshot displays the Oracle Program Editor interface. At the top, a tab labeled "HR_UTILITIES" is active. Below the tab is a toolbar with icons for file operations, execution, and settings. The main editor area shows the PL/SQL code for the "HR_UTILITIES" package body. The code includes a package declaration, two functions, and a procedure, all with comments. The code is as follows:

```
1 PACKAGE "HR_UTILITIES" AS
2     -- Function to get full name of an employee
3     FUNCTION get_employee_full_name(p_employee_id NUMBER) RETURN VARCHAR2;
4
5     -- Function to calculate bonus for an employee
6     FUNCTION calculate_bonus(p_employee_id NUMBER, p_bonus_percentage NUMBER) RETURN NUMBER;
7
8     -- Procedure to check if a department exists
9     PROCEDURE check_department_exists(p_department_id NUMBER, p_exists OUT BOOLEAN);
10 END "HR_UTILITIES";
11
```

At the bottom of the editor, there is a tab bar with three tabs: "Spec", "Body", and "hr_utilities.pkg". The "Body" tab is currently selected.


```

1  PACKAGE BODY      "HR_UTILITIES" AS
2      -- Implementation of function to get full name of an employee
3      FUNCTION get_employee_full_name(p_employee_id NUMBER) RETURN VARCHAR2 IS
4          v_full_name VARCHAR2(50);
5      BEGIN
6          SELECT e."FIRST_NAME" || ' ' || e."LAST_NAME"
7              INTO v_full_name
8              FROM "HR"."EMPLOYEES" e
9              WHERE e."EMPLOYEE_ID" = p_employee_id;
10
11         RETURN v_full_name;
12     EXCEPTION
13         WHEN NO_DATA_FOUND THEN
14             RETURN 'Employee not found';
15     END get_employee_full_name;
16
17     -- Implementation of function to calculate bonus for an employee
18     FUNCTION calculate_bonus(p_employee_id NUMBER, p_bonus_percentage NUMBER) RETURN NUMBER IS
19         v_salary NUMBER(8,2);
20         v_bonus NUMBER(8,2);
21     BEGIN
22         SELECT e."SALARY"
23             INTO v_salary

```

The **Program Editor** toolbar allows you to perform the following operations when you make changes to the database methods:

Toolbar Options	Description
Save	Lets you save the changes you make to the program into the database; you alternatively can use Ctrl + S .
Revert Changes	Lets you revert the changes you have made to the program before committing to the database.
Reload	Reloads the latest version of the program code on the editor.
Compile	Lets you compile the SQL program.
Compare with Original	Produces your local version of code alongside the original version of code for comparison and marks out the differences.
Compare with Database	Produces your local version of code alongside the version of code available in database for comparison and marks out the differences.
Run Method	Opens the DB Navigator - Execute Method dialog box where you can enter the input parameters to execute the method.
Debug Method	Asks you to select the type of debugger type before going ahead with program debugging.
DDL Files	Lets you create/attach/detach DDL file for the object you are editing. You can also access the DDL File settings to modify the configurations.
Settings	Access the Code Editor settings for common configurations of the editor panel.

- [Comparing Code Changes with Original/Database Version](#)
This topic describes the procedure to compare code changes with the original version in database.
- [Conflict Resolution of Code Versions](#)
This topic provides explanation on resolving version conflicts for database transactions.

Comparing Code Changes with Original/Database Version

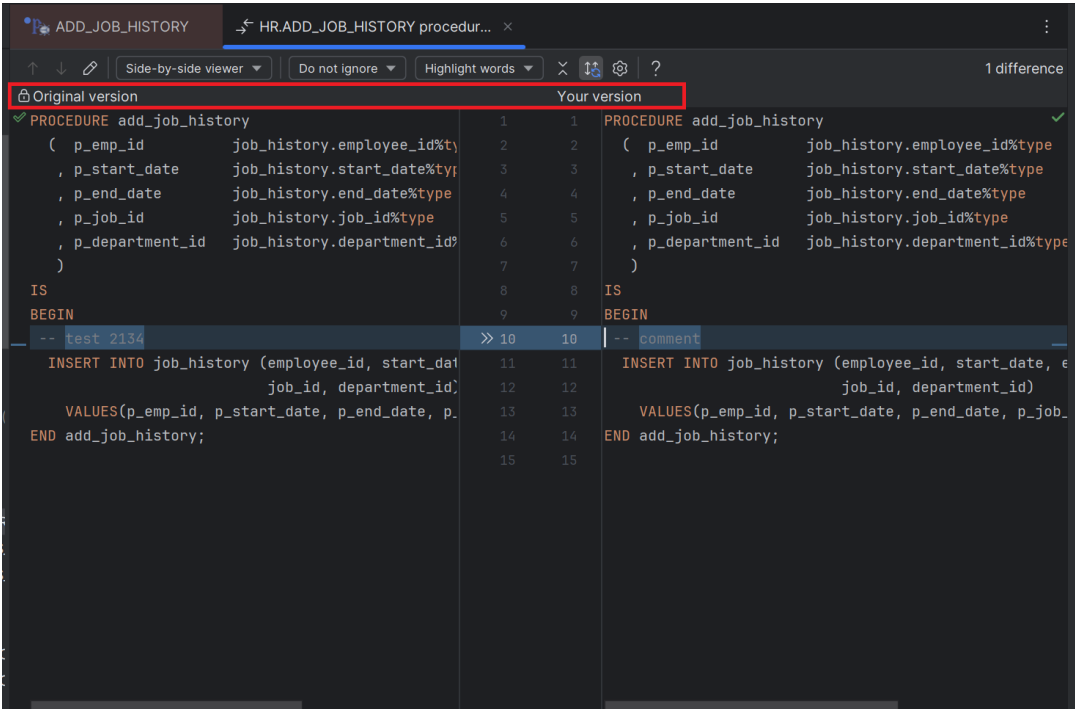
This topic describes the procedure to compare code changes with the original version in database.

1. Open the method in the Program editor window and make the changes.
2. On the Program editor tool, either click **Compare with Original** icon to open your version and the original version of the same program file or click **Compare with Database** icon to open your version and the database version of the same program file.

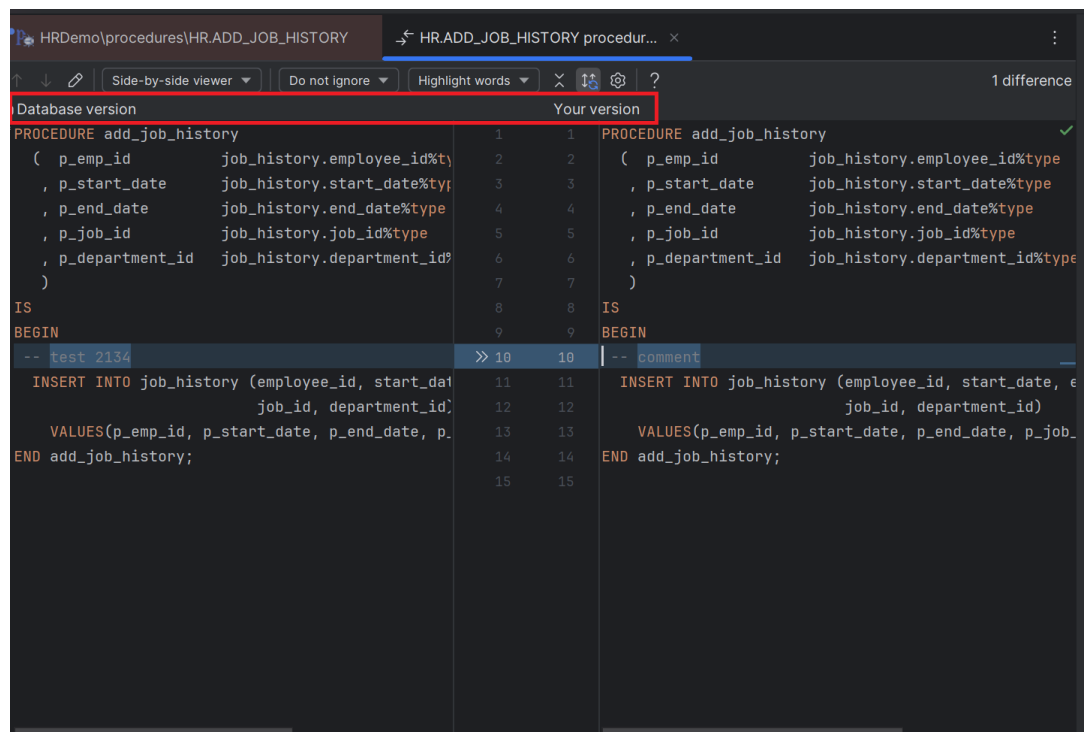
A new tab with the same file name and suffixed with 'Local version' opens along with the active editor tab. The new tab displays both the "Original version" and "Your version" by splitting the editor screen.

- The count of differences found in both versions are listed at the top-right corner of the split window screen.
- The line numbers and the differences in the line of codes are highlighted in both the split screens.

Code comparison between your local version and original database version



Code comparison between your local version and current database version



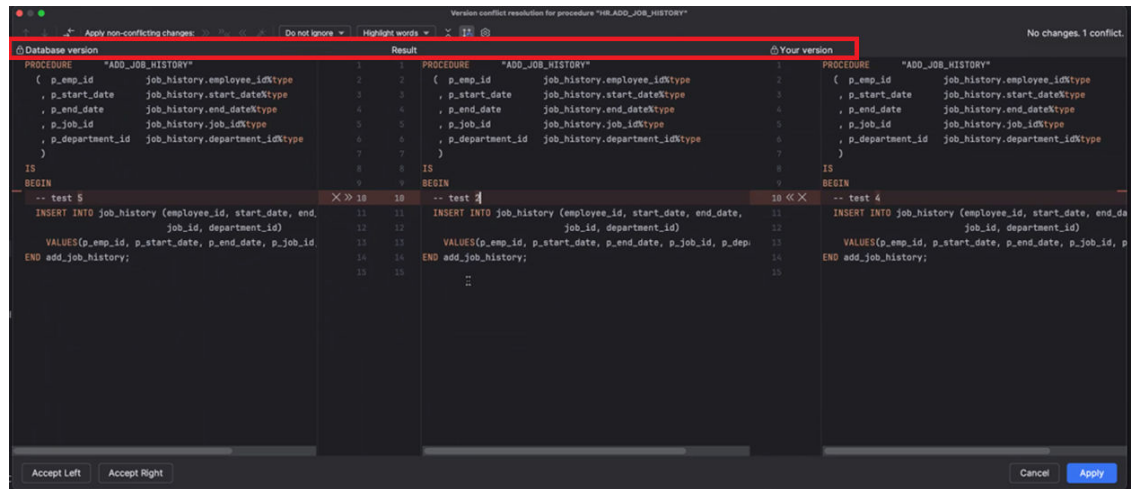
- You can navigate between next and previous differences by using the Up and Down arrow icons on the toolbar.
- You can configure the viewer screen to display the version side-by-side or in a unified screen.
- You can choose to ignore whitespaces and empty lines, or trim whitespaces, or highlight the differences for whitespaces and empty lines.
- You can configure the level of differences (lines, words, characters, etc.) to be highlighted in the viewer screen for both the version.
- You can keep the line of codes/fragments with no differences collapsed on the viewer screens.
- You can also open the original version of the program saved in database in a new editor tab and make changes in that version.

Conflict Resolution of Code Versions

This topic provides explanation on resolving version conflicts for database transactions.

When multiple users try to save changes to their local version of the program, a code conflict occurs. To resolve such code conflicts, and not to override changes made by other users, the Oracle® Database Navigator plug-in displays the code merge screen, with merge confirmation.

The **Version Conflict Resolution for the <Procedure_name>** window opens. This viewer screen is split in three parts displaying the "Database version", "Your version" and the "Result". You will be prompted to either merge your changes with the Result or roll back your changes.

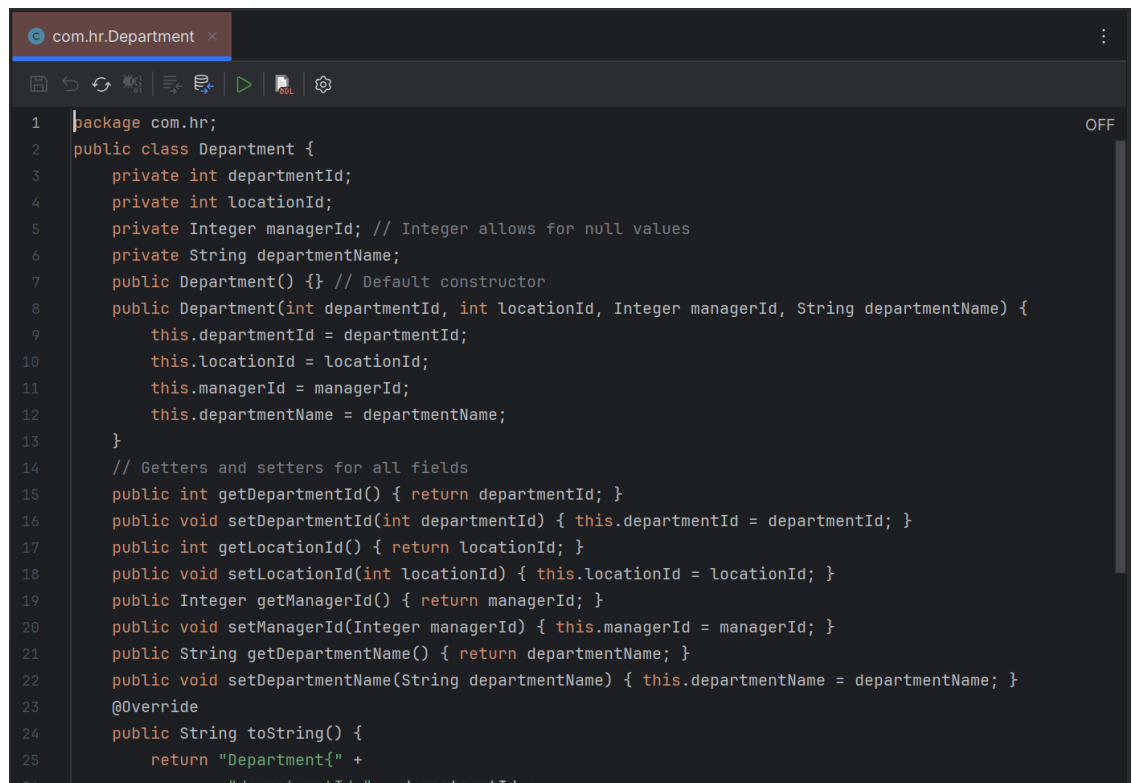


Java Editor

This topic provides an overview of the Java Editor features.

Oracle® Database Navigator plug-in supports editing a source code written in Java programming language. The Java editor offers basic editing features that lets you add, select, move, copy, edit, fold, and save the Java code. For more information on the offered editing capabilities, see [Code Editor Features](#).

For example, to access the Java editor, open a Java class from the DB Browser window. The file opens in the active code editor tab with the name of the Java class.



The Java editor toolbar allows you to perform the following operations when you make changes to a Java program:

Toolbar Options	Description
Save	Lets you save the changes made to the Java code into the database; alternatively you can use Ctrl+S .
Revert Changes	Lets you revert the changes made to the Java code before committing to the database.
Reload	Reloads the latest version of the Java code on the editor.
Compile (Debug)	Lets you compile and debug the code.
Compare with Original	Produces the local version of your code alongside the original version of the code for comparison and marks out the differences.
Compare with Database	Produces the local version of your code alongside the version of code available in the database for comparison and marks out the differences.
Run Method	Opens the DB Navigator - Execute Method dialog box where you can enter the input parameters to execute the code.
DDL Files	Let you create/attach/detach DDL file for the Java class you are editing. You can also access the DDL File settings from this option.
Settings	Lets you access the Code Editor settings for common configurations of the editor panel.

10

Execution Engine

This chapter explains the execution engine and its capabilities of Oracle® Database Navigator.

The built-in execution engine in Oracle® Database Navigator executes line by line of codes including calling methods, execute an entire file, an individual cell containing code or method calls, or commands, calls the debug console to evaluate expressions, and compile projects.

Topics:

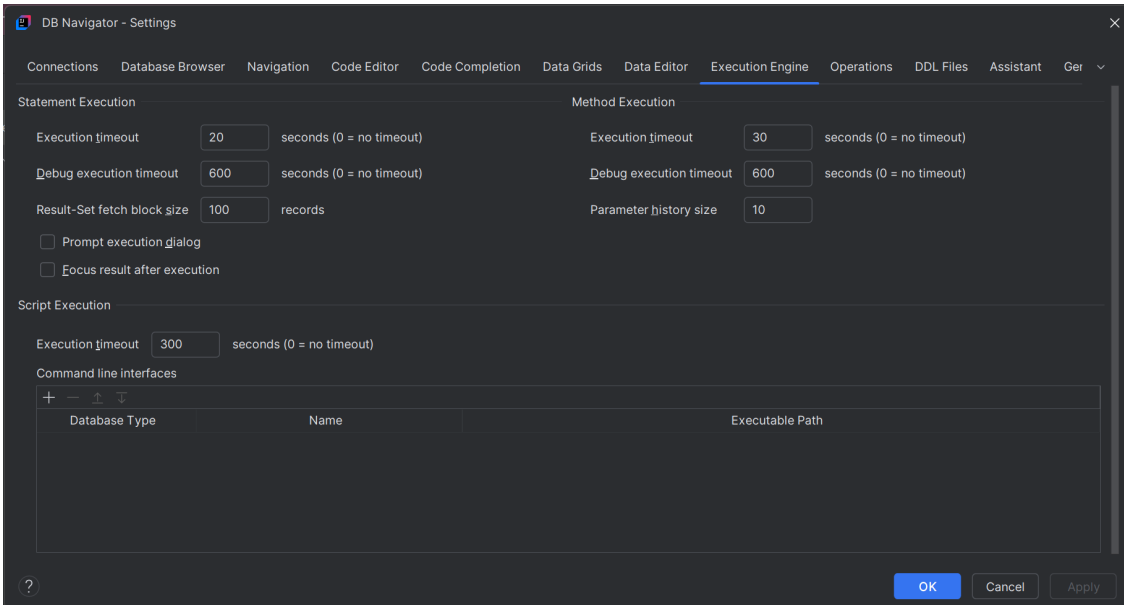
- [Working with Execution Engine](#)
This topic provides an overview of the execution engine and its configurations.
- [Database Execution Console](#)
This topic provides an overview of the database execution console window.
- [Executing Statements](#)
This topic describes the procedure to execute PL/SQL statements.
- [Executing Scripts](#)
This topic describes the procedure to execute PL/SQL scripts.
- [Executing Methods](#)
This topic describes the procedure to execute methods or functions.
- [Executing Java Programs](#)
This topic describes the procedure to execute Java programs.

Working with Execution Engine

This topic provides an overview of the execution engine and its configurations.

Oracle® Database Navigator enables you to run and compile PL/SQL queries, SQL scripts, methods and Java programs with its execution engine that runs in the background and displays the results in the respective results tab of the DB Execution Console window. Based on whether you are executing a statement, a script or a method, you can configure various settings that define the execution parameters such as the execution time, debug timeout duration, default size of result block, storing history of execution parameters, and more.

To configure the execution engine parameters, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Settings > Execution Engine** tab.



Following are the settings that you can configure for executing statements, scripts and methods in the Database Navigator execution console:

Settings	Configurations
Execution Timeout	Set the maximum time duration (in seconds) for the program or script to run before it automatically stops to prevent stalled operations or over-consuming/blocking background resources. You can execution timeout duration for individual SQL statements, SQL scripts and methods.
Result set fetch block size	Set the maximum number of records that will be display in the execution results block at a time when a SQL statement or script is run. If the result exceeds the number of set records, you can fetch the remaining records in sets of the block size configured in this field.
Prompt Execution Dialog	Enable to open an execution dialog box when you run a script with multiple SQL statements. The dialog box provides target context where you can verify and modify (if required) the execution parameters such as database connection, target schema and session, and statement(s) to run.
Focus result after execution	Moves the default focus on the output of the results tab in the DB execution console window instead of having the cursor on the editor window.
Parameter History Size	Set the maximum number of input parameter values that can be saved for execution of an SQL or a Java method. The saved values populate as 'possible values' for the input parameter if you try to run the method for which the parameter history is saved.
Command Line Interfaces	Add a new command line interface client terminal for a database type to directly execute the SQL and PL/SQL scripts, bypassing the plug-in connection. Oracle® Database Navigator currently supports SQL*Plus tool for Oracle databases.

Database Execution Console

This topic provides an overview of the database execution console window.

The **Database Execution Console** (or DB Execution Console) window is the area where the results of the executed statement/script or program is displayed. This console window is automatically displayed after the execution of a program or code is complete. The following are displayed on the console:

- input parameter(s) and corresponding output
- results in the forms of table records for SQL statements and scripts
- compiler messages
- statement execution messages including success or error messages

Following toolbar options are provided in the **DB Execution Console** window allowing you to perform various operations in the displayed results:

Toolbar Options	Description
Close	Close the execution console window.
View SQL Statement	Points to the SQL statement corresponding to the line/record in the result that has been run.
View Record	Open the DB Navigator - View record dialog box to view details of a specific record such as the column name, character type, and max character limit.
Edit Method	Applicable for method execution only. Returns the focus on the Program Editor window by enabling the cursor on the line of program.
Open Execution Dialog	Applicable for method execution only. Opens the DB Navigator - Execute Method dialog box and lets you modify the input parameter(s) and target context such as database schema or connection.
Fetch Next Records	If the number of records found in the result exceeds the configured maximum number of records that can be displayed at a time, click this to fetch the next set of result block.
Rerun Statement	Execute the SQL statement again. Applicable for SQL statement results.
Execute Again	Applicable for method execution only. Enables re-execution of the method.
Stop Execution	Applicable for method execution and is only enabled when you select Execute Again option. Enables pausing the execution before it completes.
Find Data	Search for a specific record in the results data by typing matching text or regex keyword.
Export Data	Opens the DB Navigator - Export Data dialog box to export either a selected record or the entire query result to a specified destination in the desired file format.
Expand All	Expand the result block. Applicable for SQL script results.
Collapse All	Collapse the result block. Applicable for SQL script results.
Settings	Access the Execution Engine Settings.

You can change the position, view mode and size of the **DB Execution Console** window per your preference on the IDE platform to which you have the Oracle® Database Navigator plug-in installed.

Executing Statements

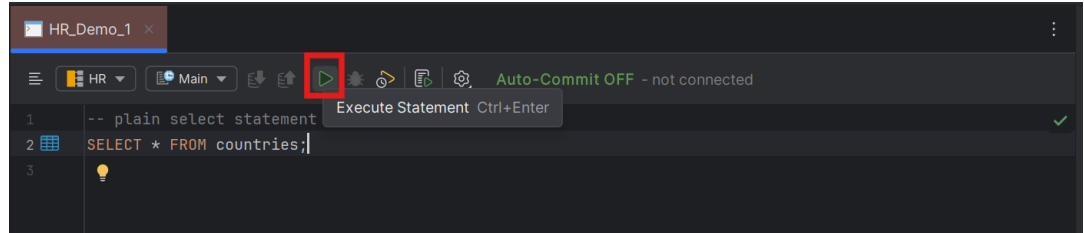
This topic describes the procedure to execute PL/SQL statements.

The execution engine in the Oracle® Database Navigator tool supports running individual SQL statements and display the results in respective tabs of the **DB Execution Console** window. To execute an SQL statement in the editor window:

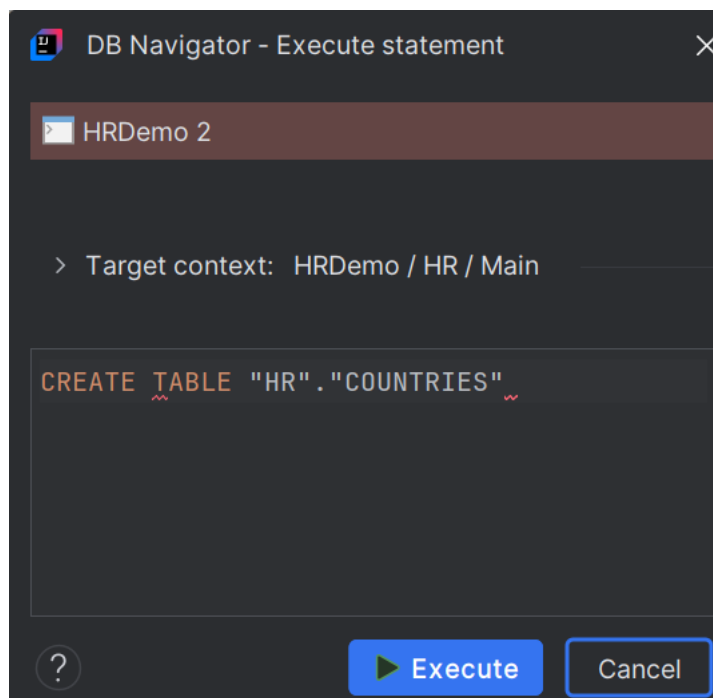
1. Open the database object from the DB Browser pane containing the SQL statement to edit in the SQL editor.
2. Write or edit the SQL query statement.

For example, `SELECT * FROM countries;`

3. Click the **Execute Statement** icon either on the left-hand side navigation gutter (icon appears next to the caret) or from the toolbar menu of the SQL editor window.

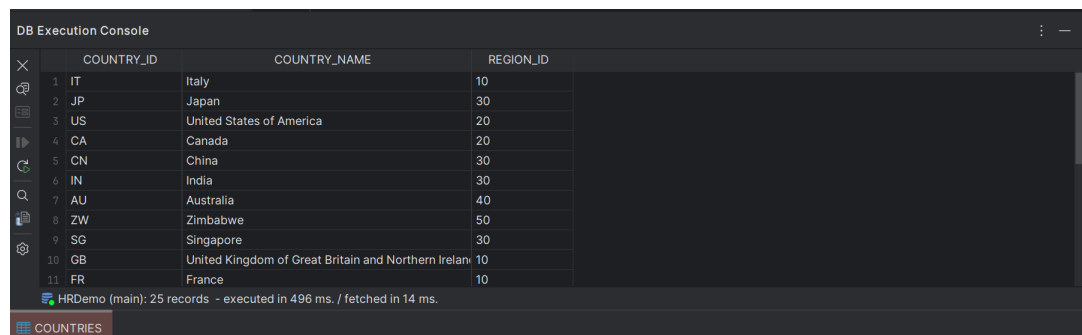


The **DB Navigator - Execute Statement** dialog box displays (if configured) with details of the target database connection, schema, and session where the statement will be executed.



4. Click **Execute**.

The **DB Execution Console** window opens displaying the results in a dedicated tab. Information about the total number of records fetched and the execution time is displayed. If the execution fails, appropriate error messages also display in the console window.

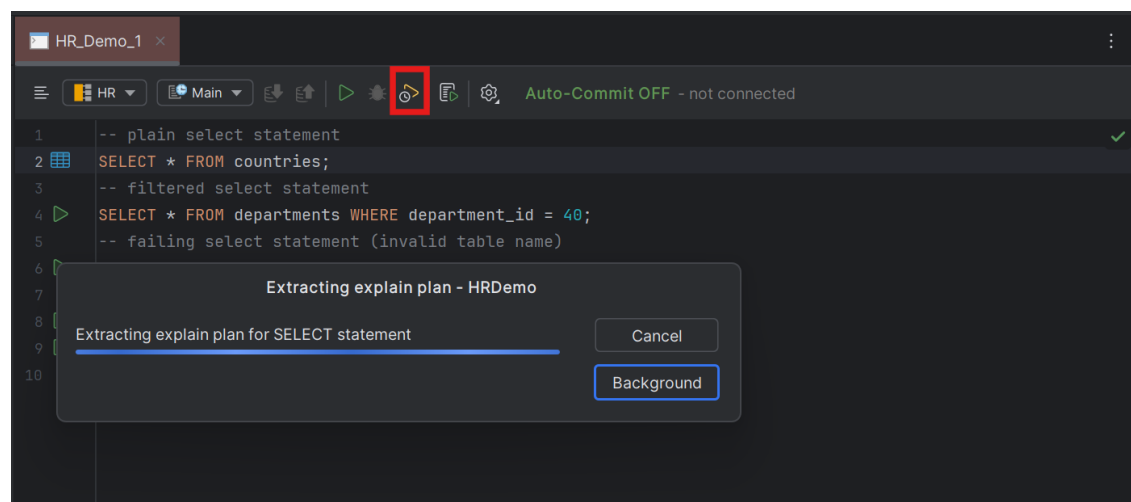


	COUNTRY_ID	COUNTRY_NAME	REGION_ID
1	IT	Italy	10
2	JP	Japan	30
3	US	United States of America	20
4	CA	Canada	20
5	CN	China	30
6	IN	India	30
7	AU	Australia	40
8	ZW	Zimbabwe	50
9	SG	Singapore	30
10	GB	United Kingdom of Great Britain and Northern Ireland	10
11	FR	France	10

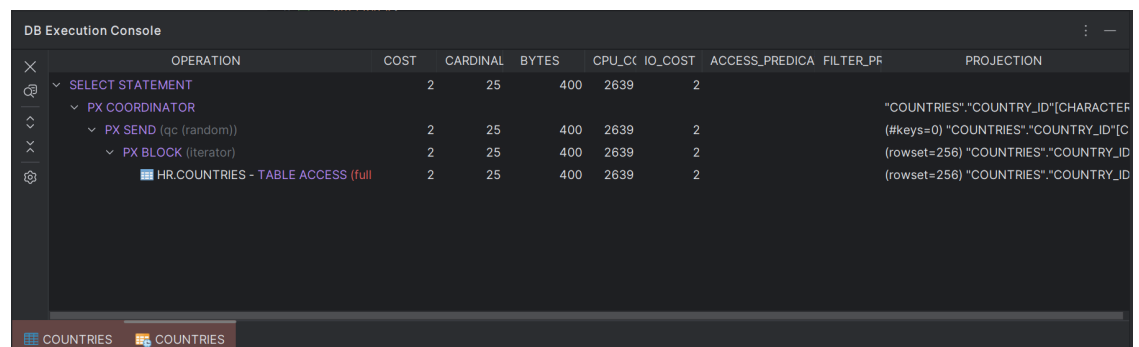
HRDemo (main): 25 records - executed in 496 ms. / fetched in 14 ms.

COUNTRIES

You can also extract and view the execution plan for the SQL statement by clicking the **Execute Plan for Statement** icon on the editor toolbar menu.



The execution plan provides a complete breakdown of the SQL statement with details of the operation performed, cost in terms of resource utilization, projection and predicates and displays it on the **DB Console** window.



	OPERATION	COST	CARDINAL	BYTES	CPU_CK	IO_COST	ACCESS_PREDICA	FILTER_PF	PROJECTION
✓	SELECT STATEMENT	2	25	400	2639	2			
✓	PX COORDINATOR								"COUNTRIES"."COUNTRY_ID"(CHARACTER
✓	PX SEND (qc (random))	2	25	400	2639	2			(#keys=0) "COUNTRIES"."COUNTRY_ID"(C
✓	PX BLOCK (iterator)	2	25	400	2639	2			(rowset=256) "COUNTRIES"."COUNTRY_ID
✓	HR.COUNTRIES - TABLE ACCESS (full)	2	25	400	2639	2			(rowset=256) "COUNTRIES"."COUNTRY_ID

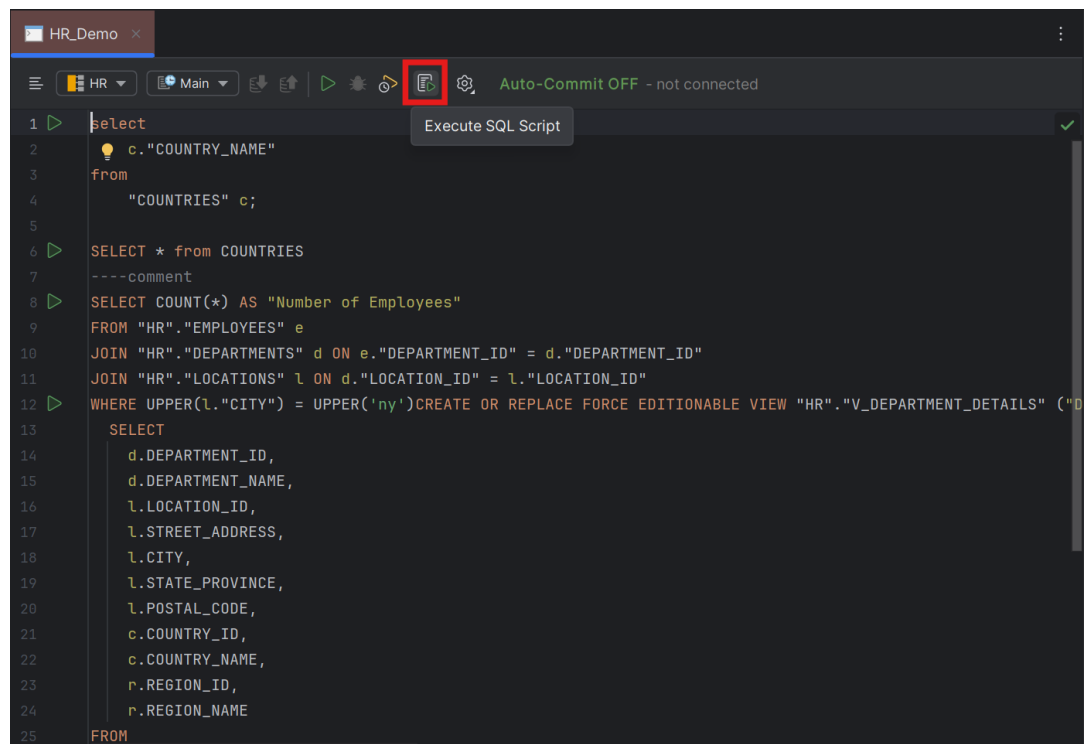
COUNTRIES COUNTRIES

Executing Scripts

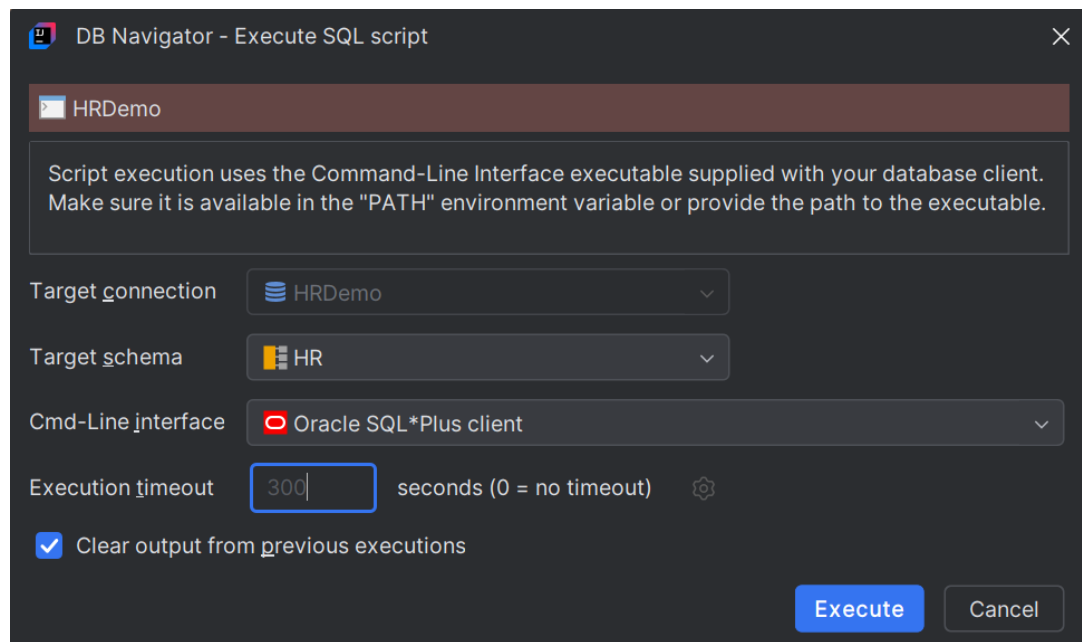
This topic describes the procedure to execute PL/SQL scripts.

The execution engine in the Oracle® Database Navigator tool supports running multiple SQL statements as SQL scripts and display the results in the **DB Execution Console** window. To execute an SQL script in the editor window:

1. Open the database object from the DB Browser pane containing the SQL script to edit in the SQL editor.
2. Write or edit the SQL script.
3. Click the **Execute SQL Script** icon from the toolbar menu of the SQL editor window.



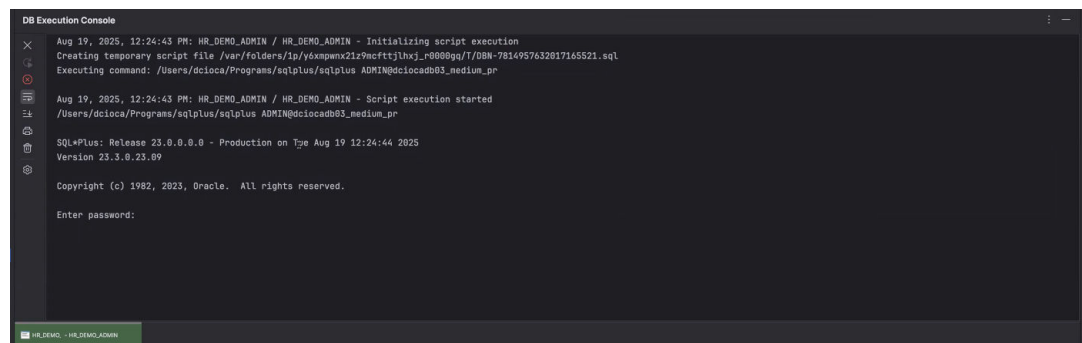
The **DB Navigator - Execute SQL Script** dialog box opens displaying the target database connection and schema.



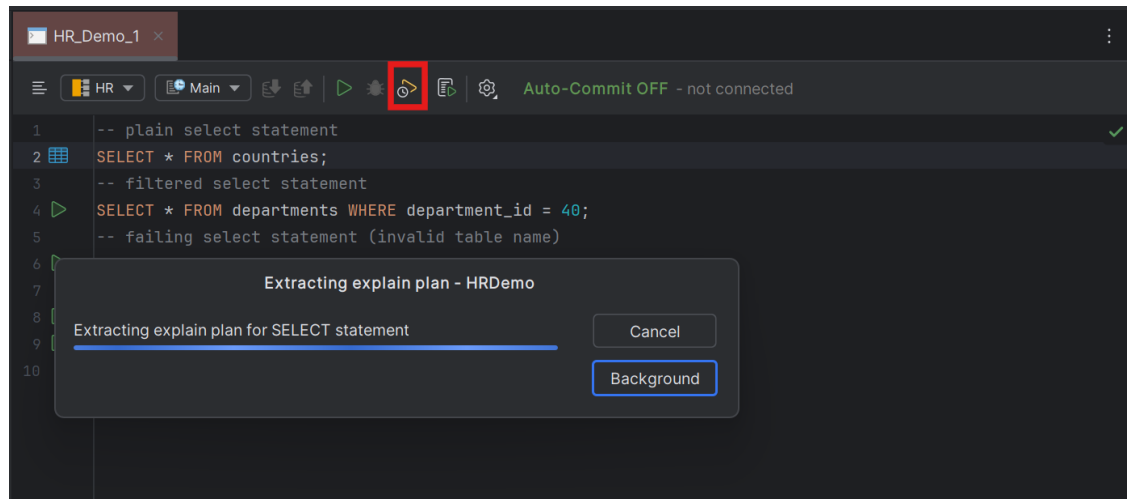
By default, the **Oracle SQL*Plus Client** is used for execution of the script.

4. Click **Execute**.

The **DB Execution Console** window opens displaying the results in a dedicated tab. Information about the total number of records fetched and the execution time is displayed. If the execution fails, appropriate error messages also display in the console window.



You can also extract and view the execution plan for the SQL script by clicking the **Execute Plan for SQL Statement** icon on the editor toolbar menu.



The execution plan provides a complete breakdown of the SQL statement with details of the operation performed, cost in terms of resource utilization, projection and predicates and displays it on the **DB Console** window.

	OPERATION	COST	CARDINALITY	BYTES	CPU_COST	IO_COST	
SELECT STATEMENT		3	1	22	11523	3	
SORT (aggregate)			1	22			
PX COORDINATOR							
PX SEND (qc (random))			1	22			
SORT (aggregate)			1	22			
NESTED LOOPS		3	1	22	11523	3	
NESTED LOOPS		3	1	19	9940	3	
PX BLOCK (iterator)							
HR.LOCATIONS - TABLE ACCESS (full)		2	1	12	4600	2	
HR.DEPARTMENTS - TABLE ACCESS (by index rowid batched)		1	1	7	5340	1	
HR.DEPT_LOCATION_IX - INDEX (range scan)		0	4		917	0	"D"."L"
HR.EMP_DEPARTMENT_IX - INDEX (range scan)		0	4	12	1583	0	"E"."DEPA"

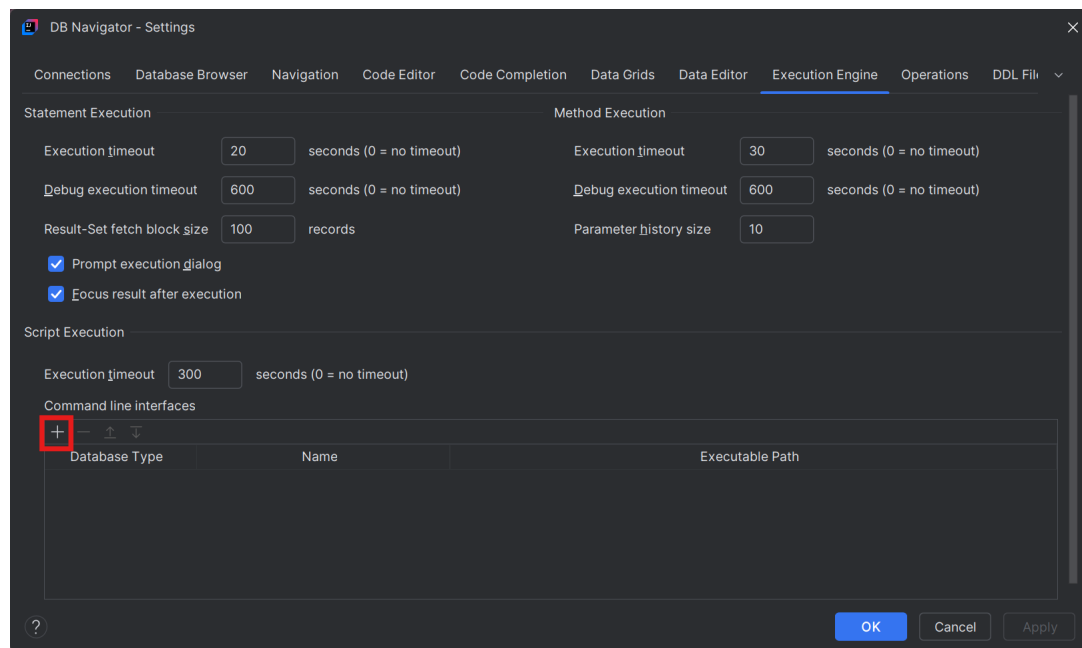
- [Creating Command Line Interfaces for Script Execution](#)

This topic describes the procedure for creating command line interface client in Oracle® Database Navigator.

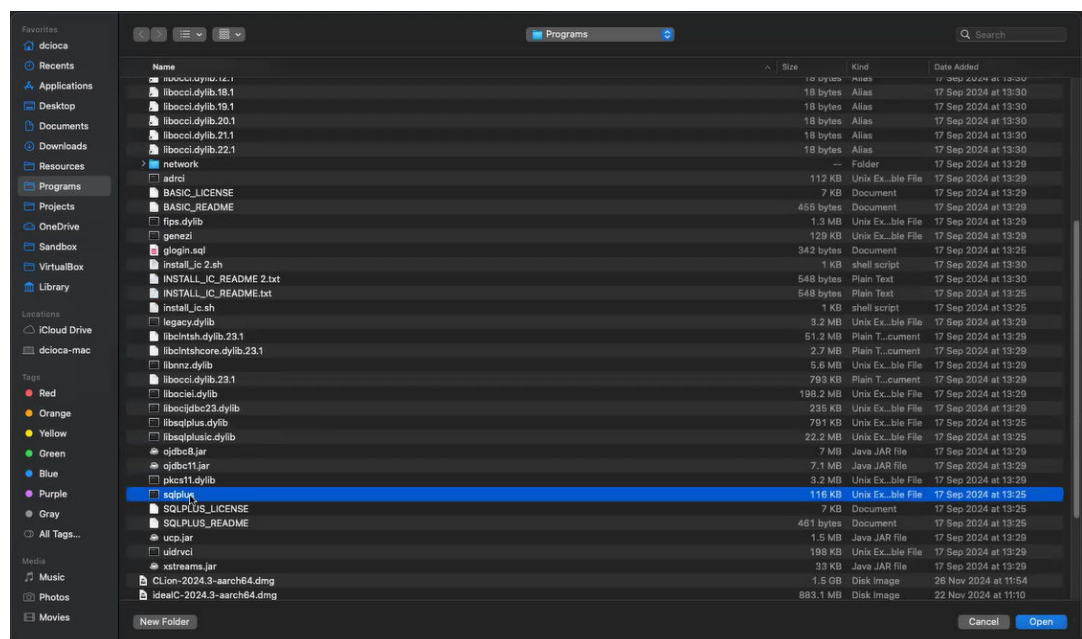
Creating Command Line Interfaces for Script Execution

This topic describes the procedure for creating command line interface client in Oracle® Database Navigator.

1. On the **Script Execution** section of the **Execution Engine** settings tab, click the **Add (+)** icon for **Command Line Interfaces** section.

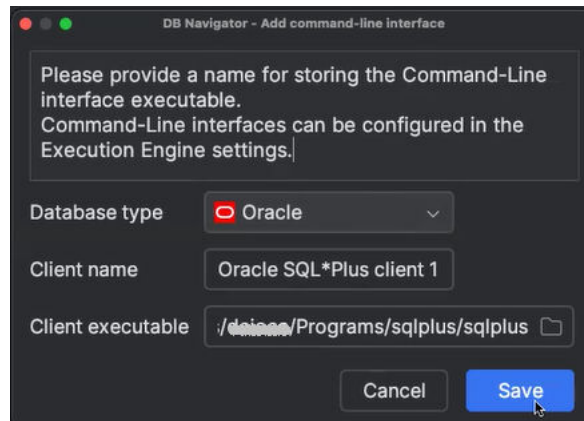


2. Select the type of database you want the map with a command line interface. Supported databases are:
 - Oracle database
 - MySQL
 - PostgreSQL
 - SQLite
3. Select the SQL*Plus executable file stored in your workstation and click **Open**.



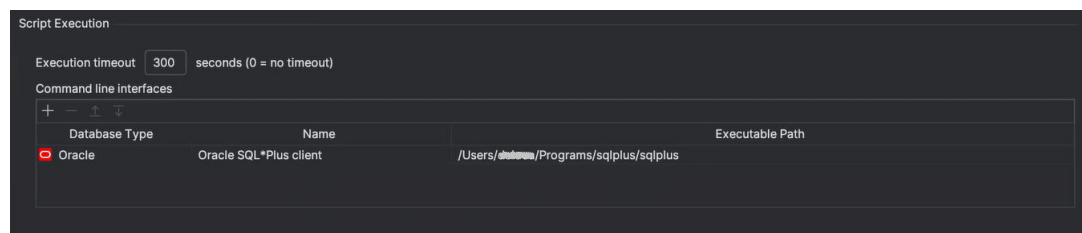
The **DB Navigator - Add Command Line Interface** dialog box opens.

4. Enter the **Client Name**. The **Database Type** and **Client Executable** fields are pre-filled based on your previous selections.



5. Click **Save**.

The new command line interface client for the selected database type is created and added in the Oracle® Database Navigator tool. You can use the stored CLI clients to execute the SQL or PL/SQL scripts in the terminal.

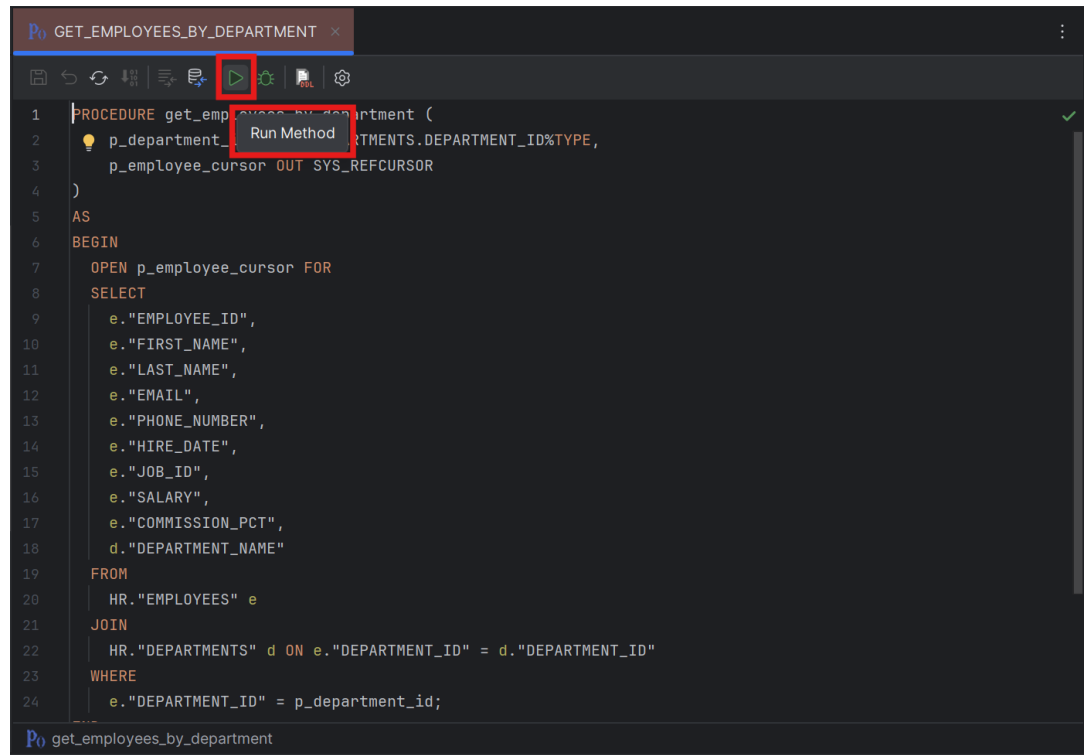


Executing Methods

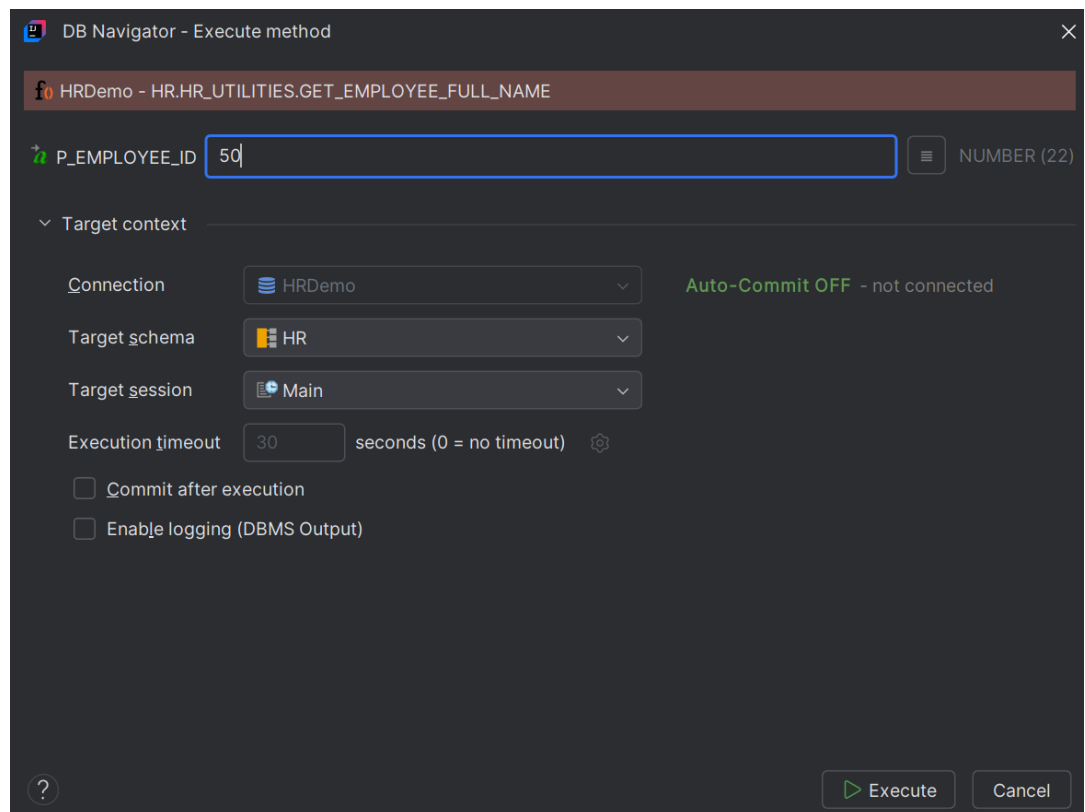
This topic describes the procedure to execute methods or functions.

Method execution in Oracle® Database Navigator tool helps in executing complex data types such as procedures or functions. The results of the executed method is displayed on the DB Execution Console window. To run a method (function or procedure):

1. Open the database object, such as a procedure or function, from the DB Browser pane program editor window.
2. Write or edit the method (database function or procedure).
3. Click the **Run Method** icon from the toolbar menu of the program editor window.

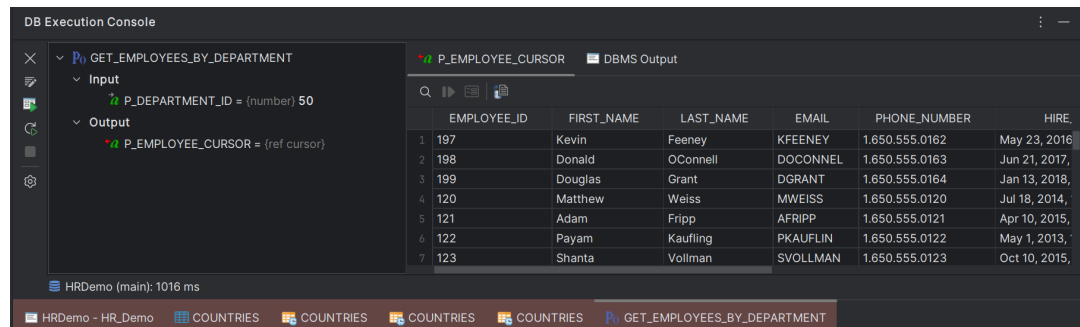


The **DB Navigator - Execute Method** dialog box opens with details of the target database connection, schema, and session in which the method will be run.



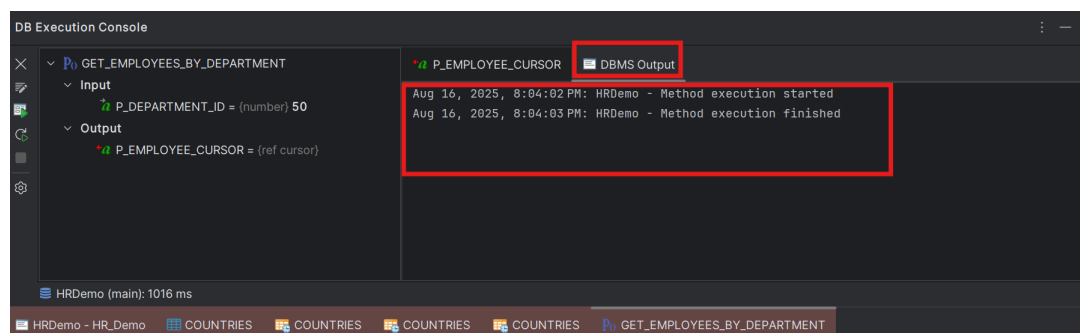
4. Enter the value of the input parameter in the text box. The permissible character type and max character length for the input parameter displays next to the text box. Clicking the **Possible values** icon displays the history of parameter values used for previous method execution.
5. In the **Target Context** section, you can select a different **Target Schema** and **Target Session** from the available options to execute the method.
6. Select the **Commit after execution** check box to auto-commit the execution transaction in the database.
7. Select the **Enable Logging (DBMS Output)** check box if you want to capture the log event for this method execution.
8. Click **Execute**.

The results of the executed method displays in the **DB Execution Console** window. The results include the method input and its output along with the fetched records corresponding to the output in a separate tab.



	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE
1	197	Kevin	Feeney	KFEENEY	1.650.555.0162	May 23, 2016
2	198	Donald	OConnell	DOCONNEL	1.650.555.0163	Jun 21, 2017
3	199	Douglas	Grant	DGRANT	1.650.555.0164	Jan 13, 2018
4	120	Matthew	Weiss	MWEISS	1.650.555.0120	Jul 18, 2014
5	121	Adam	Fripp	AFRIPP	1.650.555.0121	Apr 10, 2015
6	122	Payam	Kauffman	PKAUFMAN	1.650.555.0122	May 1, 2013
7	123	Shanta	Vollman	SVOLLMAN	1.650.555.0123	Oct 10, 2015

If **Enable logging (DBMS Output)** option was enabled, the **DBMS Output** tab displays the method execution event statistics.



Log Event
Aug 16, 2025, 8:04:02 PM: HRDemo - Method execution started
Aug 16, 2025, 8:04:03 PM: HRDemo - Method execution finished

From the DB Execution Console toolbar menu options, you can edit the method (in the editor), execute the method again, open the execution dialog box to change the input parameters or target context. Furthermore, you can export the records fetched in the result and search for a specific record and view record details.

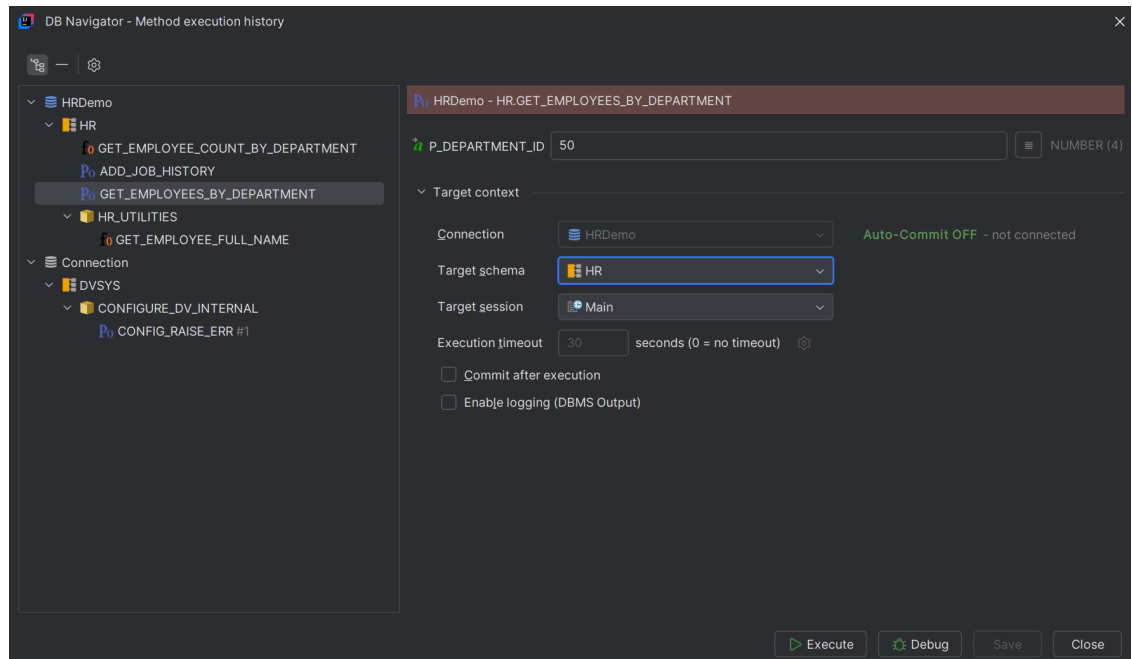
- [Method Execution History](#)

This topic provides an overview of maintaining a history of input parameters for executed methods.

Method Execution History

This topic provides an overview of maintaining a history of input parameters for executed methods.

You can save the parameters you enter to execute the methods and group them into programs. The maximum history size you can save for a method is configurable. To access the **Method Execution History**, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Method Execution History**.



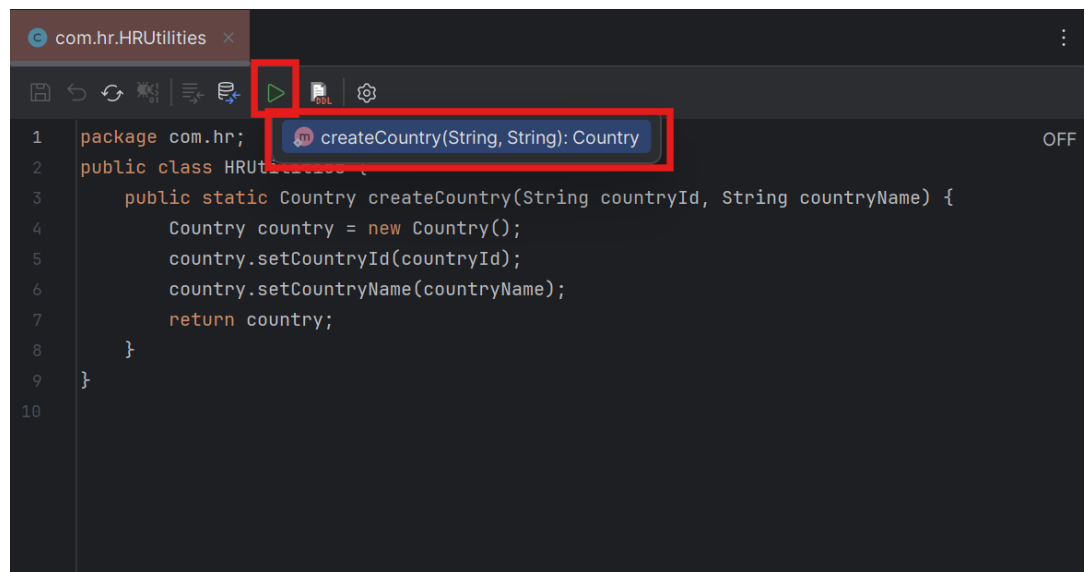
Clicking the **Possible Values** icons next to the input parameter displays all the saved execution parameter history for the method.

Executing Java Programs

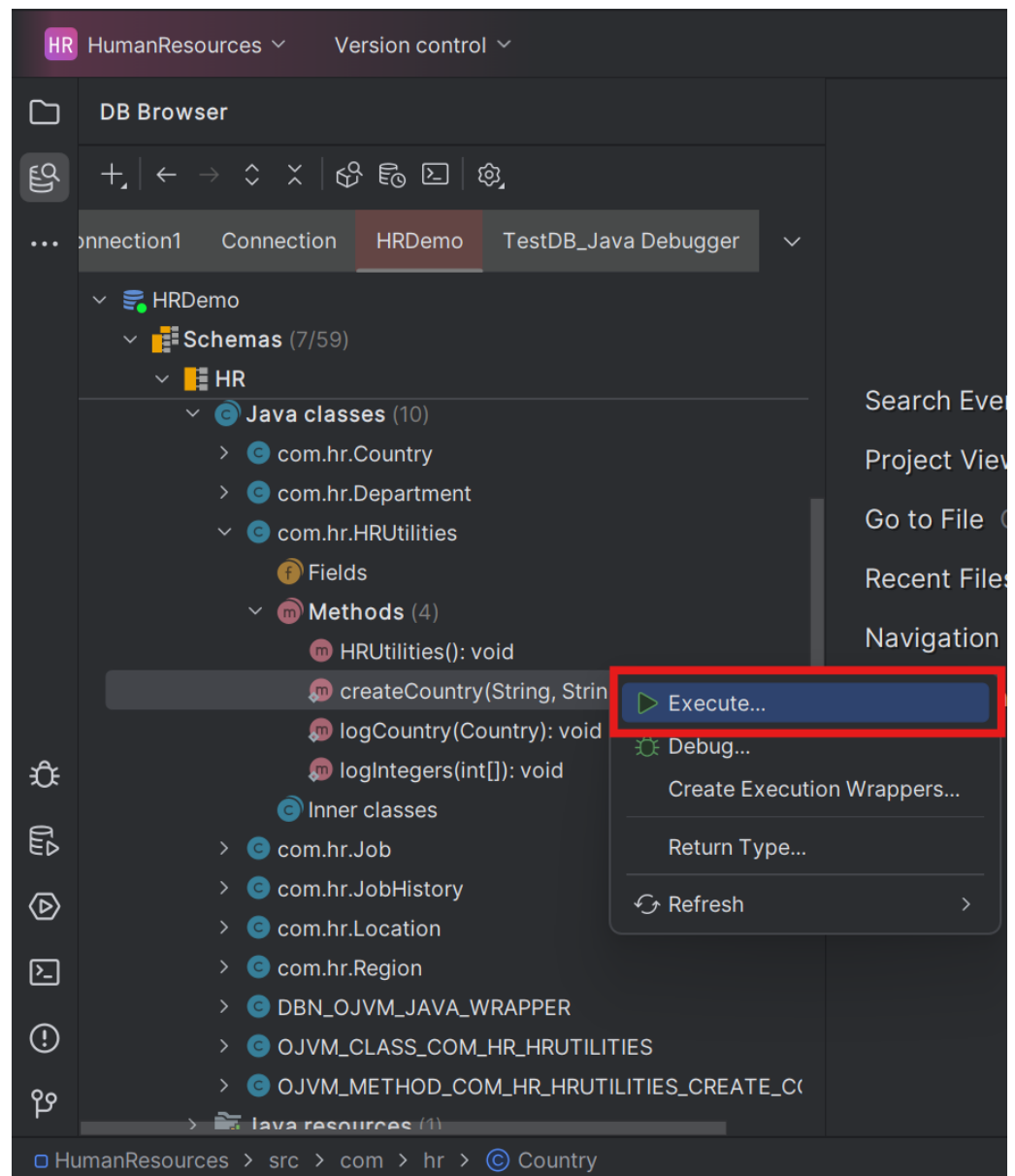
This topic describes the procedure to execute Java programs.

Oracle® Database Navigator tool enables you to compile and execute Java programs and display the result on the **DB Execution Console** window. To run a Java method:

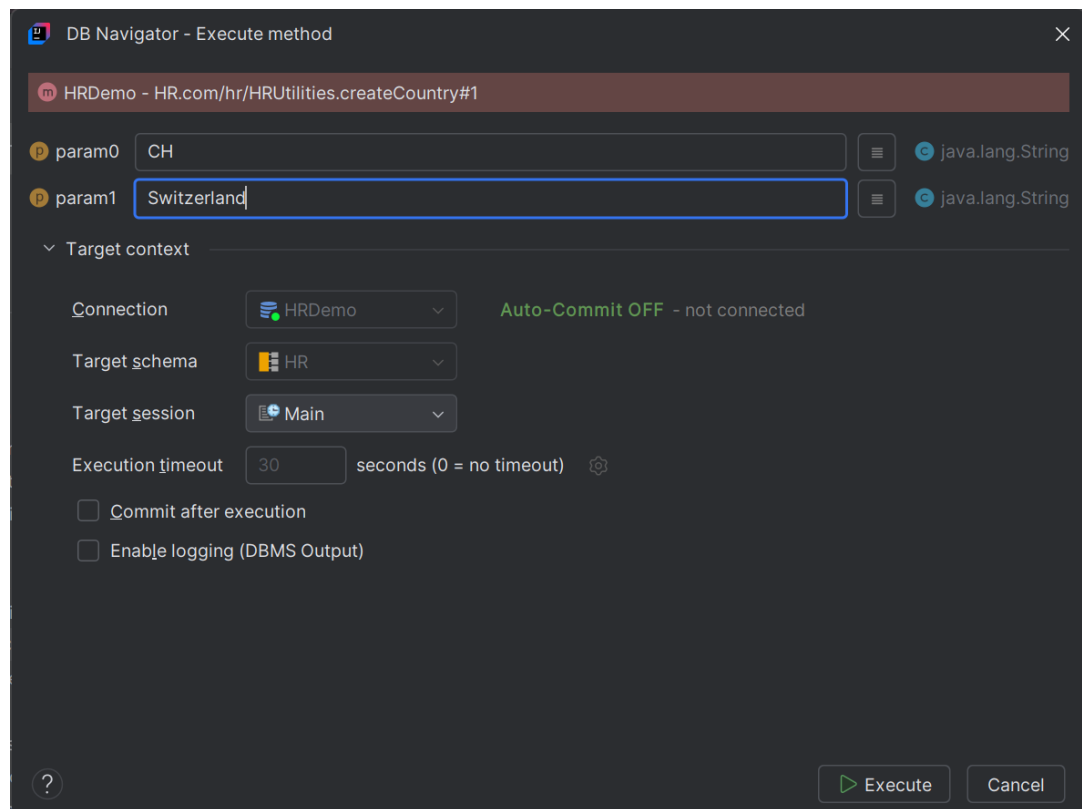
1. Open the Java object class from the DB Browser window in the Java editor.
2. Click the **Execute Method** icon from the toolbar menu of the Java editor
3. Select the public static method in the Java class file you want to run.



- Alternatively, from the DB Browser window, right-click the Java Class file (or a public static method within it) and select **Execute** from the context menu.

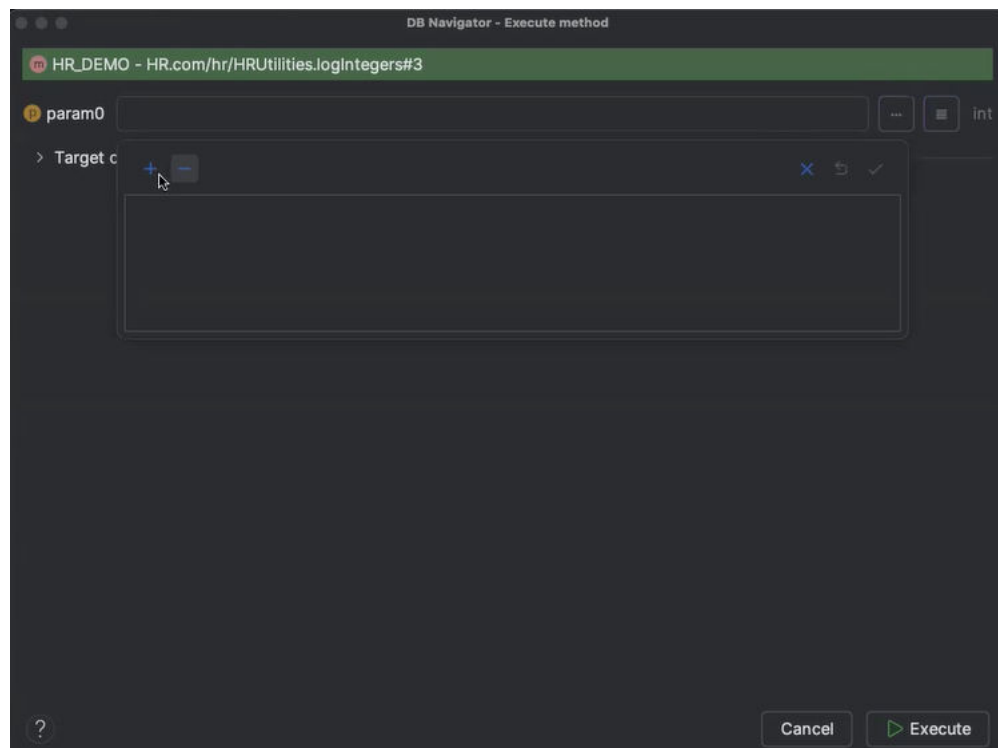


The **DB Navigator - Execute Method** dialog box opens with details of the target database connection, schema, and session in which the Java method will be run.

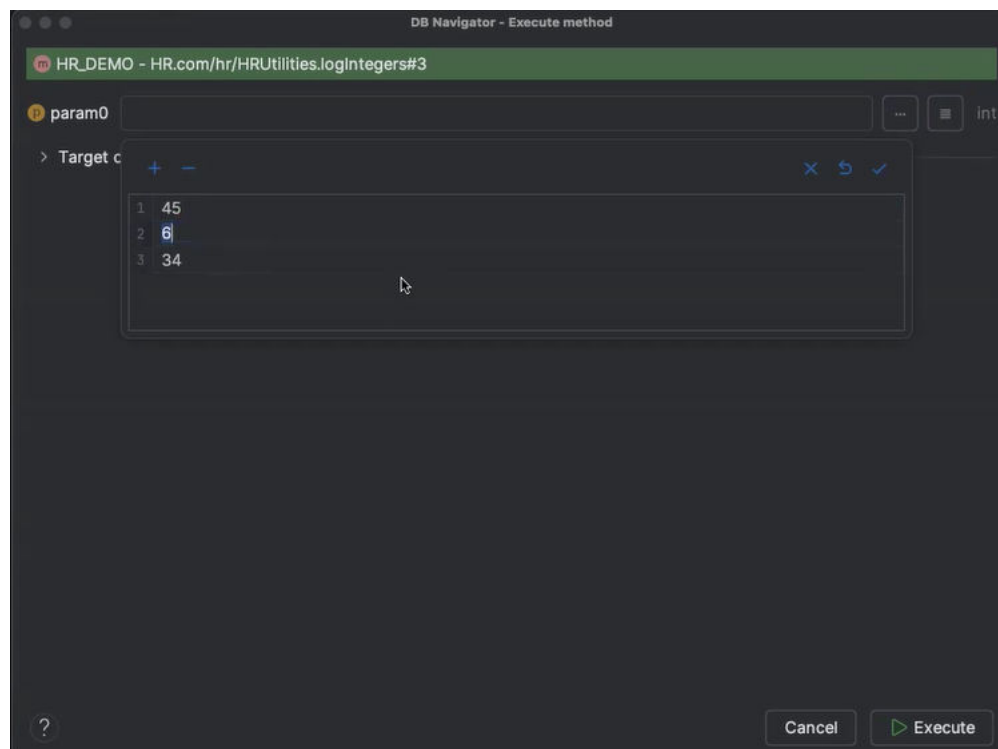


4. Enter the values of the input parameters in the text box. The permissible character type and max character length for the input parameter(s) displays for each text box. Clicking the **Open Value History** icon displays the history of parameter values used for previous Java method execution.

If the input parameter is defined as type array, then clicking the ellipsis (...) icon next to the parameter field opens the **Array Editor**.



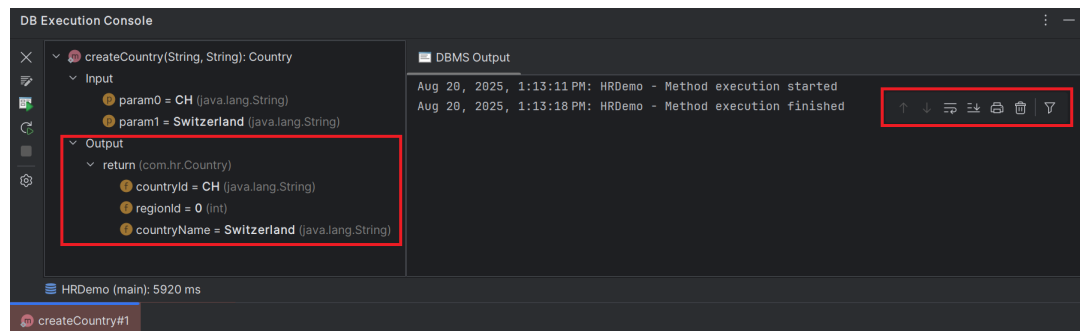
You can add rows in to insert the values to the array (of the declared data type) and save the entry. The input parameter field displays the entered array of values.



5. In the **Target Context** section, you can select a different **Target Schema** and **Target Session** from the available options to execute the method.

6. Select the **Commit after execution** check box to auto-commit the execution transaction in the database.
7. Select the **Enable Logging (DBMS Output)** check box to capture the execution events in database logs.
8. Click **Execute**.

Once the execution is successfully complete, the results of the executed method displays in the **DB Execution Console** window. The results include the method input parameter(s) and its output string.



If the **Enable logging (DBMS Output)** option was enabled, the DBMS Output tab displays the method execution event statistics.

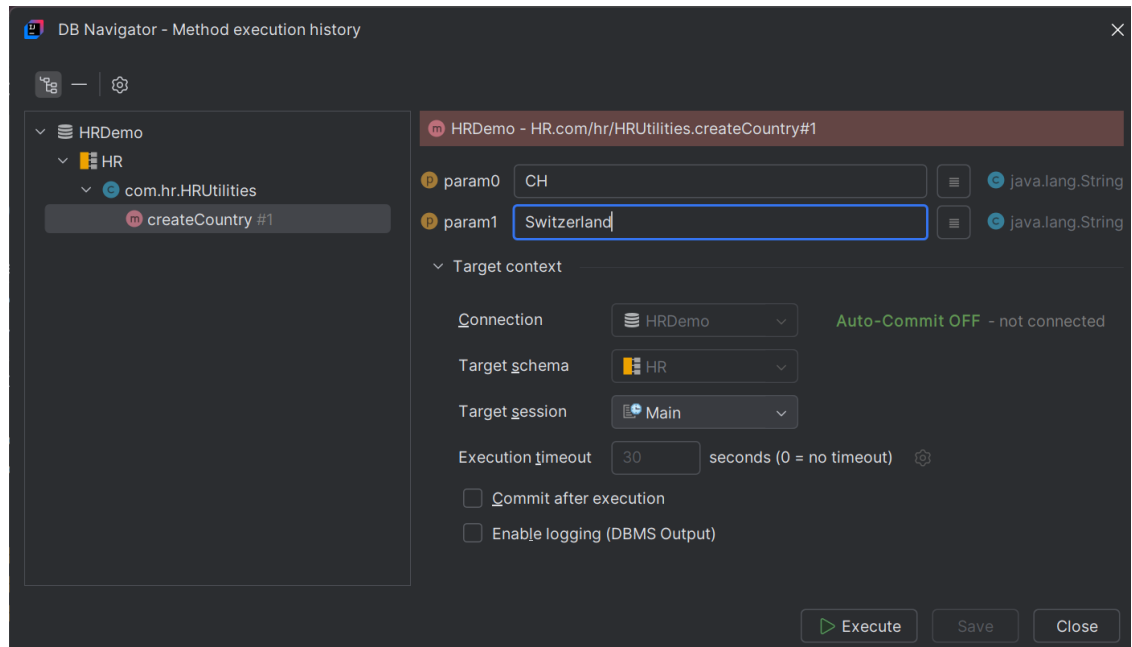
- [Java Execution History](#)
This topic provides an overview of maintaining a history of input parameters for executed Java programs.
- [Creating Java Execution Wrappers](#)
This topic describes the procedure for creating Java execution wrappers in Oracle® Database Navigator.
- [Project Code Base Synchronization](#)
This topic provides an overview of synchronizing Java code base in a Java project.

Java Execution History

This topic provides an overview of maintaining a history of input parameters for executed Java programs.

The **Java Execution History** feature enables you to store up to a configurable number of input parameter values for executing Java programs. You can save the input parameters and target context values to execute Java method and group them by program. The maximum history size you can save is configurable.

To open the **DB Navigator - Method Execution History** dialog box, from the Main menu of Oracle® Database Navigator, select **DB Navigator > Java Execution History**.



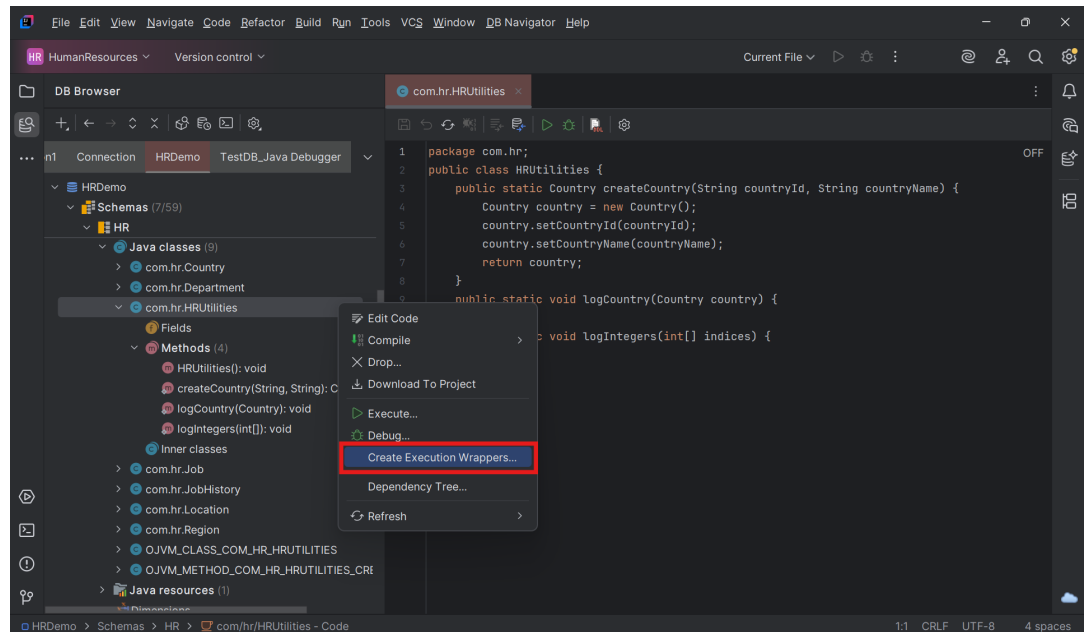
Clicking the **Possible Values** icons next to the input parameter text box(es) display all the saved execution parameter history for the Java method.

Creating Java Execution Wrappers

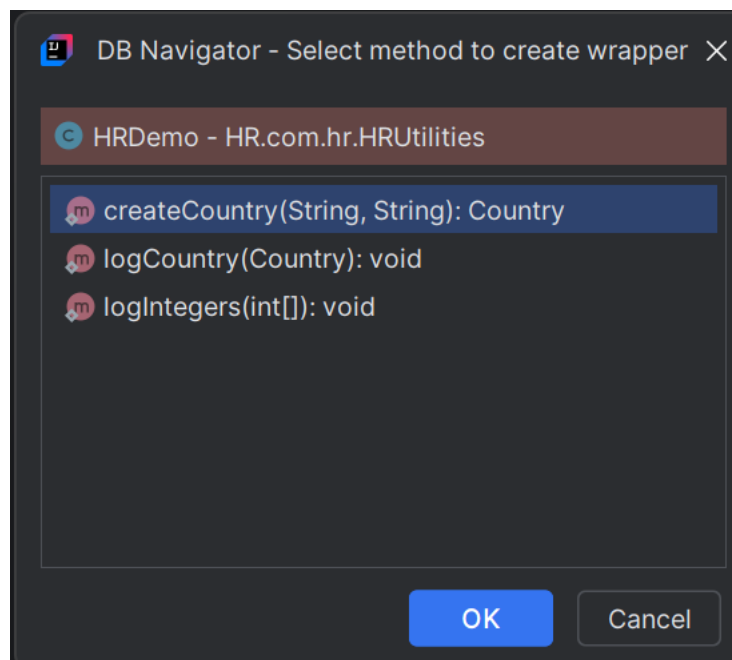
This topic describes the procedure for creating Java execution wrappers in Oracle® Database Navigator.

You can create Java wrappers for executing Java programs stored in Oracle databases using OJVM. A public static method/public static void method can be the entry point for running a Java program on OJVM. Since the Java program is called using an SQL procedure/function, SQL arguments need to be changed to Java arguments, while Java return object must be changed to SQL object. Oracle® Database Navigator (with OJVM support) carries out this conversion by creating Java wrapper method around a public static method. Follow these steps to create Java execution wrappers around Java methods:

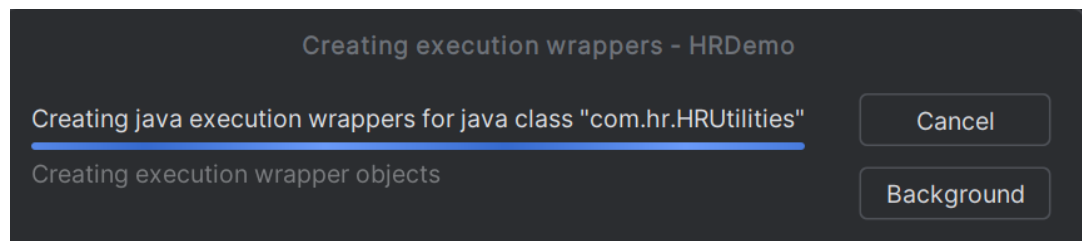
1. From the DB Browser window, expand the schema containing the Java class file you want to execute.
2. Right-click the Java class file and select **Create Execution Wrapper** option from the context menu.



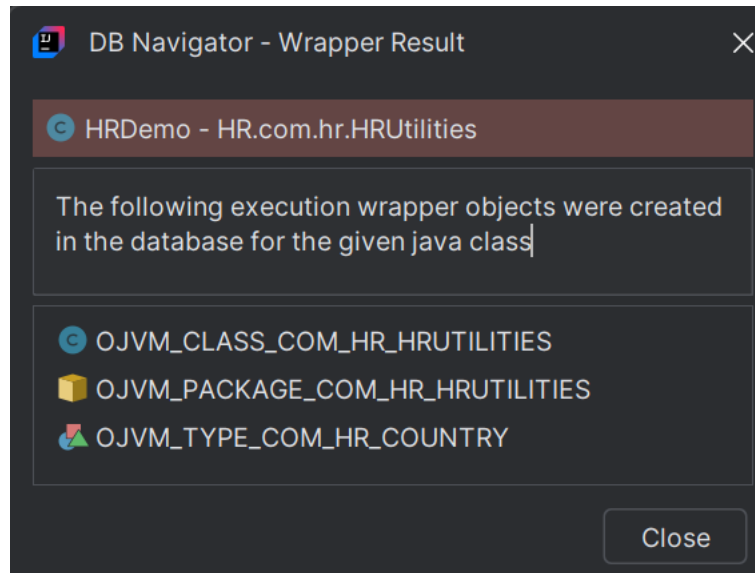
3. Select the method(s) for which you want to create the wrapper from the dialog box that opens and click **OK**.



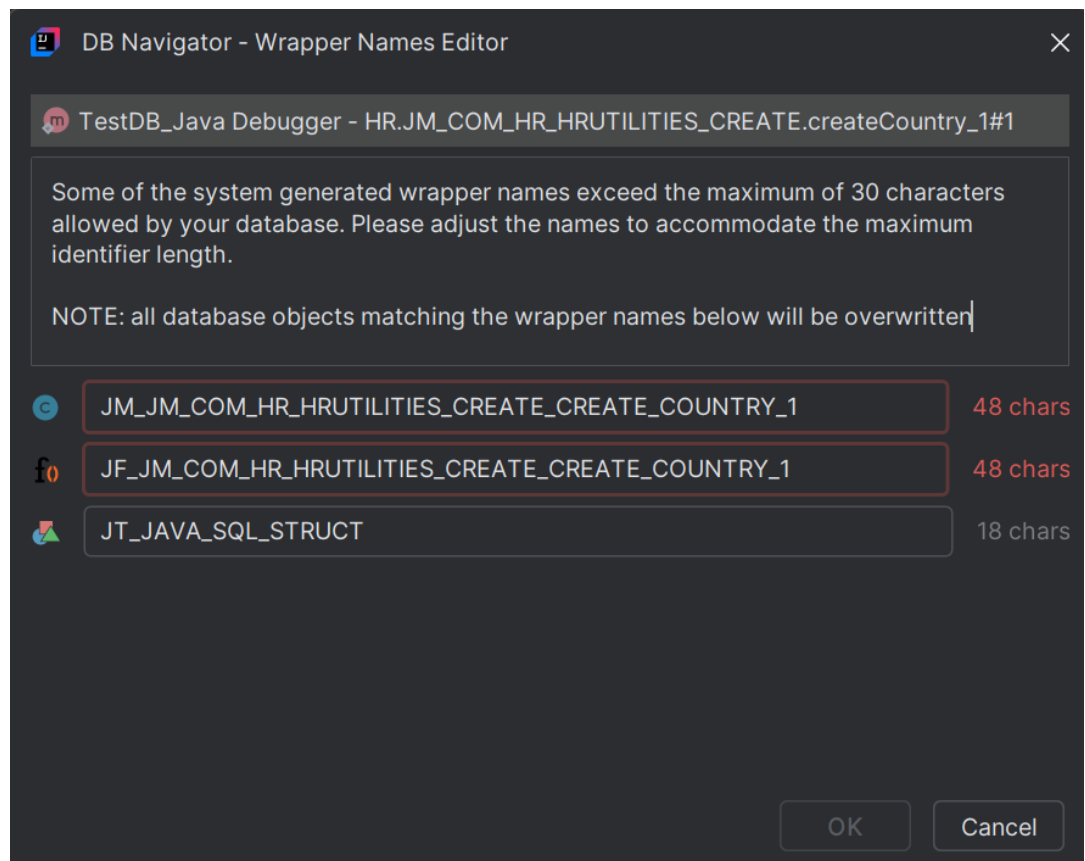
The wrapper creation process starts.



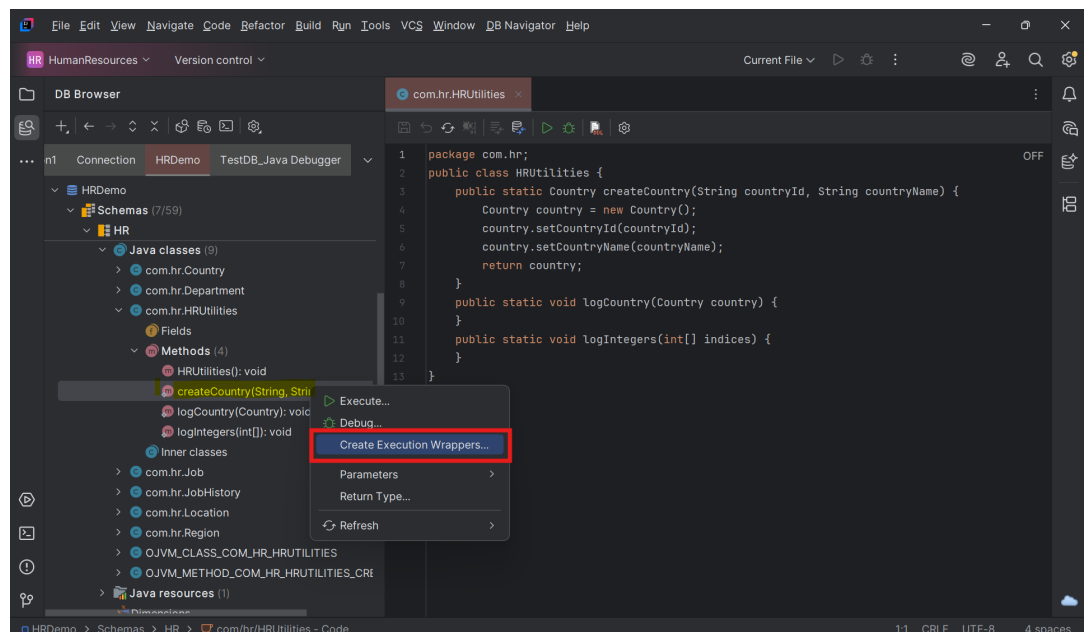
Once the execution wrappers are successfully created, the **DB Navigator - Wrapper Result** dialog box lists the wrapper objects.



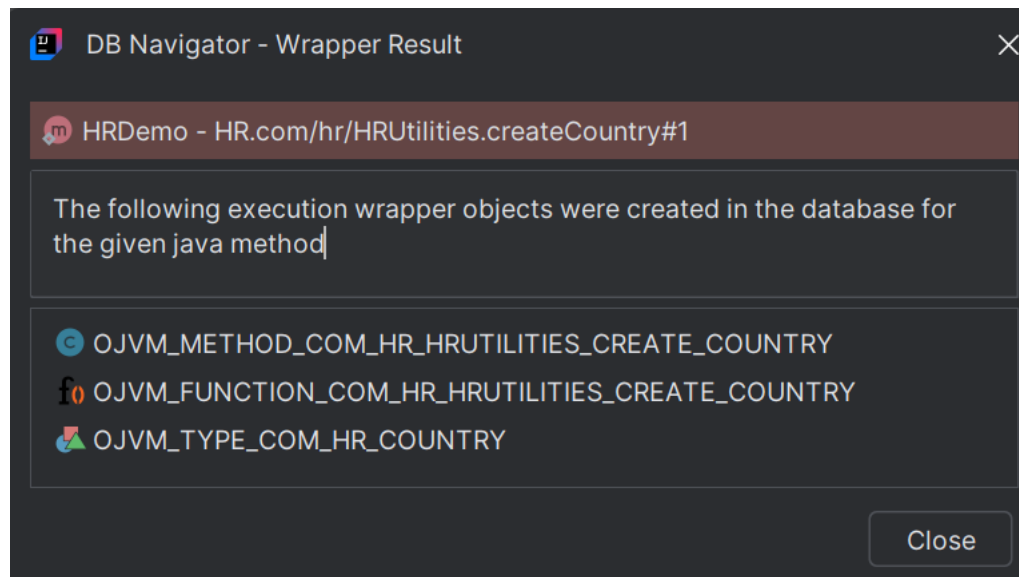
4. If the system-generated wrapper names exceed the maximum identifier length defined for the database, adjust the names in the **DB Navigator - Wrapper Names Editor** dialog box that displays in such cases.



- To create a wrapper directly for a public static method within the Java class file, expand the Methods in the required Java Class and select **Create Execution Wrapper** option from the context menu of that method.



- Once the wrappers are successfully created, the **DB Navigator - Wrapper Result** dialog box lists the wrapper objects for the given method.



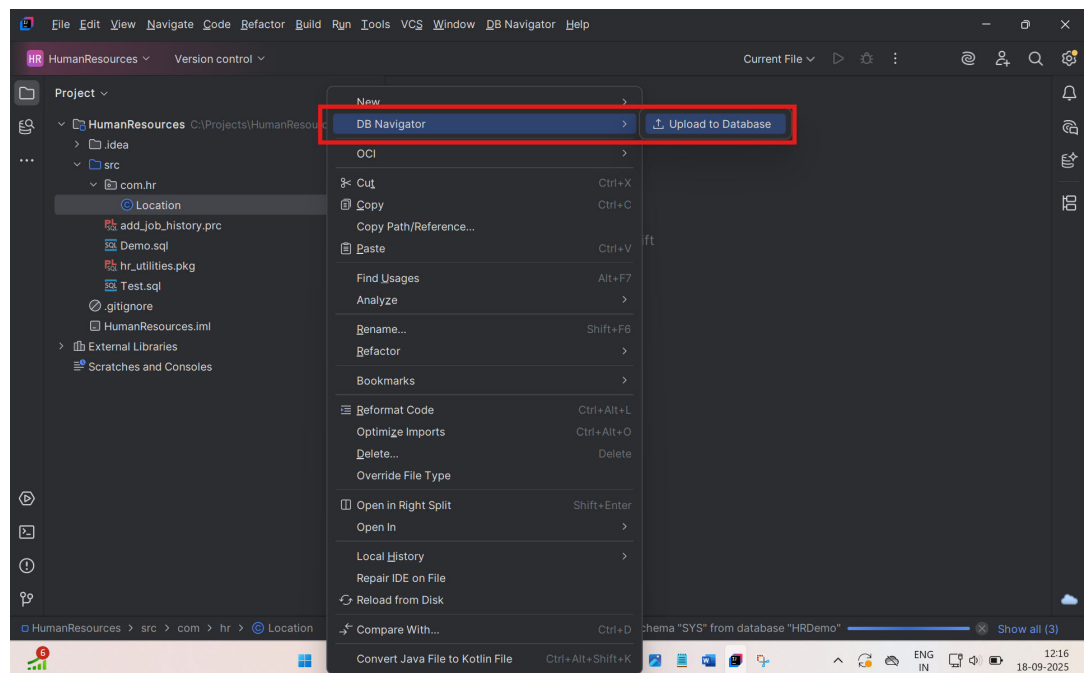
Project Code Base Synchronization

This topic provides an overview of synchronizing Java code base in a Java project.

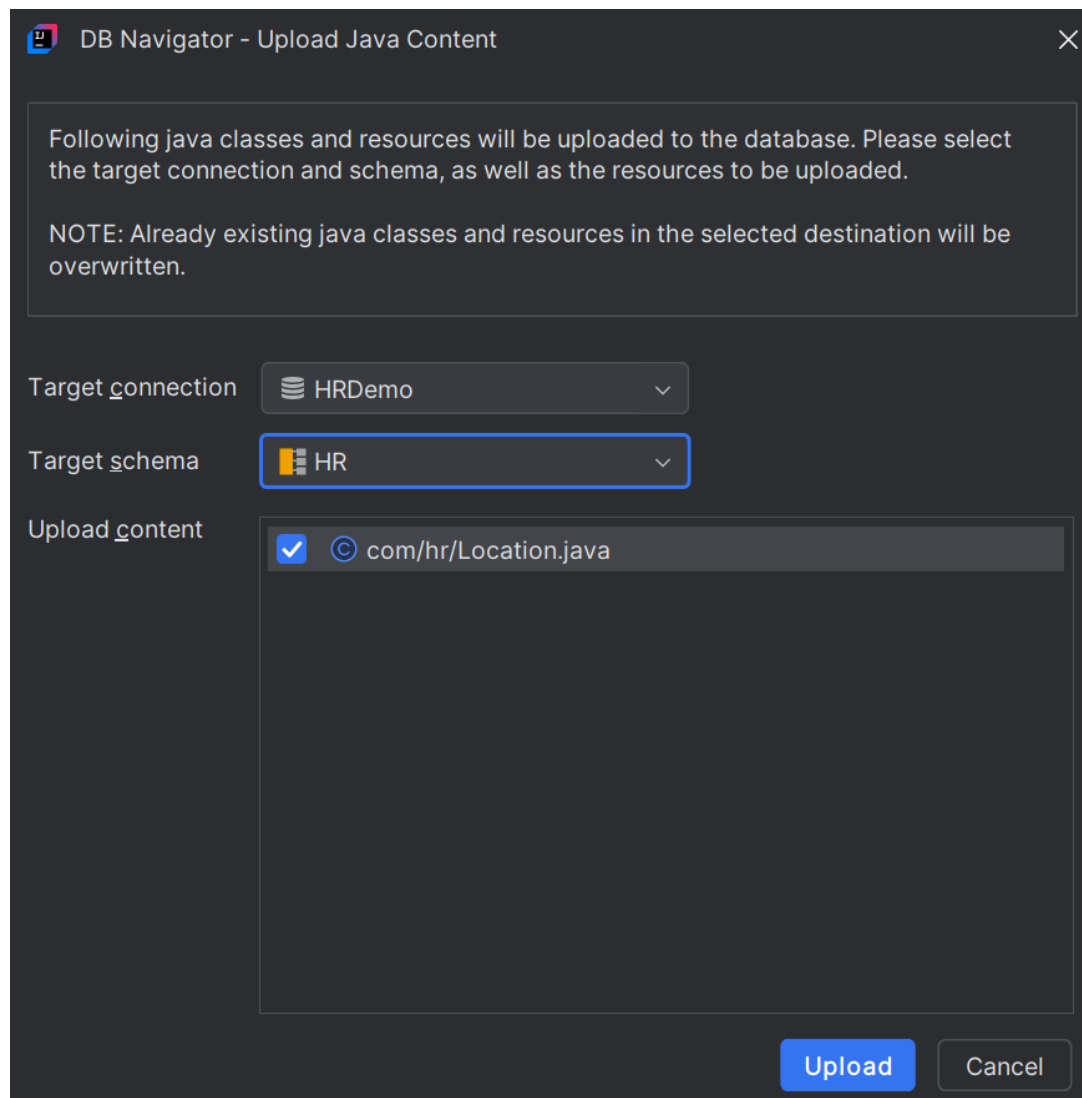
Executing Java programs in Oracle databases using Oracle Java Virtual Machine (OJVM), requires loading the Java source files or Java classes and resources into the database schema. With OJVM support added for Oracle® Database Navigator plug-in, you can upload/download Java content from your Java project to a database connection and vice versa. This facilitates synchronization of your Java code base with the database connection within a project.

Follow these steps to load Java files into a database schema:

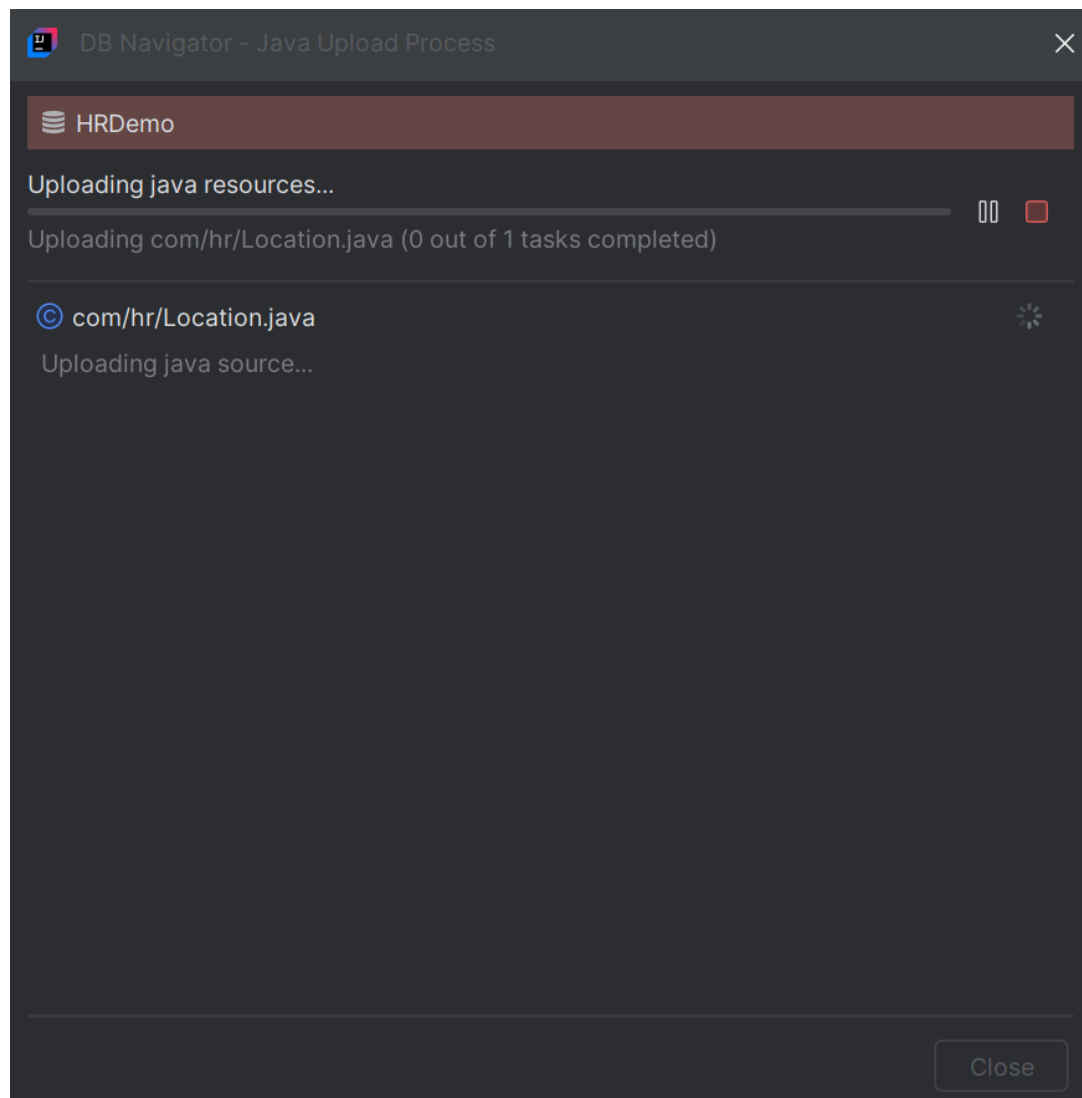
1. In the IDE platform, open the Project folder that contains the Java class/source/resource files.
2. Right-click the Java file and select **DB Navigator > Upload to Database** from the context menu.



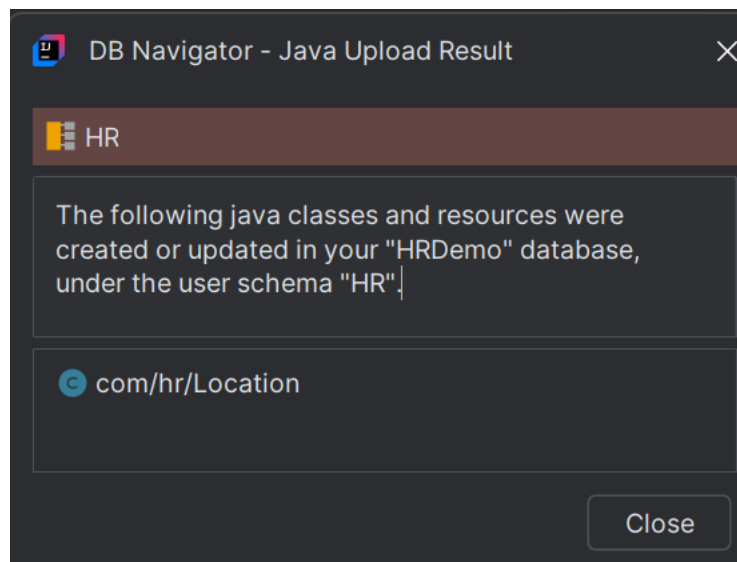
The DB Navigator - Upload Java Content window opens.



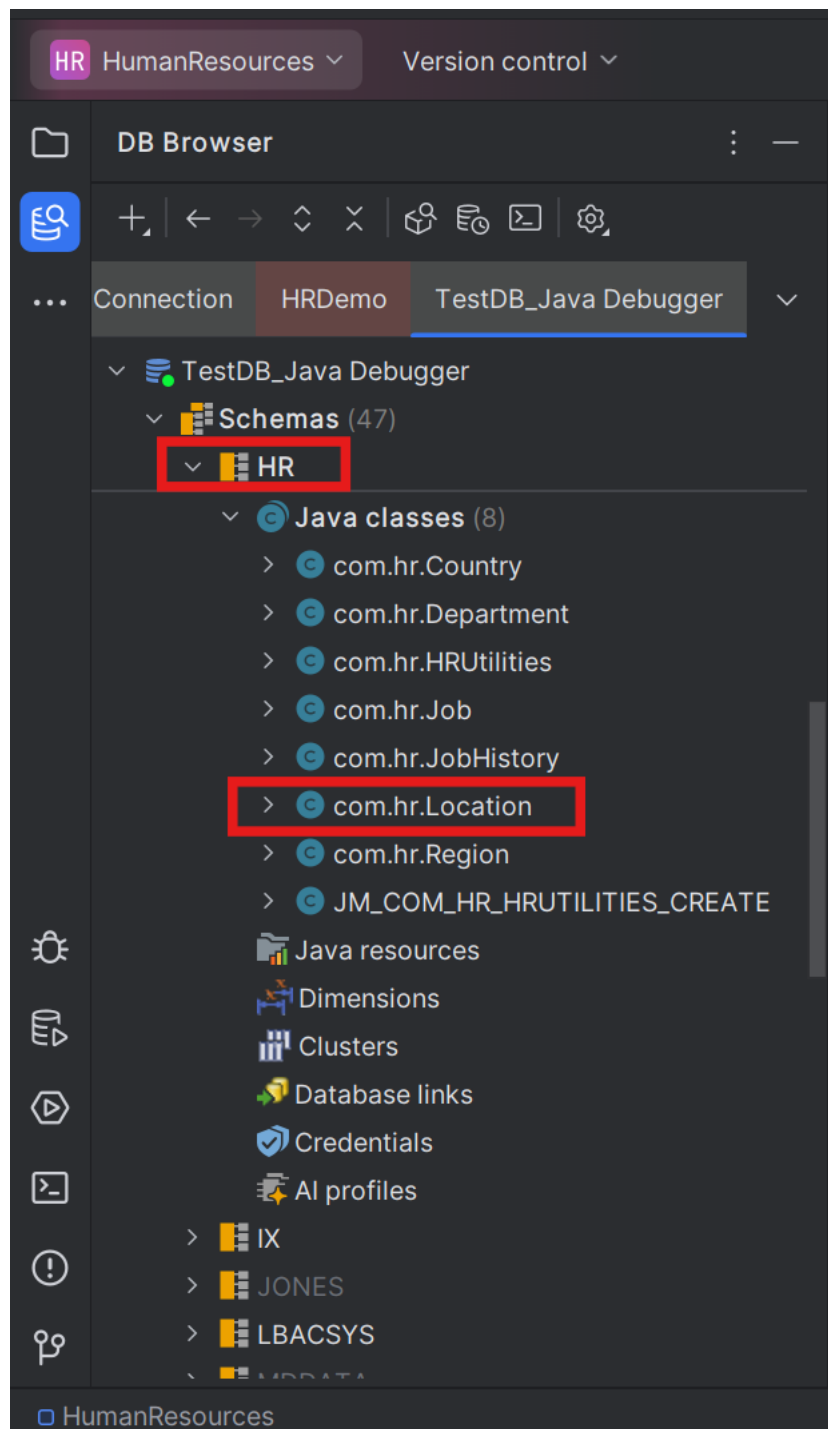
3. From the drop-down fields, select the **Target Connection** and **Target Schema** to which you want to upload the Java classes and resources.
4. Select the required java content check box(es) from the files/resources listed in the **Upload content** section.
5. Click **Upload**. The upload process begins. Once successfully completed, the **DB Navigator - Java Upload Process** window displays the status.



6. Click **Show Results** to view all the Java classes and resources uploaded to the selected DB schema in the **DB Navigator - Java Upload Result** dialog box.

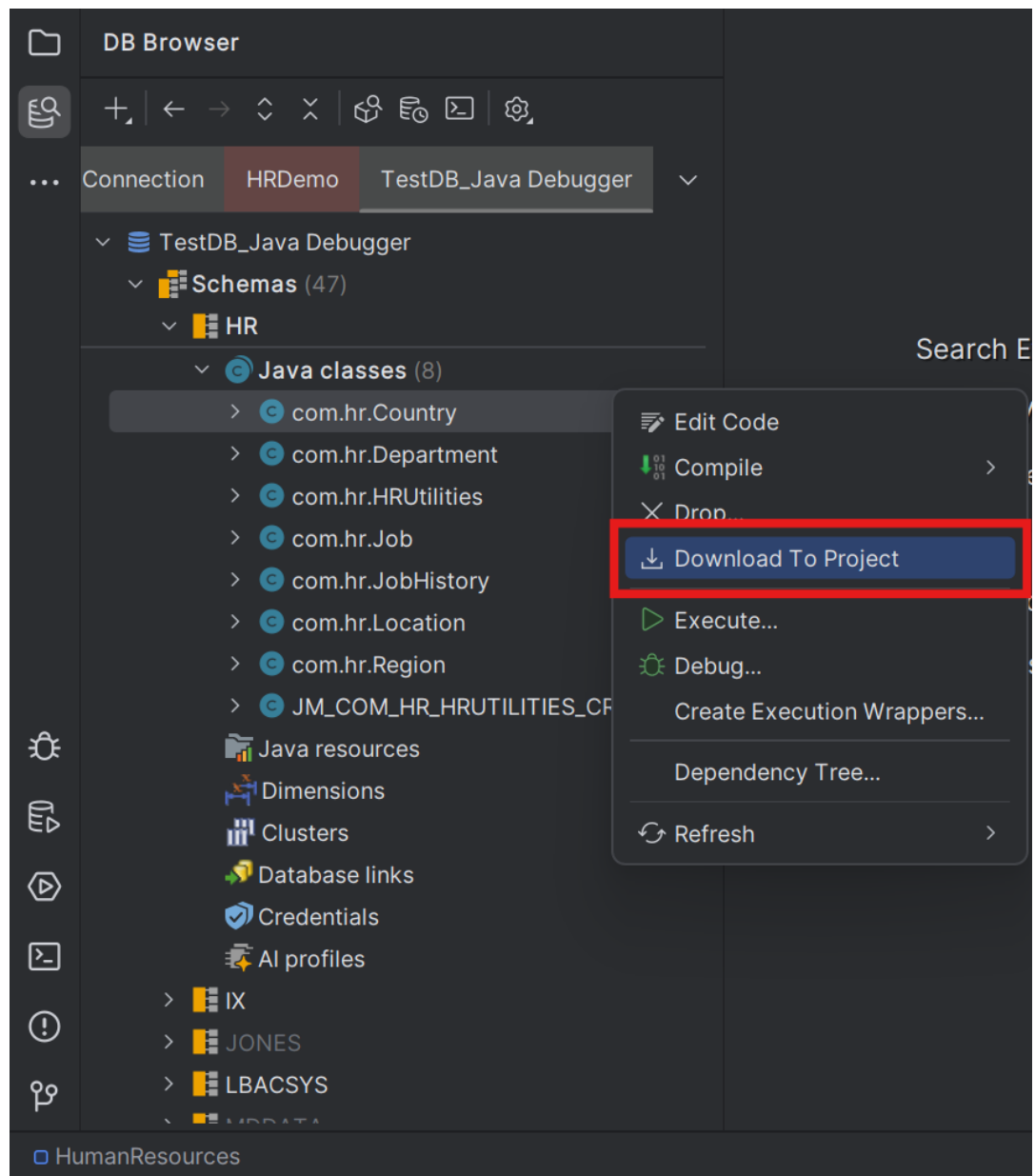


7. Click **Close**.
8. Open the **DB Browser** window and navigate to the target DB schema to verify the uploaded Java content.

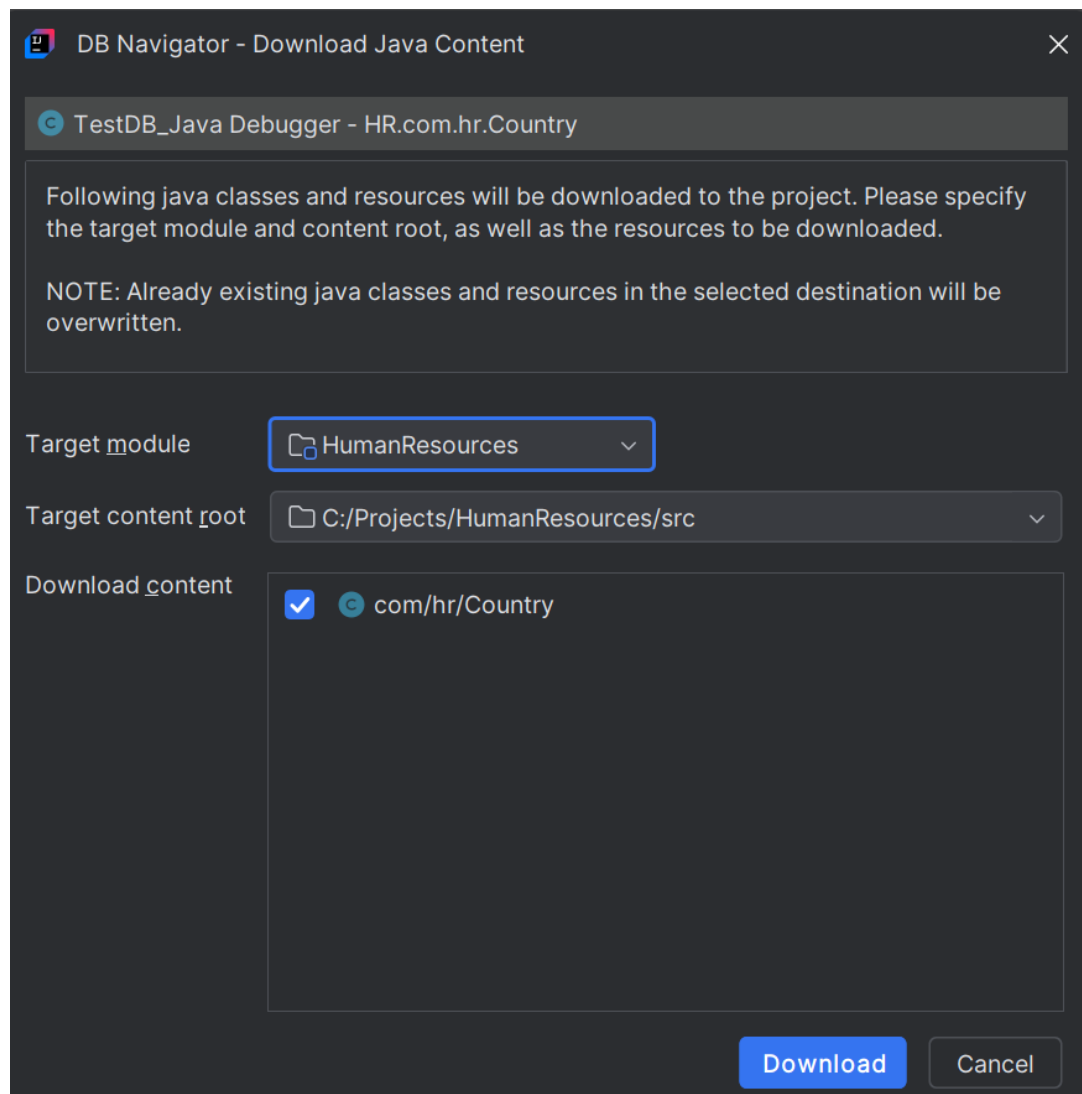


To download Java files and Java resources from a database schema to your project folder:

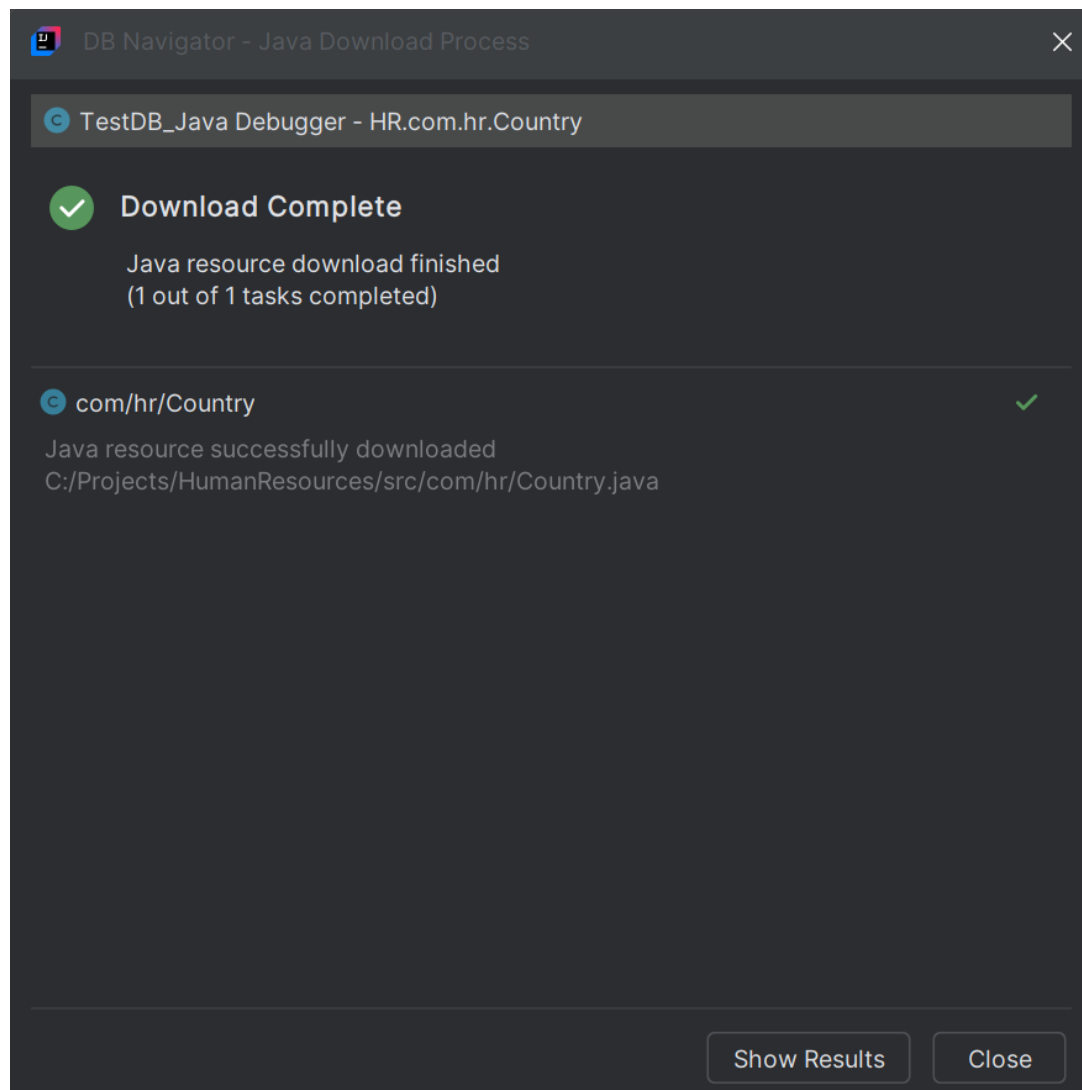
1. Open the DB Browser window and navigate to the Java class file/source file or Java resource in the DB schema.
2. Right-click the Java content you want to download and select **Download to Project** option from the context menu.



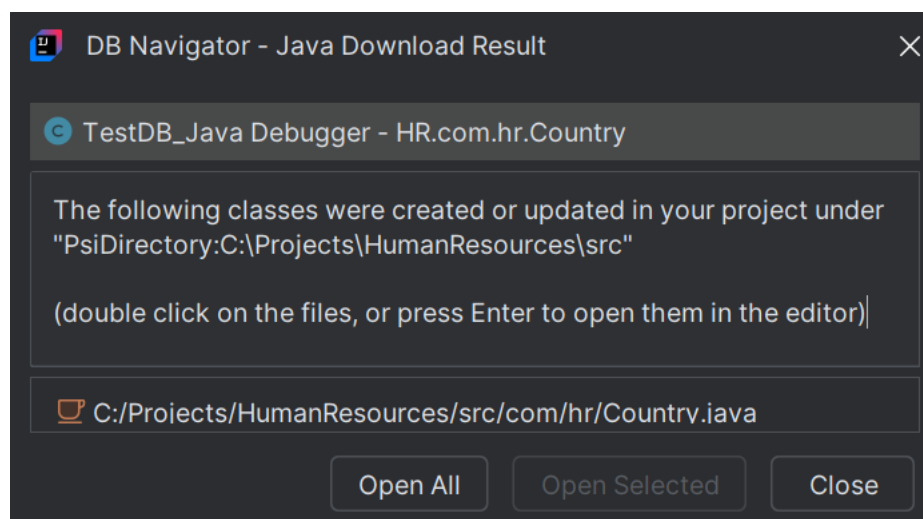
The **DB Navigator - Download Java Content** window opens.



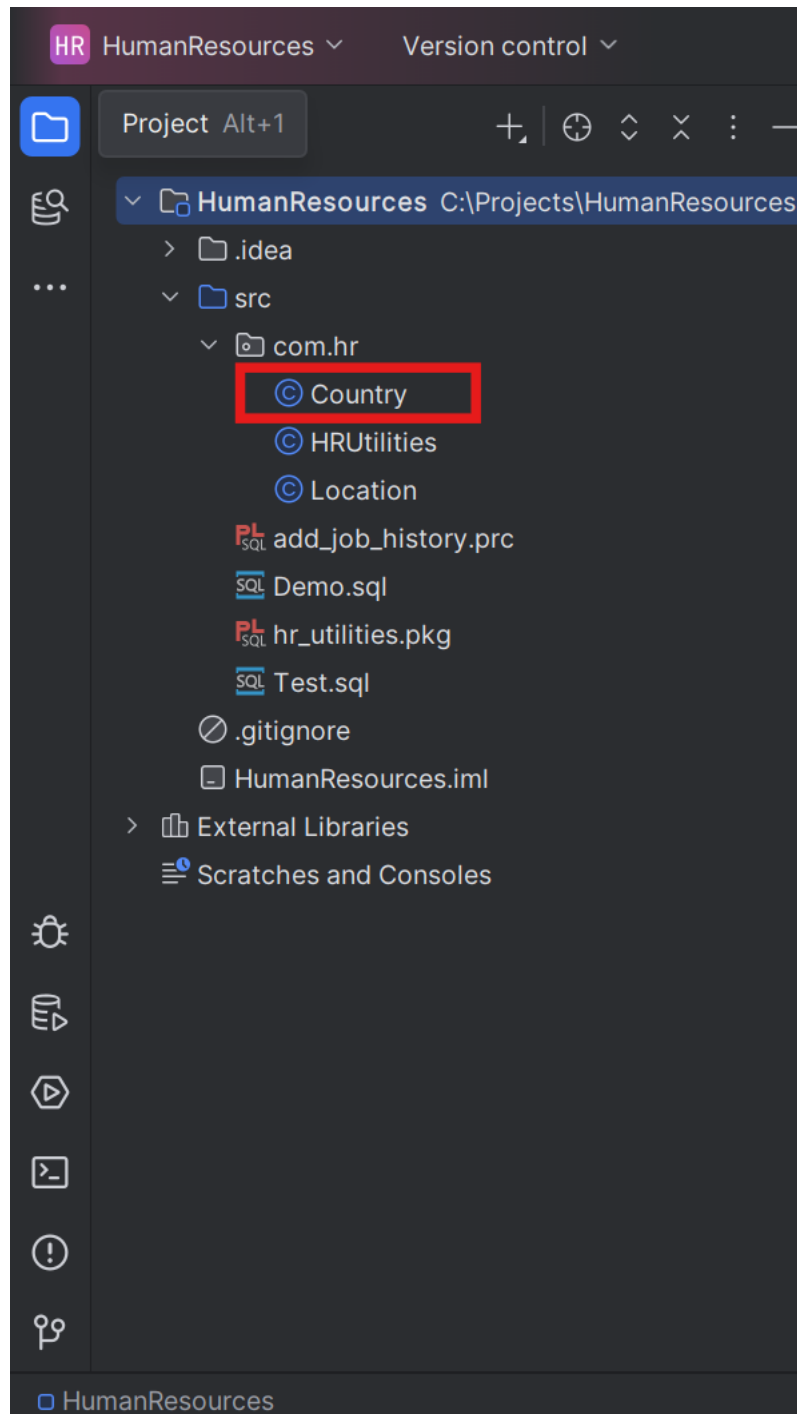
3. Select the **Target Module** (of the project) where the Java files will be compiled and deployed.
4. Select the Project root folder from the **Target Content Root** field.
5. Select the check boxes next to the files contained in the Java class that you want to download in the **Download content** section.
6. Click **Download**. Once the download process is successfully complete, the **DB Navigator - Java Download Process** window opens displaying the status.



7. Click **Show Results** to open the **DB Navigator - Java Download Result** dialog box that lists all the Java classes/resources that were created or updated in your project.



8. Double-click any of the listed files to open them in Java editor window or click **Open All/ Open Selected**.
9. Open the project folder in your IDE platform to verify the classes/resources are added to the specified project folder location.



Debugging Engine

This chapter provides an introduction to the debugging engine and its capabilities in Oracle® Database Navigator.

The Debugging Engine of Oracle® Database Navigator is a comprehensive diagnostic tool that enables you to execute the programs/methods in debug mode and identify errors or irregularity in the program behavior.

Topics:

- [Introduction to Debugging Engine](#)
This topic provides an overview of the debugging engine.
- [Debugger Engine Types](#)
This topic provides an overview of the debugger engines supported by the plug-in.
- [Debugging Methods](#)
This topic describes the procedure to debug PL/SQL methods in Oracle® Database Navigator.
- [Debugging Java Programs](#)
This topic describes the procedure to debug Java programs in Oracle® Database Navigator.
- [Debug Operations for PL/SQL and Java Programs](#)
This topic provides an overview of the operations that can be performed through the Debug console.

Introduction to Debugging Engine

This topic provides an overview of the debugging engine.

The Debugging Engine in the Database Navigator tool is a robust database code-diagnose solution, allowing controlled line-by-line program execution, introspection and alteration of runtime variables, setting breakpoints at various locations in the code, as well as a clear visualization of the execution flow. It helps pinpointing exact location of errors and easily identifying unwanted program behavior, offering a superior alternative to traditional debug logging. The debugging engine uses the Database Navigator's built-in execution engine to execute the method/program, while engaging a debugger agent to control the execution flow.

Debugger Engine Types

This topic provides an overview of the debugger engines supported by the plug-in.

The debugger tool comes with two different implementations (debug agents), aimed to support a variety of database infrastructure models, company network landscapes, and developer workspace setups.

- **JDWP (over TCP)** - JDWP (over TCP) is a debugger agent based on the Java Debug Wire Protocol (JDWP), requiring the database to have access to the developer workspace for

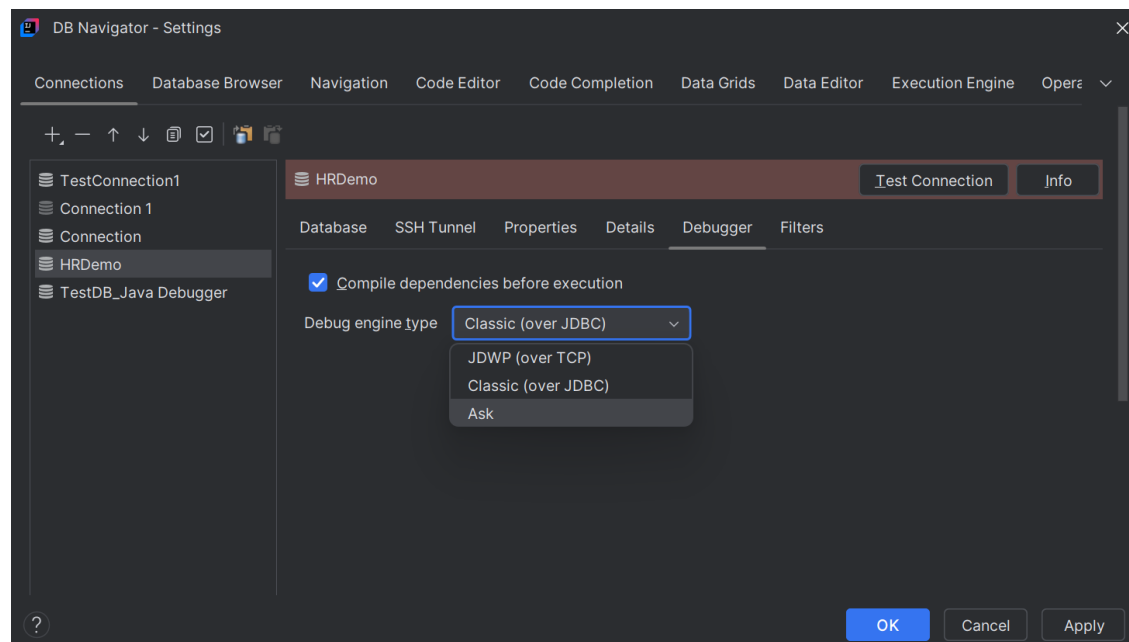
establishing a TCP connection. This option is not always available given the many layers of isolation the database may lay behind. The JDWP agent uses the Oracle® DBMS_DEBUG_JDWP (https://docs.oracle.com/en/database/oracle/oracle-database/19/arpls/DBMS_DEBUG_JDWP.html) package to control the program execution flow.

- **Classic (over JDBC)** - Classic (over JDBC) is the debugger agent that solely acts through the database driver, supporting a wider range of infrastructure models and developer landscapes. The JDBC agent uses the Oracle® DBMS_DEBUG package (https://docs.oracle.com/en/database/oracle/oracle-database/19/arpls/DBMS_DEBUG.html) to control the program execution flow and retrieve call-stack and variable information.
- [Debugger Engine Configuration for Database Connections](#)
This topic provides an overview of debugger configuration options available for connected databases.

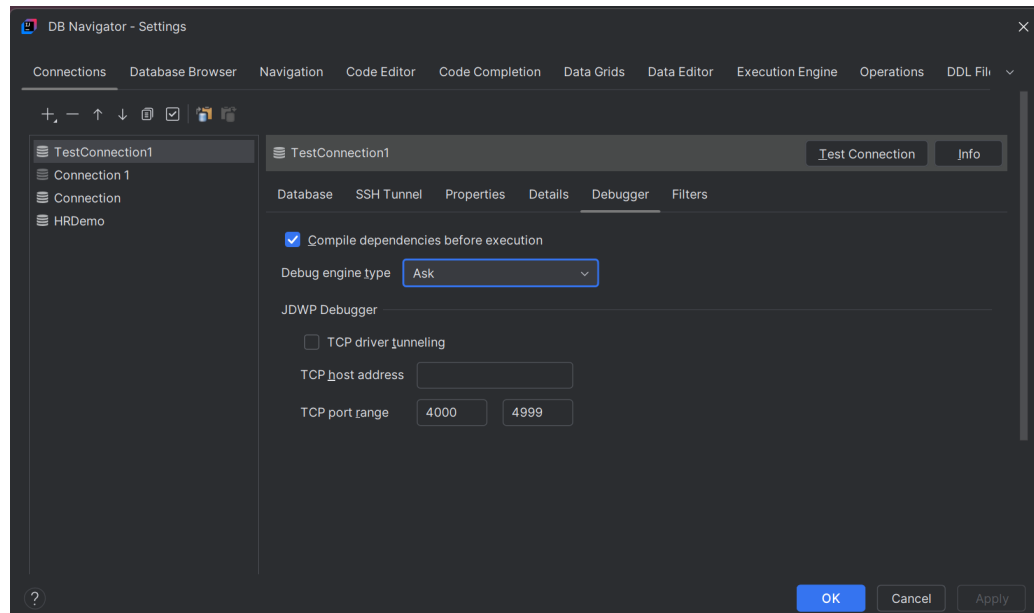
Debugger Engine Configuration for Database Connections

This topic provides an overview of debugger configuration options available for connected databases.

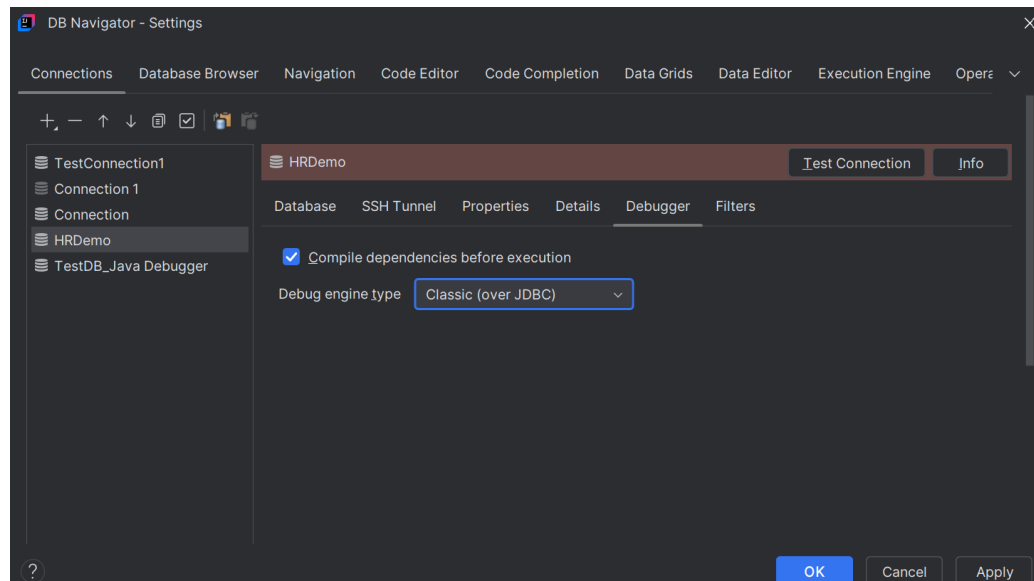
For a database connection, you can configure the general Debugger settings to debug PL/SQL and Java programs. To configure the Debugger settings for a database connection, from the Main menu of Oracle Database Navigator tool, select **DB Navigator > Settings > Connections** tab > **Debugger** tab for the specific database connection.



- Select the check box to enable compiling dependencies (such as libraries and object dependencies, backward, module and cyclic dependencies) before executing the Java program.
- Debug engine type:
 - **Ask** - Setting this option presents a confirmation dialog box every time you run the debugger for a program to select the debug engine that will be used for debugging. Options include Classic (over JDBC) and JDWP (over TCP).



- **Classic (over JDBC)** - configuring this option debugs the Java program utilizing Oracle's JDBC package in the background. This debug method can be used for cloud-based databases including Oracle Autonomous AI Database.

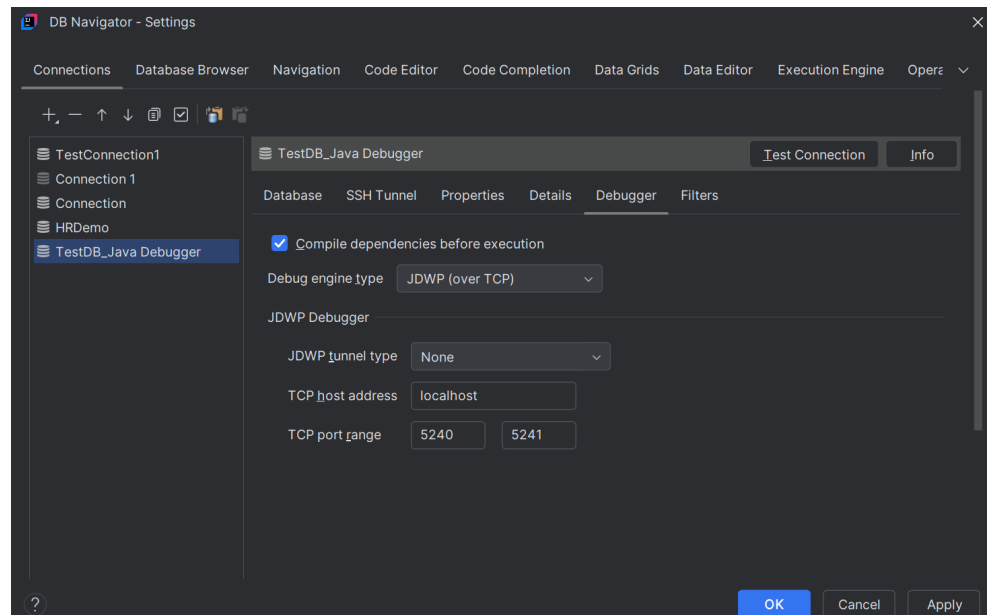


- **JDWP (over TCP)** - configuring this option debugs the Java program/Java stored procedure using the JDWP agent that connects to a Java Debugger (JDB) listener (setup in the IDE platform as JVM remote debugging). This debug method can be used for remote databases or OCI DB System.

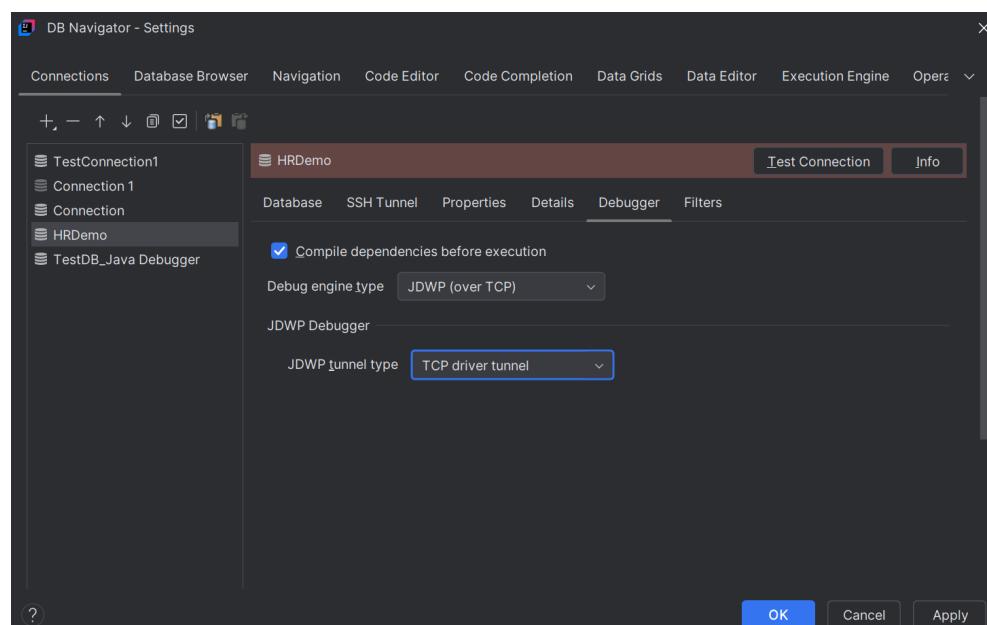
Note

The JDWP and JDBC engines use the Oracle SYS.DBMS_DEBUG_JDWP and SYS.DBMS_DEBUG packages to debug PL/SQL and Java code, respectively.

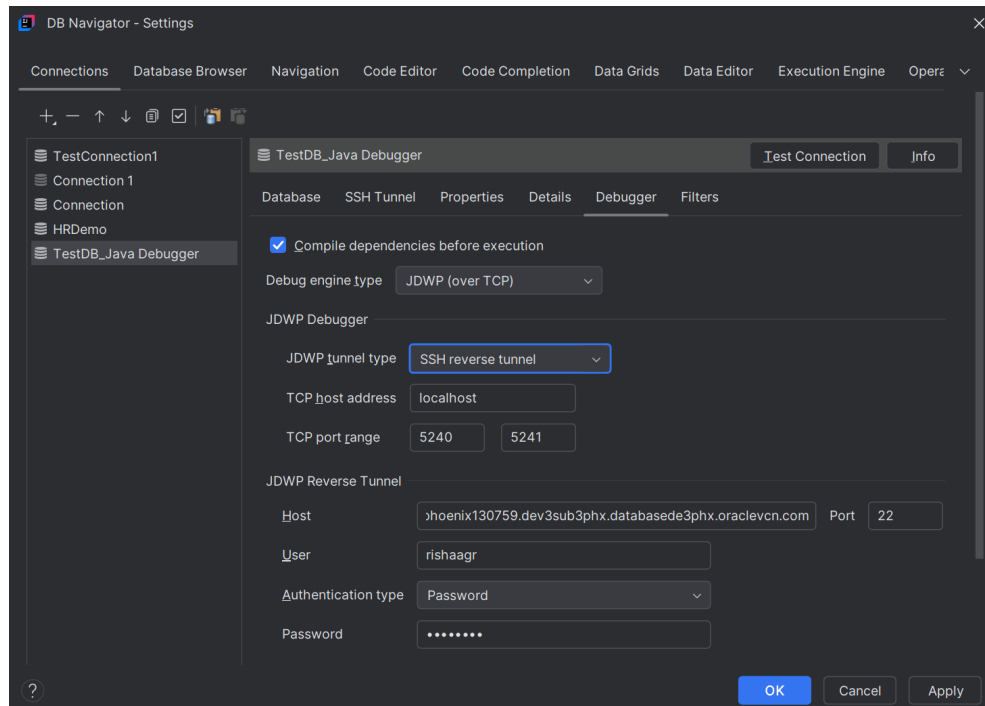
- If you configure JDWP Debugger as the default debug method, you further have to set up the following options:
 - **JDWP Tunnel Type** - Options include 'None', 'TCP Driver Tunnel' and 'SSH Reverse Tunnel'.
 - * Selecting **None** requires you to provide the standard TCP host/port requirement to establish a connection between the database and the Java Debugger (JDB) listener.



- * Selecting **TCP Driver Tunnel** enables TCP tunneling to access remote debugging session services offered by the IDE platform.



- * Selecting **SSH Reverse Tunnel** requires you to provide additional **Host** and **Port** details of the **JDWP Reverse Tunnel** along with the authentication information (username/password or config file with Open SSH key value pair).
An **SSH Reverse Tunnel** is used to project the JDB listener to a port on the database. By doing this, the database is able to connect to the JDB listener as if it were running locally, thus enabling debugging. This method is specifically useful to overcome the restrictive security policies of DB System (OCI Based DB Service) where the IDE is unable to open a JDB listener on any port of the DB System.



By default, OCI DB System allows reverse ssh-tunnel to open only on port 22. These restrictions can be removed by adding appropriate ingress/egress rules and additionally changing the security policy of the DB System.

Debugging Methods

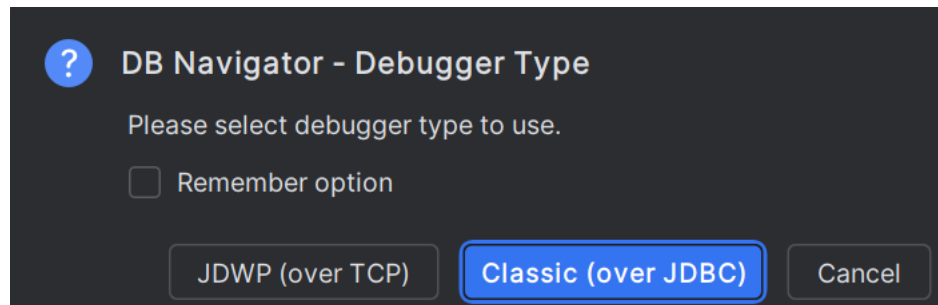
This topic describes the procedure to debug PL/SQL methods in Oracle® Database Navigator.

Debugging a PL/SQL program through Oracle® Database Navigator plug-in uses the execution engine and attaches the debugger agent to target process. If the run configuration in your IDE supports debugging and the method is compiled in debug mode, a green bug icon displays next to the object in the DB Browser window, indicating that you can run the program in debug mode.

Follow these steps to debug a PL/SQL method:

1. Right-click the method on the DB Browser window and select **Debug** from the context menu. Alternatively, double-click the method to open it in the editor window and then click the **Debug Method** icon from the editor toolbar menu.

A confirmation dialog box to select the debugger engine type to use pops up. This confirmation message only appears if the default debug engine type is not already configured to either JDBC or JDWP methods.

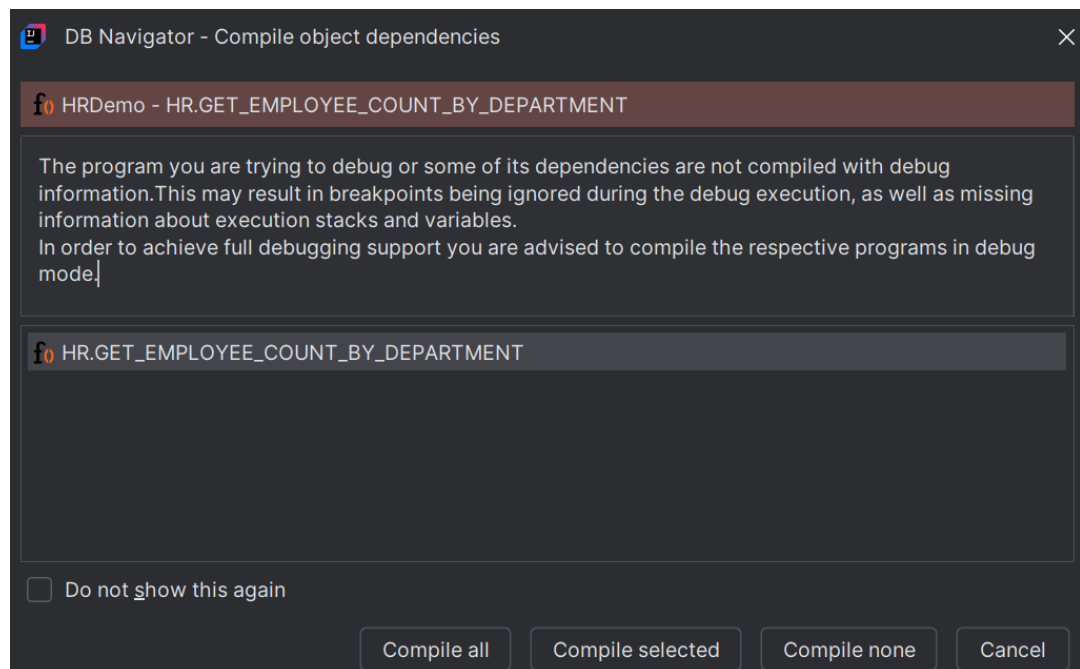


Note

You can choose to first compile the function or procedure by selecting **Compile > Compile Function/Compile Procedure** from the context menu of the method and then select **Debug**, or the **Compile Function (Debug)/Compile Procedure (Debug)** option.

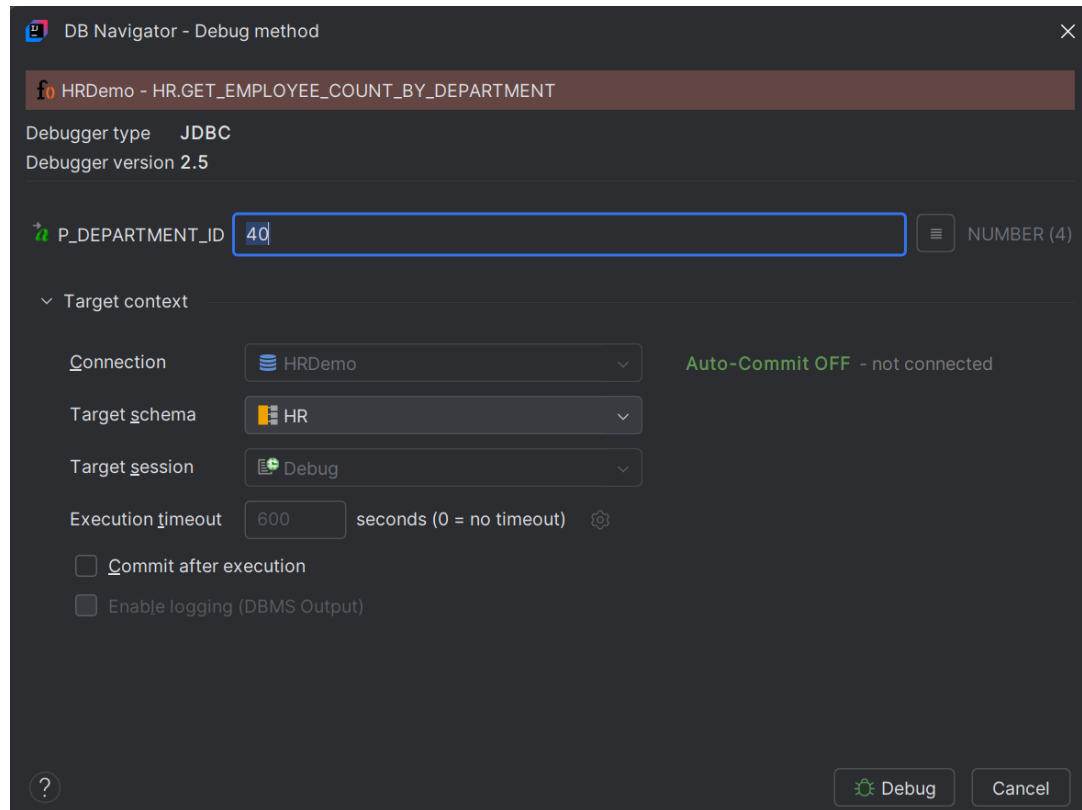
2. Select the **Debugger Type (JDWP over TCP or Classic over JDBC)** to initiate the debug session.

If the method or any of its dependencies are not compiled, the debug execution can result in inconsistencies. You will be prompted to first compile the program you are trying to debug.



3. Select **Compile all** or **Compile selected** to start compiling dependencies for program execution. The **DB Navigator - Debug Method** dialog box opens with the name of the

method being debugged and the selected **Debugger Type** and **Debugger version** specified.



4. Enter values in the input parameter text box(es). The permissible character type and max character length is mentioned next to the input parameter(s).

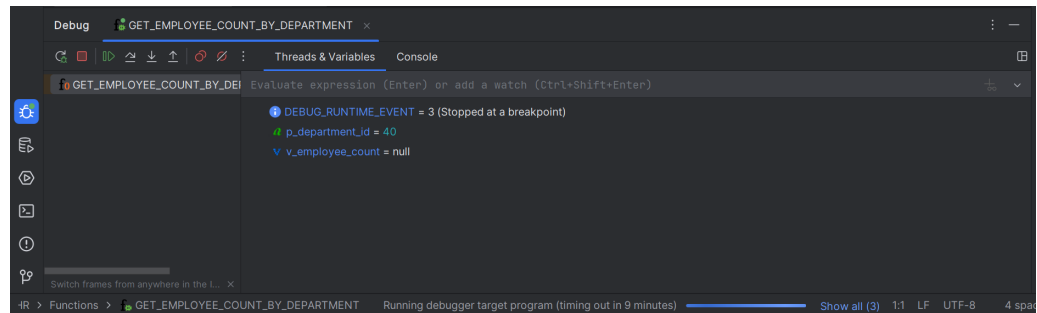
Clicking the **Possible Values** icon next to the text box displays the stored history for that parameter (previous input values used for executing the method) that you can select.

- In the **Target Context** section, the target database connection, schema and session information is provided. You can change the **Target Schema** to execute and debug the method.
- Set the **Execution timeout** duration in seconds, if you do not want the default time configured in the **Execution Engine settings**.
- Select the **Commit after execution** check box to auto-commit the execution transactions to the database.

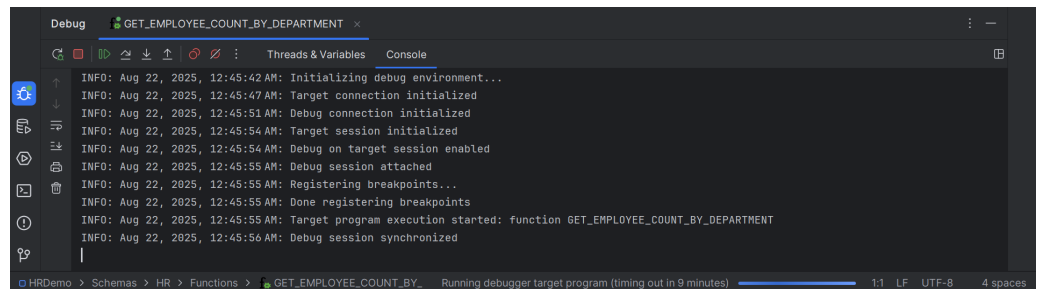
5. Click **Debug**.

The debugger session starts, and the processes are listed on the **Debug** console window. The **Debug** console displays the following tabs:

- **Threads & Variables** - displays the list of live threads (expressions) and variables along with the watches added to the variables. You can evaluate and switch between threads and also add a watch to analyze the program state.



- **Console** - displays the program output in addition to the debugger output (such as log messages from breakpoints)



Debugging Java Programs

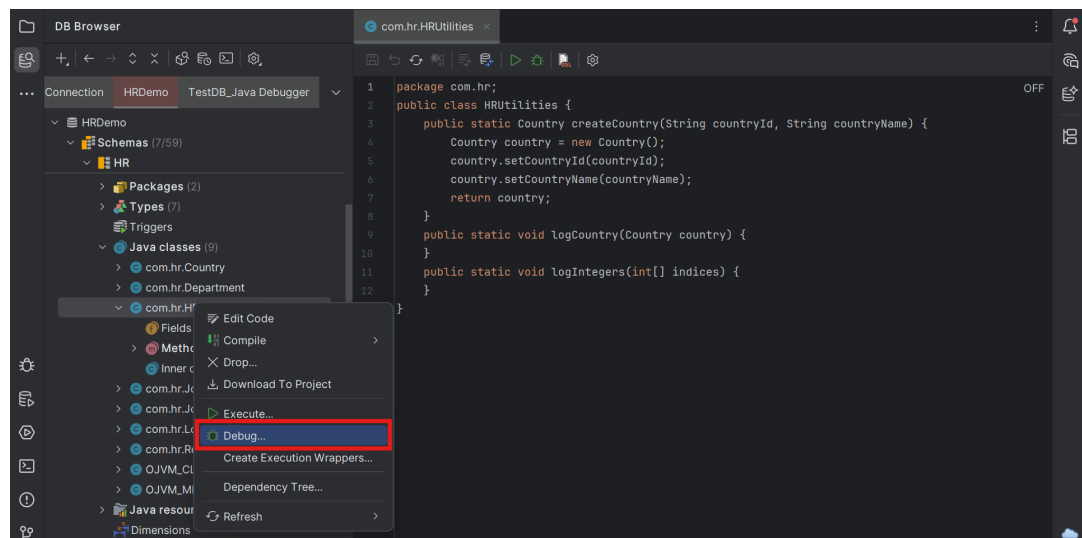
This topic describes the procedure to debug Java programs in Oracle® Database Navigator.

As part of OJVM support provided for Oracle Database Navigator plug-in, debugging a Java program running within Oracle databases involves setting up a Java debugger (JDB) listener and connecting to it using the Java Debug Wire Protocol (JDWP). Debugging a Java program through the DBN interface consolidates the following processes:

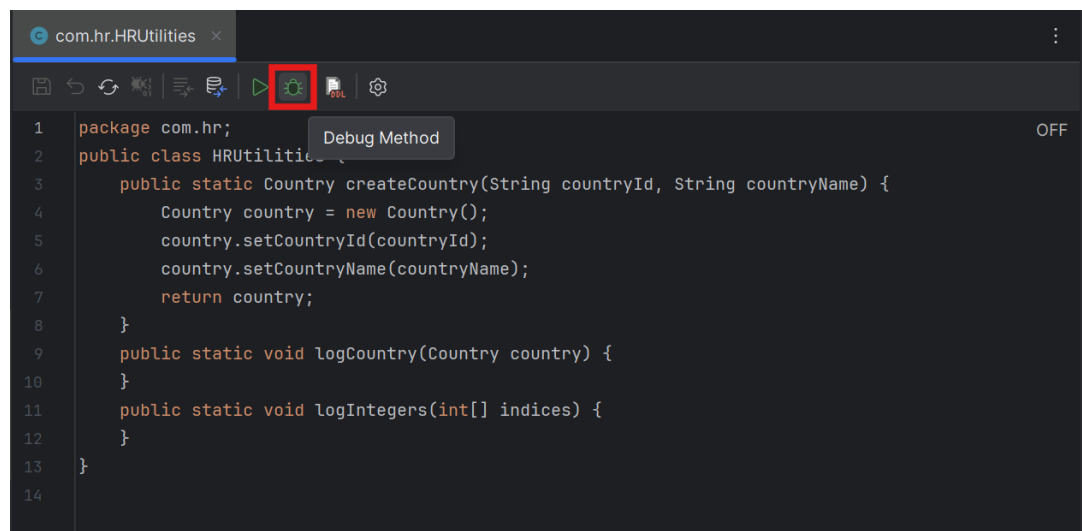
1. Opening a listener for "Remote JVM Debug" on the IDE platform.
2. Giving appropriate privileges to a database schema for:
 - debugging Java program
 - connecting to the Listener
3. Connecting to the Listener using Java Debug Wire Protocol (JDWP) from the database schema.
4. Executing the Java program.

Follow these steps to debug a Java program:

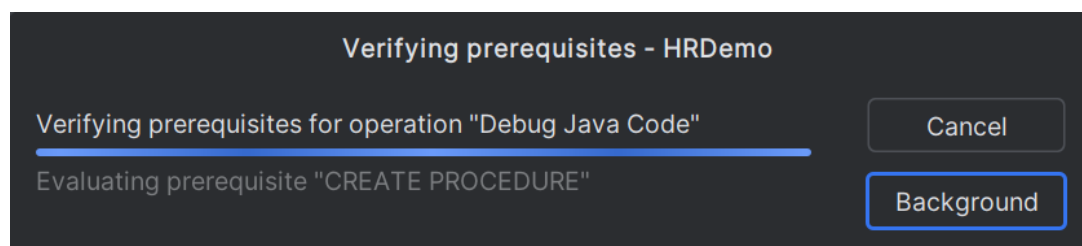
1. From the DB Browser window, expand the Java class (or Java source code) loaded in the database schema.
2. Right-click the Java class file or a method within the Java class and select **Debug** option from the context menu.



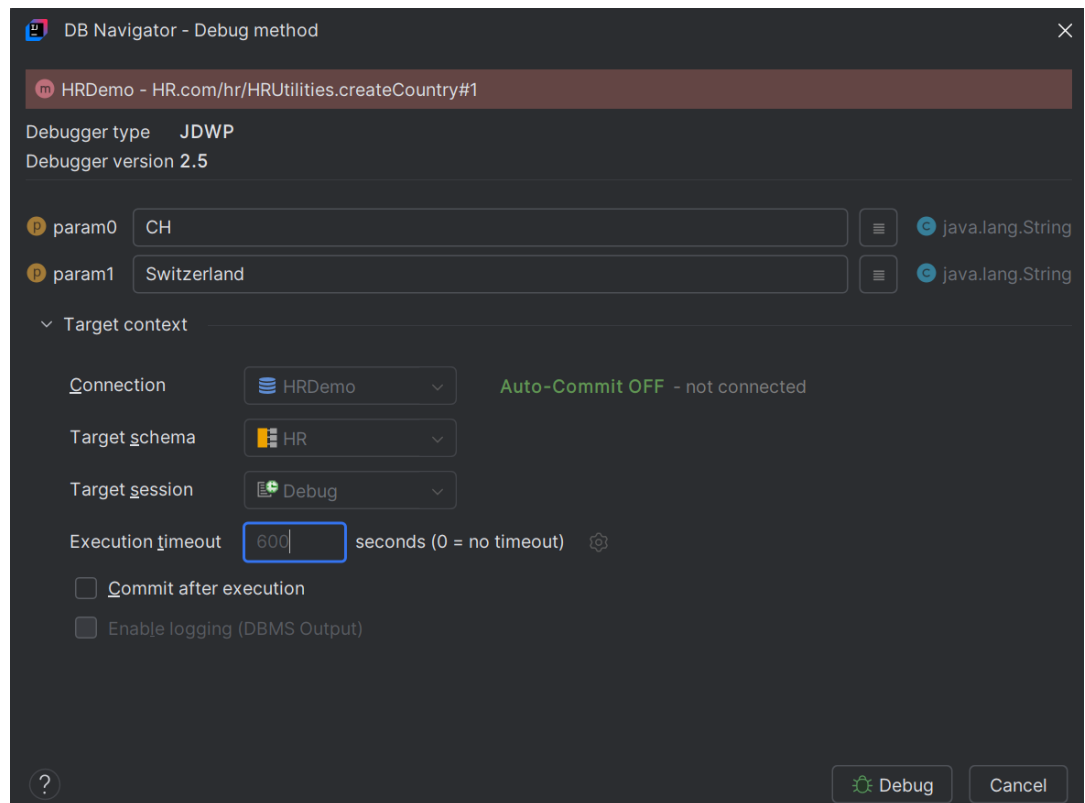
Alternatively, double click the Java class file to open it in the Java Editor window and from the editor toolbar menu, click the **Debug Method** icon.



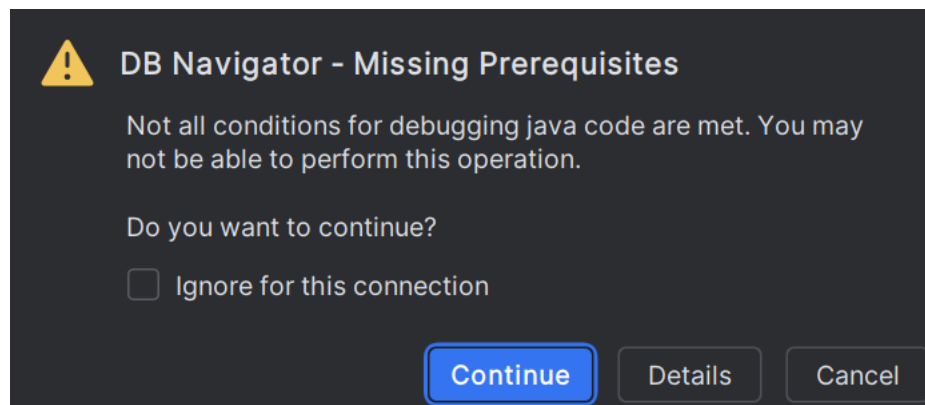
3. Select the public static method that you want to debug in that Java class file.
The system starts verifying the pre-requisites for performing the debug operation.



Once all the required permissions are successfully verified, the **DB Navigator - Debug Method** window opens displaying the **Debugger Type** being used and the **Debugger Version**.



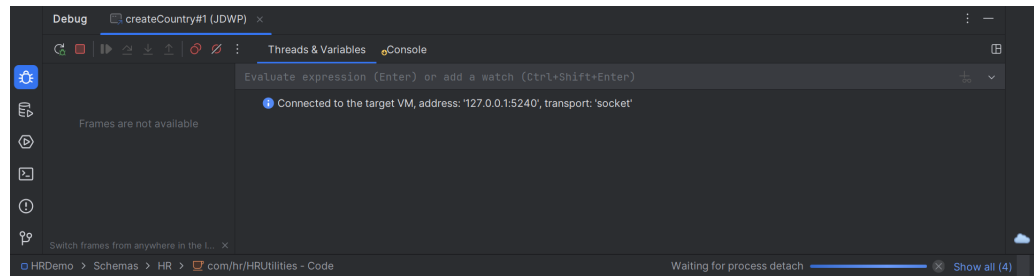
If you do not have all the pre-requisites met, the **DB Navigator - Missing Prerequisites** dialog box pops-up with a confirmation message to either continue by ignoring the required privileges for debugging the program or view the required privileges for that connection.



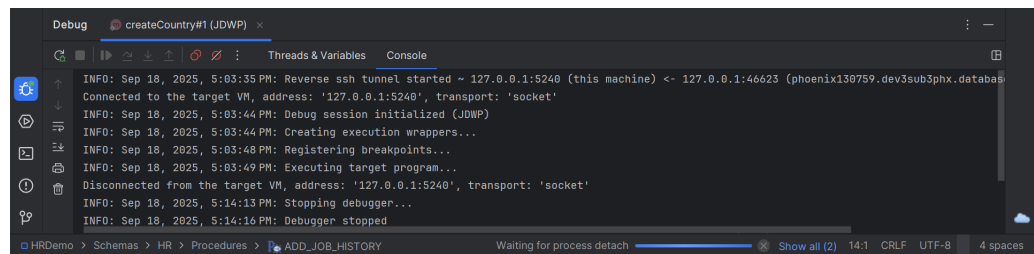
- Click **Details** on the dialog box to open the **DB Navigator - Prerequisites Verification** dialog box that lists all the required permissions for debugging the Java code. Contact your database administrator to provide you the required privileges.



- Click **Continue** to proceed with the debugging session without the required privileges.
4. In the **DB Navigator - Debug Method** window, enter the input parameter values in the text box(es). The defined data type for the input parameters are mentioned next to the text boxes. Clicking the **Open Value History** icon next to the text box displays the history of input parameter values previously used for executing/debugging the Java method for you to select.
 - In the **Target Context** section, the target database connection, schema and session information is provided. The **Target Session** by default is the "Debug" session.
 - Set the **Execution timeout** duration in seconds (duration for running the target Java program), if you do not want the default time configured in the **Execution Engine** settings. Click the **Settings** icon to set the custom execution timeout duration as the configured time for all debug sessions.
 - Select the **Commit after execution** check box to auto-commit the execution transactions to the database.
 5. Click **Debug**. The debug session starts, and the processes are listed on the **Debug Console** window. The **Debug Console** displays the following tabs:
 - **Threads & Variables** - displays the list of live threads (expressions) and variables along with the watches added to the variables. You can evaluate and switch between threads and also add a watch to analyze the state of the program.



- **Console** - displays the program output in addition to the debugger output and the debugger session status messages.



Debug Operations for PL/SQL and Java Programs

This topic provides an overview of the operations that can be performed through the Debug console.

The Debug window toolbar enables you to perform the various actions on an ongoing debug session. You can evaluate each expression/line of code where the breakpoint pauses the execution of the PL/SQL method or the Java program. You can also add and manage multiple watches on the expression variables. The following table lists some of the common debugging operations:

Toolbar Options	Description
Rerun	Restarts the debugger session.
Pause	Pauses the debugger session when running.
Resume Program	Resumes the debugger session when paused.
Step Over	Steps over the current line of code and move to the next executable line, skipping any method implementation lines.
Step Into	Steps into the method to evaluate it.
Step Out	Steps out of the current method or code block and jumps to the caller method.
View Breakpoints	Opens the Breakpoint dialog box to create, manage and remove breakpoints.
Mute Breakpoints	Mutes the breakpoints so that execution does not stop at the breakpoints while the debugger session continues to run.
Up the Stack Trace	Moves from the bottom of the list to examine the program call stack being debugged.
Down the Stack Trace	Moves from the top of the list to examine the program call stack being debugged.

Toolbar Options	Description
Soft-Wrap	Wraps long lines of program code in the debug console output window, preventing horizontal scrolling.
Scroll to End	Scrolls to the end of the debug console window to navigate to the latest output.
Force Step Over	Forces the debugger to skip over the current line of code and move to the next while ignoring the breakpoints within the called method.
Force Step Into	Forces the debugger to step into the method you are interested in, even if that method is skipped by the regular 'Step Into' action.
Smart Step Into	If there are several methods called in a line, select the specific method and then select this menu option to step into that method in the code.
Run to Cursor	Continues execution of the target program until the position of the caret is reached.
Force Run to Cursor	Forces the execution to reach until the position of the caret, ignoring the breakpoints on the way.
Show Execution Point	Jumps to the current execution point in the line of code where the program execution is paused.
Get Thread Dump	Captures a snapshot of the current state of the debugged program, including call stacks for all active threads.
Trace Current Stream Chain	Provides a visual step-by-step analysis of how data flows and transforms through a stream pipeline, when debugger is paused within a stream operation.
Debugger Settings	Allows you to: • Open files in preview tab • Show variable values in editor • Unmute breakpoints on session finish
Modify Run Configurations	Opens the Run/Debug Configurations window of your IDE platform where you can create new configurations (temporary or permanent) or make changes to the existing ones for an executable class or method.

12

Database Assistant

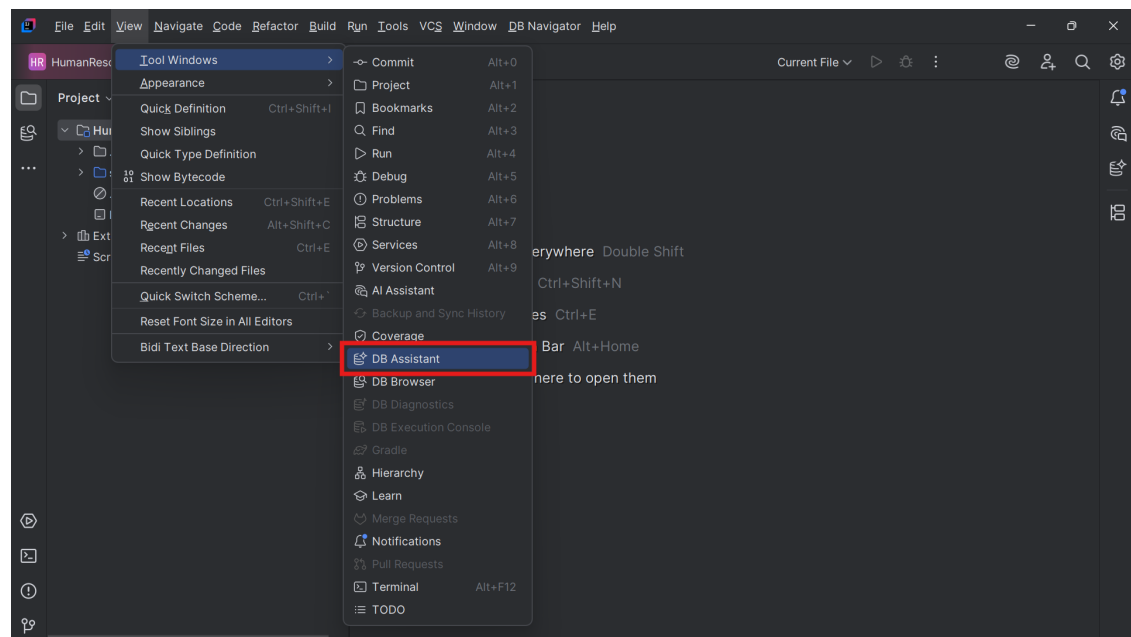
This chapter provides an introduction to the AI assistance capabilities of Oracle® Database Navigator.

The DB Assistant module of Oracle Database Navigator plug-in comes integrated with the proficiencies of Oracle Select AI and other widely used large language models. The DB Assistant provides wide-range SQL translation and generation capabilities so you can generate and execute SQL queries specific to your organization's data.

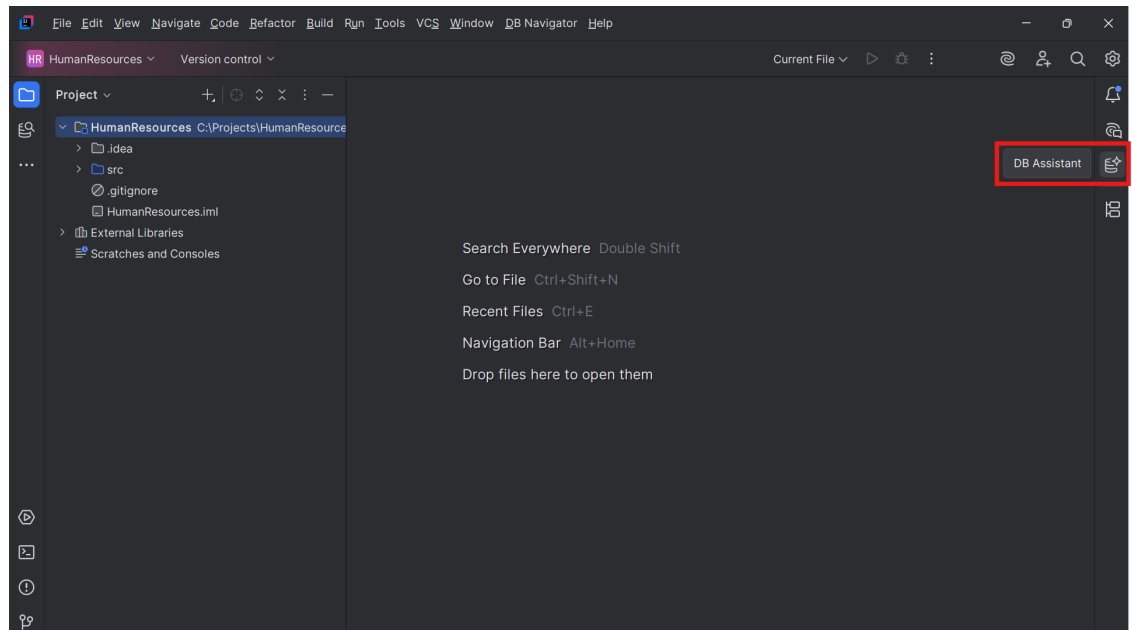
Using the built-in 'natural language question-to-SQL query' capability of Select AI and other broad range of LLMs, it enables you to have a contextual interaction with your data sets intuitively and obtain instantaneous insights without the need of writing SQL queries.

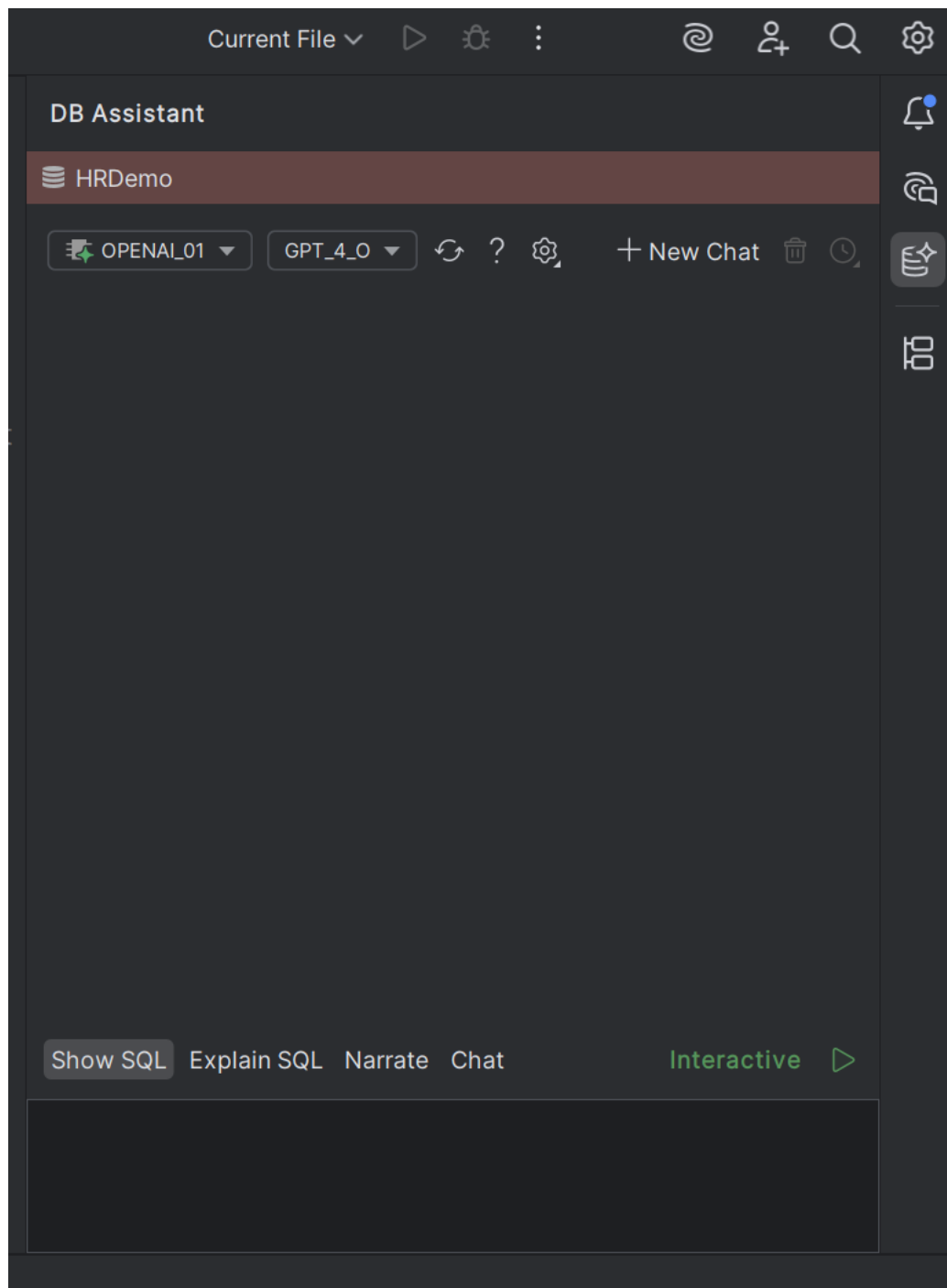
The DB Assistant module provides you the option of setting up AI profiles that makes use of a language model of your choice (such as OpenAI, Cohere, Anthropic or Google Gemini) to interact with the enterprise data in your own language over dedicated chat threads and garner responses.

To access the DB Assistant window, from the Main menu of the Oracle® Database Navigator toolbar, select **View > Tool Windows > DB Assistant**.



If the DB Assistant icon is displayed on the sidebar of the IDE tool, clicking the icon also opens the DB Assistant window.





You can start interacting with the DB Assistant using the chat box provided in the window.

Topics:

- [Oracle Select AI](#)
This topic provides overview of integration of Oracle Select AI with DB Assistant.
- [Public LLMs](#)
This topic provides an overview of the public LLMs supported in the DB Assistant module.

Oracle Select AI

This topic provides overview of integration of Oracle Select AI with DB Assistant.

Oracle Select AI in DB Assistant enables you to connect to an LLM through the database, while exposing the database information to the LLM through profiles. The profiles and user credentials to access those profiles (corresponding to LLMs) to use with Select AI are stored in the database.

Integrated with Oracle Select AI features, the **DB Assistant** module of Oracle® Database Navigator allows you to:

- interact with your database connection and data model securely using natural language inputs
- get insights of your code and data in a conversational manner through dedicated chats
- create AI profiles corresponding to the language models and create user credentials to access those AI profiles
- choose an AI provider and the language model (and version) to work with and configure the LLM settings
- select the language model and version and configure the LLM settings
- map specific data sets of a DB connection to the AI profiles and generate responses catering those data sets
- generate prompt-based SQL statements and their detailed explanation including the output inference in natural language
- get responses to inputs based on previous prompts without specifying the context for each prompt (Interactive mode chat)
- perform Select AI-based context actions directly on the data editor (or console)

For more information, see [Oracle Select AI](#) documentation.

To work with Oracle Select AI, first open the DB Assistant window and select the database connection from the window banner. You then have to select an **AI Profile** and a **Language Model** from the respective drop-down fields of the DB Assistant window. This ensures the responses are generated in the context of the database connection which you have selected and the datasets which are mapped to the Profile.

- [Creating Credentials for Oracle Select AI](#)
This topic describes the procedure to create credentials to work with Oracle Select AI profiles.
- [Creating AI Profiles for Oracle Select AI](#)
This topic describes the procedure to create AI Profiles to work with Oracle Select AI.
- [Working with Select AI](#)
This topic provides an overview of interaction with DB Assistant module using Select AI.

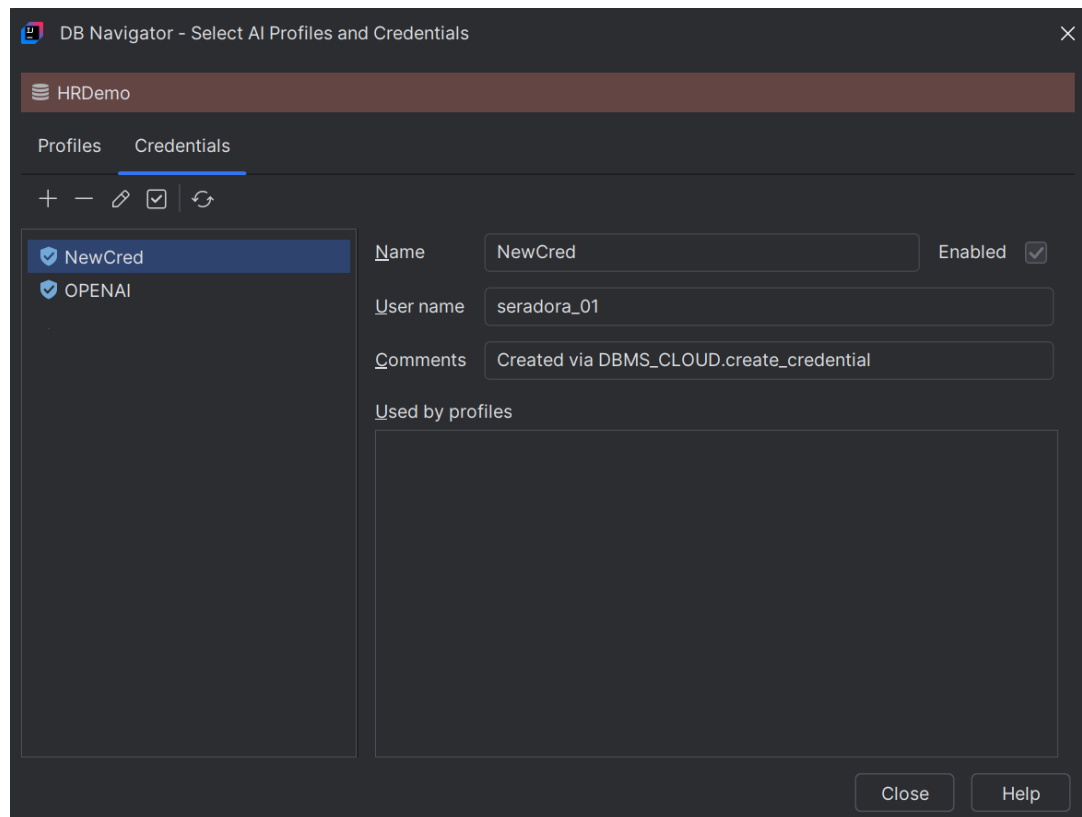
Creating Credentials for Oracle Select AI

This topic describes the procedure to create credentials to work with Oracle Select AI profiles.

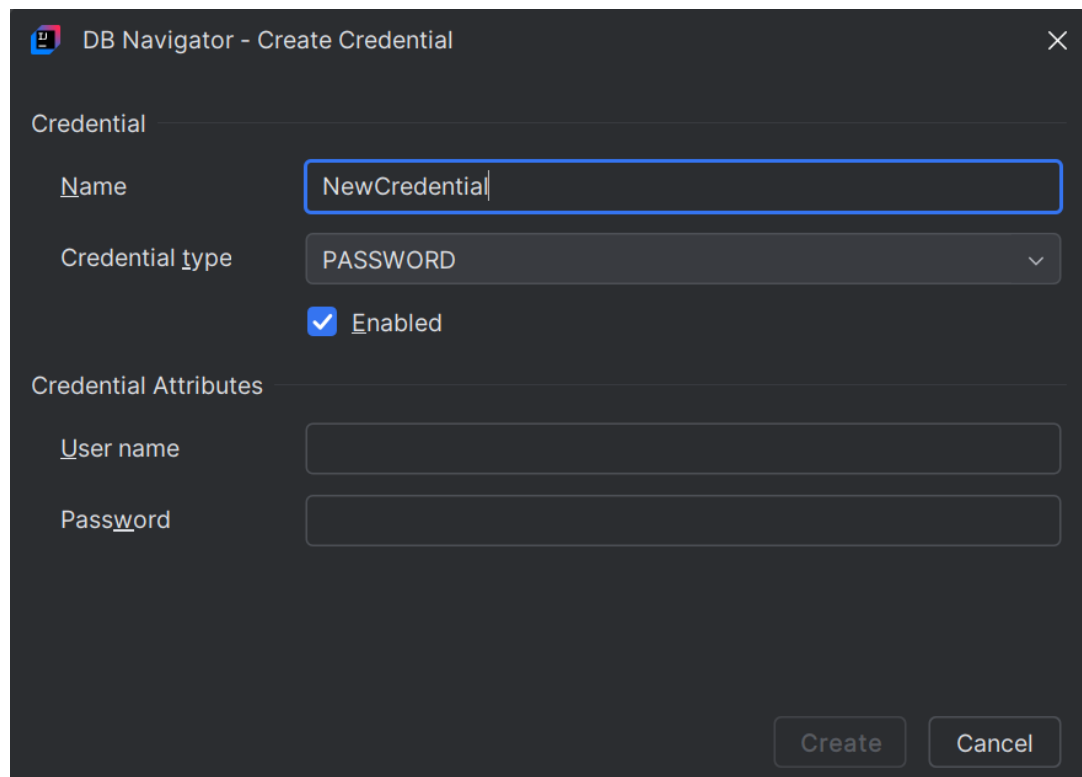
You can create user credentials that are used to access language models corresponding to an LLM provider. When used along with an AI profile, the credential allows you to use the LLMs, which in turn receive access to your connected databases.

Follow these steps to create a new credential for Select AI:

1. From the DB Assistant window, click the **Profile Setup** (gear) icon to open the **DB Navigator - Select AI Profiles and Credentials** window.



2. In the **Credentials** tab, click the **Create Credential (+)** icon to open the **DB Navigator - Create Credential** dialog box.



DB Navigator - Create Credential

Credential

Name: NewCredential

Credential type: PASSWORD

☒ **Enabled**

Credential Attributes

User name:

Password:

Create Cancel

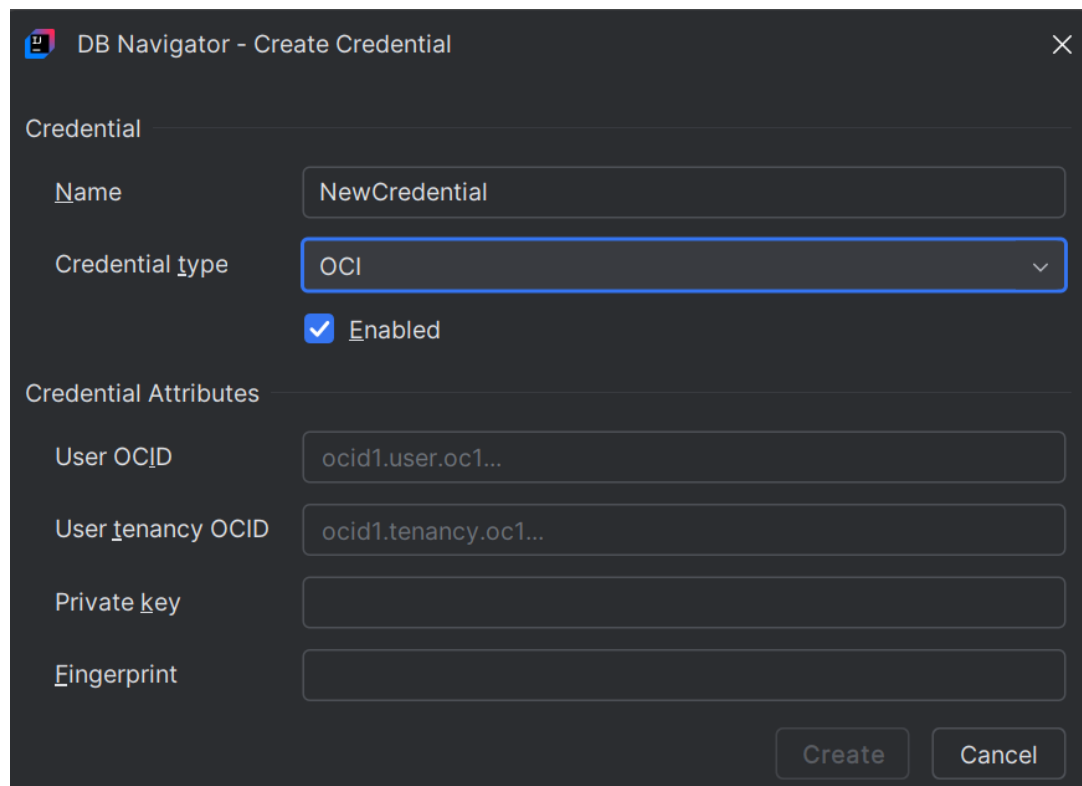
3. Provide the following details in the **DB Navigator - Create Credentials** dialog box:

- **Name** - Provide a name to identify the credential.
- **Credential Type** - Select from **Password** or **OCI** type user credential.
- **Enabled** - Select this check box to indicate whether the credential is enabled or disabled for use.

If you select **Password** credential type, enter the **Username** and **Password** to use the credential.

If you select **OCI** credential type, provide the following OCI attributes:

- **User OCID** - Enter the unique OCID of the user.
- **User Tenancy OCID** - Enter the unique OCID of the connection tenancy.
- **Private Key** - Select the downloaded Private key file saved in your `.oci` directory.
- **Fingerprint** - Provide the fingerprint of the Private key that you added.



4. Click **Create**.

The new credential created appears as **Credentials** options when you create or edit a **Profile**. The credentials for Select AI are stored in the respective database and are used along with Profiles to interact with LLMs in DB Assistant.

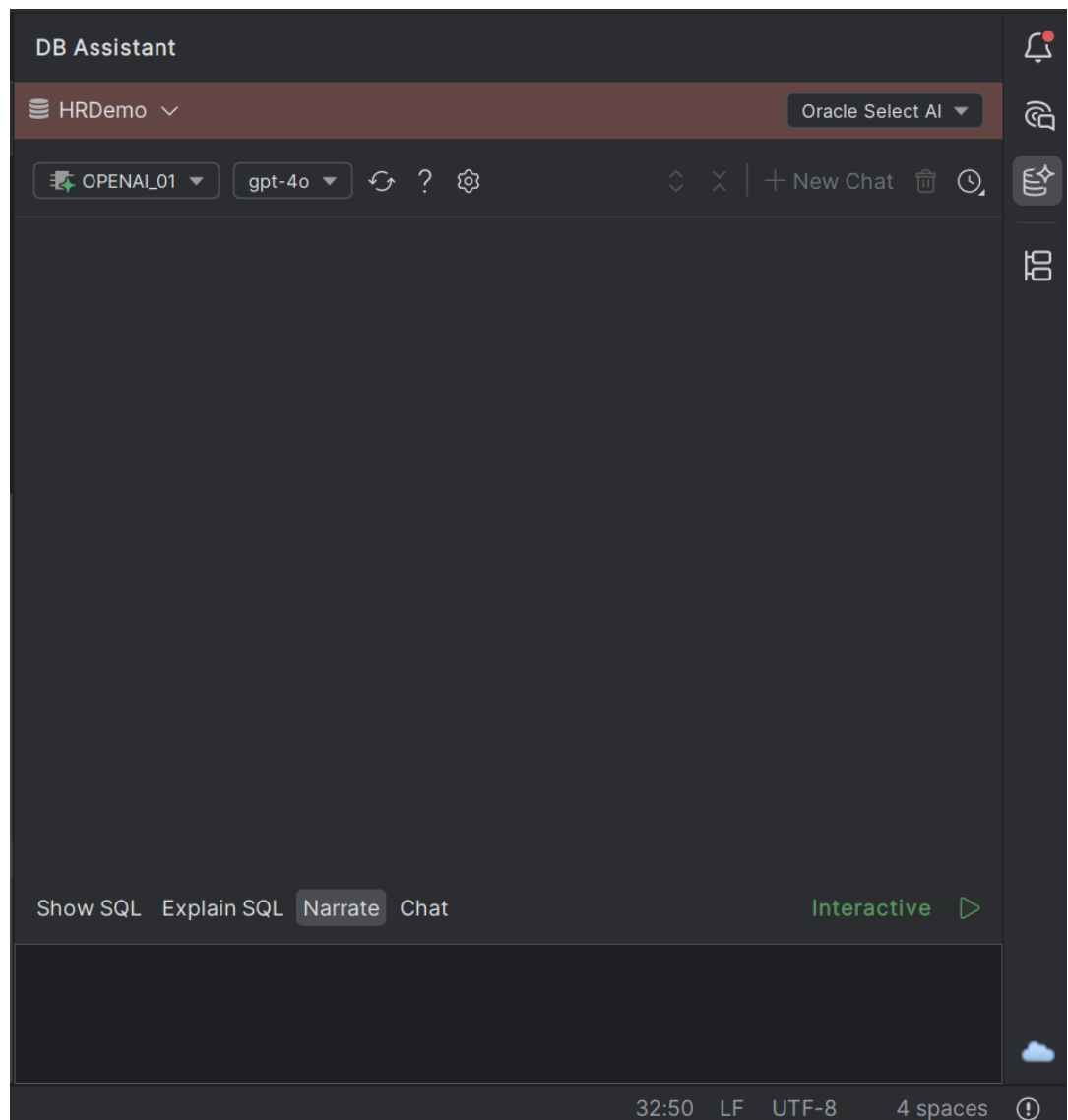
Creating AI Profiles for Oracle Select AI

This topic describes the procedure to create AI Profiles to work with Oracle Select AI.

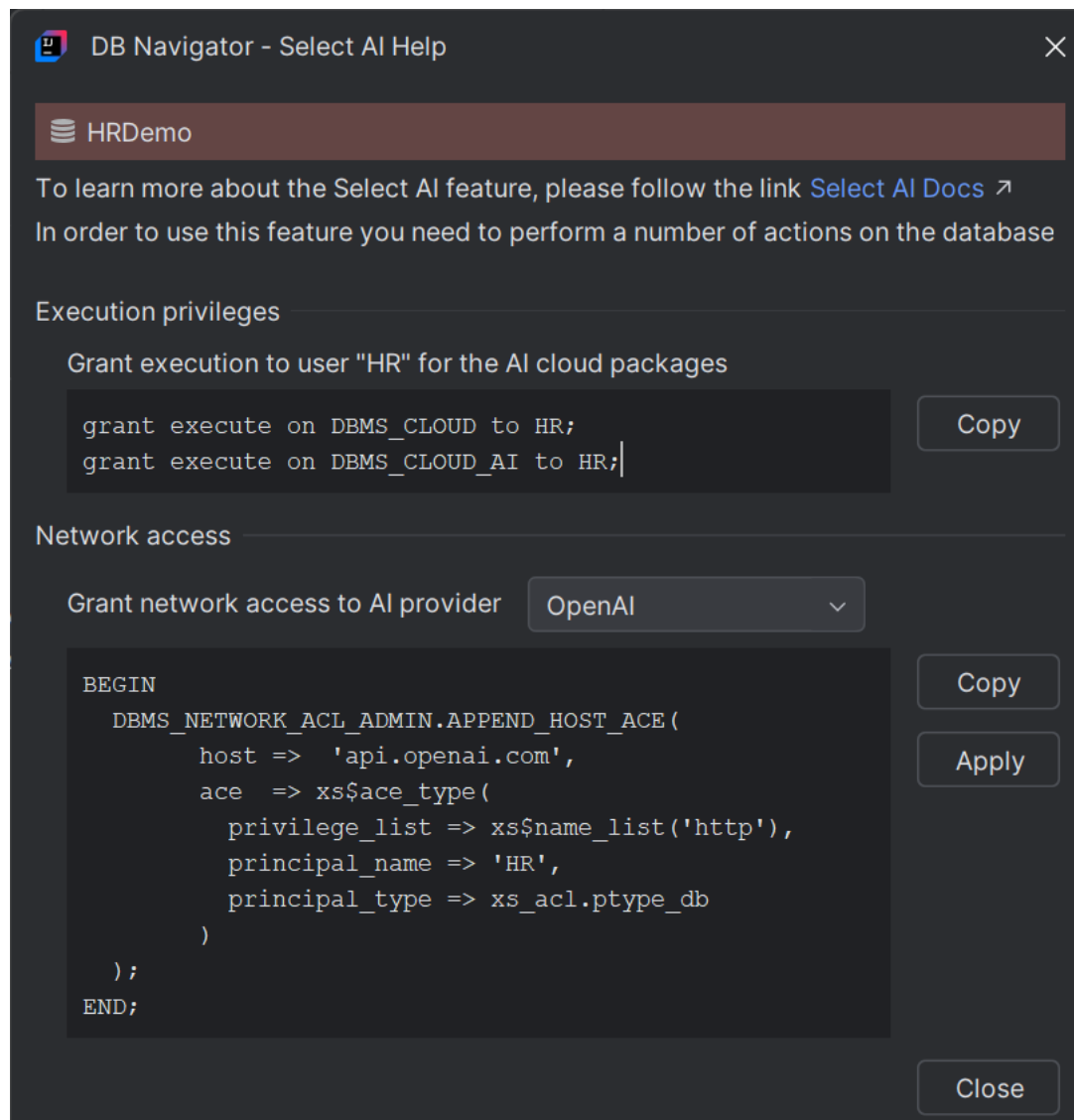
AI Profiles enables you to use a Language Model to interact with your database and generate responses catering to that data. In order to utilize Oracle Select AI features of DB Assistant, the user credential should have execution privileges for the AI cloud packages, while the chosen AI provider should have necessary network access.

Follow these steps to create a new AI Profile when working with Oracle Select AI:

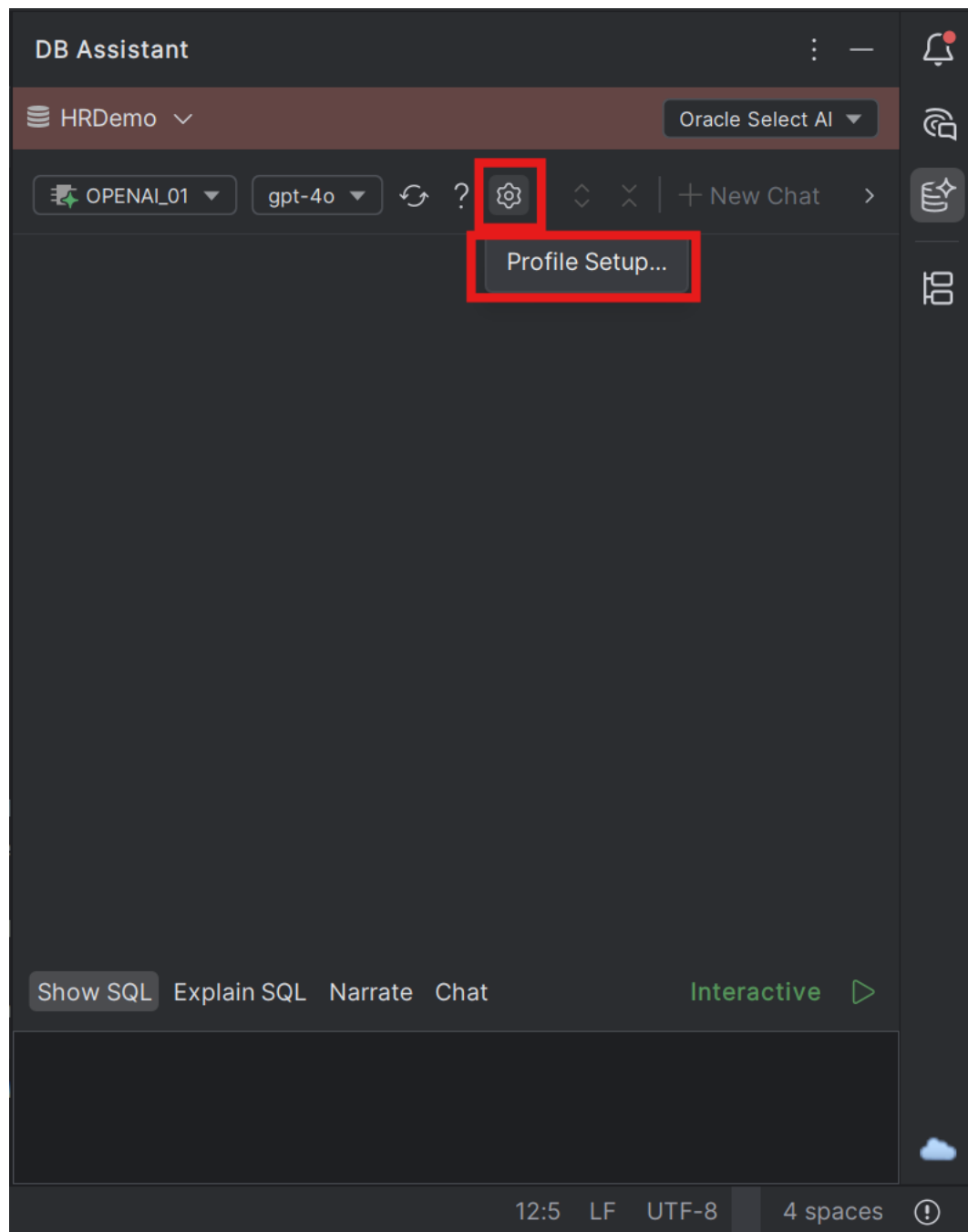
1. Click the **DB Assistant** icon on your IDE platform to open the DB Assistant window.



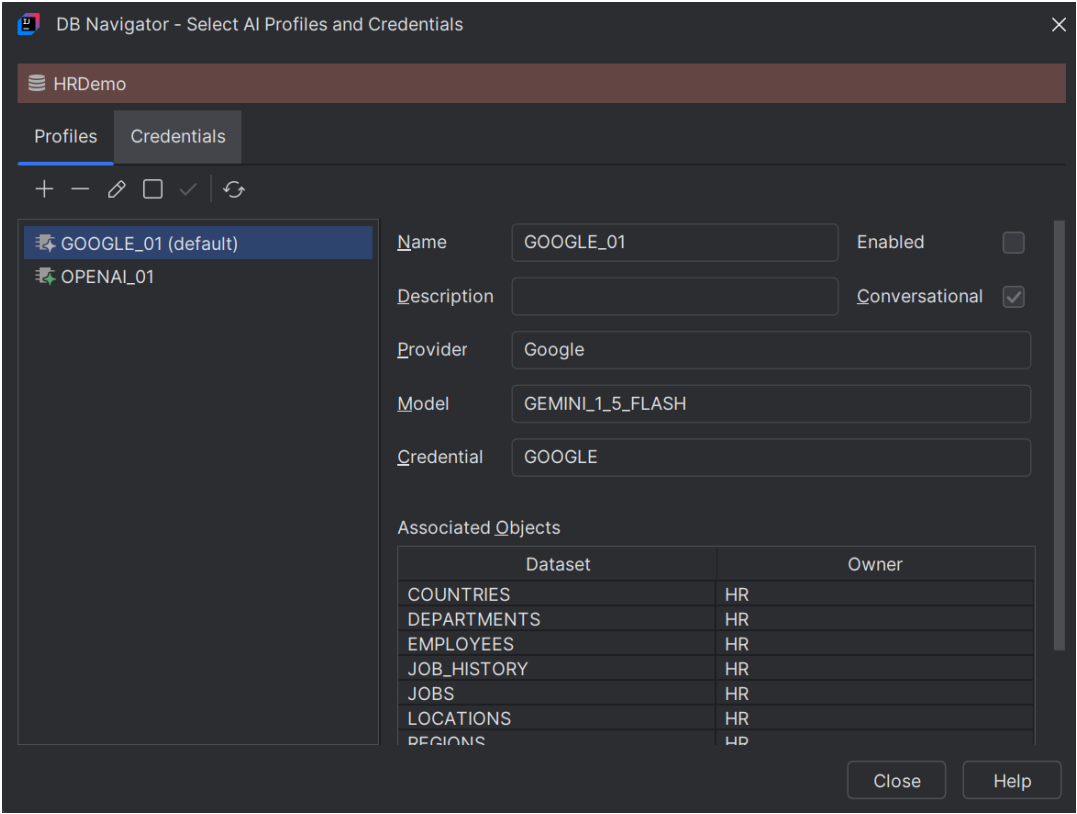
2. From the DB Assistant window banner drop-down, select **Oracle Select AI**.
3. Click the **Help (?)** icon on the DB Assistant window toolbar. The **DB Navigator - Select AI Help** dialog box opens.



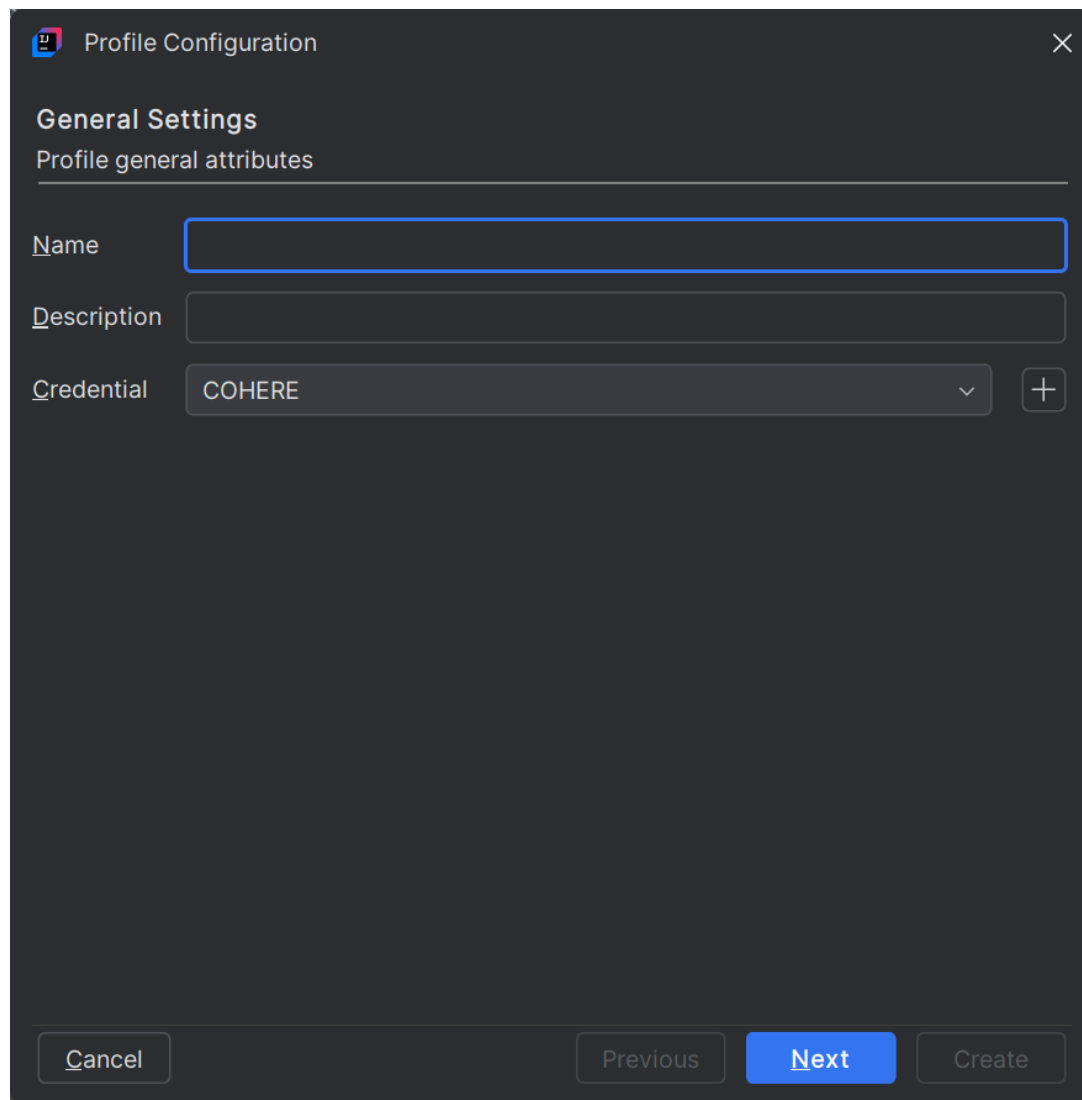
4. Perform the actions for the connected database as instructed in the Help window and then **Close** it.
5. Next, from the DB Assistant window, click the **Profile Setup** (gear) icon.



The **DB Navigator - Select AI Profiles and Credentials** dialog box opens.



6. On the **Profiles** tab, click the **Create Profile (+)** icon. The **Profile Configuration - General Settings** dialog box is displayed.



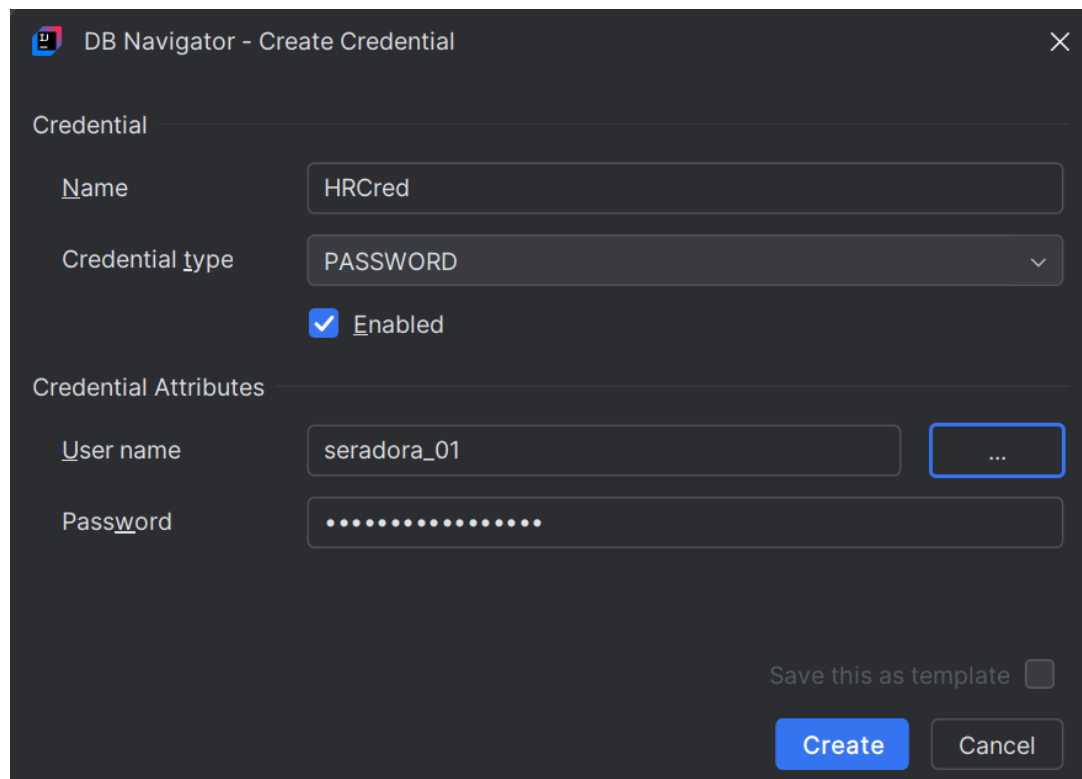
The screenshot shows a 'Profile Configuration' dialog box with a dark theme. The title bar includes a close button (X) and the text 'Profile Configuration'. Below the title bar is a section titled 'General Settings' with the subtitle 'Profile general attributes'. There are three input fields: 'Name' (a text box with a blue border), 'Description' (a text box), and 'Credential' (a dropdown menu showing 'COHERE' with a plus icon to its right). At the bottom of the dialog are four buttons: 'Cancel', 'Previous', 'Next' (highlighted in blue), and 'Create'.

7. Enter the following **General Settings** information:

- **Name** - AI profile name
- **Description** - Short description for the profile
- **Credential** - Select one from the drop-down list of existing AI profile credentials. You can also create a new credential for the AI profile by clicking the **Create Credential (+)** icon next to the **Credential** drop-down list.

Note

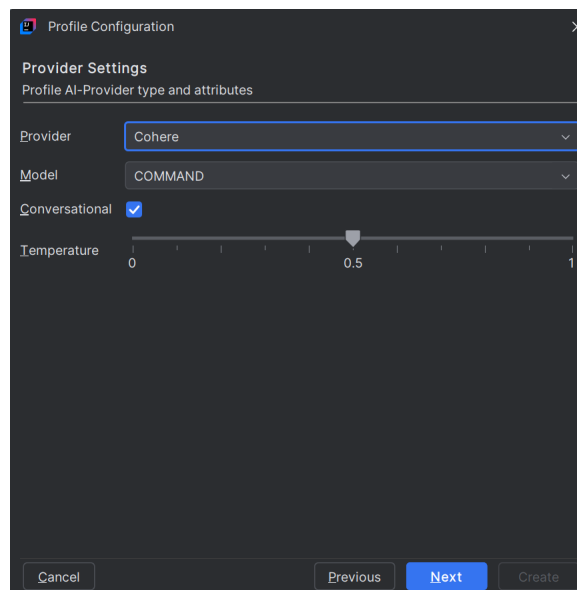
To create a new user credential, in the **Create Credential** dialog box enter the credential information such as the **Name** and **Credential Type**, and based on the type, the **Password** (Secret) or other **Credential Attributes** including **User OCID**, **User Tenancy OCID**, **Private Key** and **Fingerprint**. Once you click **Create**, the credential gets listed on the **Credential** drop-down list to select for the AI Profile.



The image shows the 'DB Navigator - Create Credential' dialog box. It has a dark theme. The 'Credential' section contains a 'Name' field with 'HRCred', a 'Credential type' dropdown set to 'PASSWORD', and an 'Enabled' checkbox that is checked. The 'Credential Attributes' section has a 'User name' field with 'seradora_01' and a password field with masked characters. There is a 'Save this as template' checkbox and 'Create' and 'Cancel' buttons at the bottom right.

8. On the **Profile Configuration** dialog box, click **Next**.

The **Profile Configuration** - Provider Settings dialog box is displayed.



The image shows the 'Profile Configuration - Provider Settings' dialog box. It has a dark theme. The 'Provider Settings' section includes a 'Provider' dropdown set to 'Cohere', a 'Model' dropdown set to 'COMMAND', a 'Conversational' checkbox that is checked, and a 'Temperature' slider set to 0.5. At the bottom, there are 'Cancel', 'Previous', 'Next', and 'Create' buttons.

9. Enter the following **Provider Settings** information:

- **Provider** - From the drop-down list, select the AI provider for the profile. Following LLM providers are available:
 - OCI Generative AI
 - Open AI

- Cohere
 - Google
 - Anthropic
 - Hugging Face
- **Model** - From the drop-down list, select the LLM corresponding to the AI provider.
 - Select the **Conversational** check box to indicate that the "Interactive" mode is enabled for the profile. Interacting through a profile in conversational mode allows follow-up prompts by remembering the context of the previous prompt(s) and provide responses without the need of explicitly adding the context each time. For example, if you type "How many tables are there in HR schema?" followed by "what about the Views?" in the chat box, the second prompt will still fetch the Views from the HR schema without mentioning that detail.
Not selecting the check box indicates that the profile is in "Non-Interactive" mode. Every prompt you enter is considered as an isolated query independent from the context of previous prompts.
 - Set the **Temperature** for the LLM using the slider to control the 'randomness' of the output response. Lower temperature yields more predictable results that are more precise, while higher temperature yields less predictable results that are more elaborate.
10. Click **Next**.

The **Profile Configuration** - Profile Object Settings dialog box is displayed.

Profile Configuration

Profile Object Settings

Database objects that will be exposed by this profile

AI-Profiles must include information about your data model to be forwarded to the language model. This will allow it to produce more accurate results, closely tailored to your data model. The metadata can include database table names, column names, column data types, and comments. Your data will never be sent out to the language model.

Please find the datasets you want to include in the profile, and drag them to the container on the right. Start by selecting the schema.

HR

Filter

☒ Tables ☐ Views ☐ Materialized views

Available Datasets

- CREATE\$JAVA\$LOB\$TABLE
- GOOGLE_01_FEEDBACK_VECINDEX\$
- JAVA\$OPTIONS
- JOBS
- NOTIFICATIONS

Profile Datasets

- HR.COUNTRIES
- HR.DEPARTMENTS
- HR.EMPLOYEES
- HR.JOB_HISTORY
- HR.LOCATIONS

Cancel Previous Next Create

11. Configure the following **Profile Object Settings:**

- From the drop-down list, select the database schema you want to associate with the AI Profile. You can select only one schema for each profile. Based on your selection the list of **Available Datasets** is populated.
- Add a **Filter** to view only selective database schemas in the drop-down list.
- Select the check boxes corresponding to **Tables**, **Views** and/or **Materialized Views** to include those data sets for the AI profile to have access.
- From the **Available Datasets**, double-click or drag and drop the ones that you want to include for the AI profile for access. The selected datasets move to the list of **Profile Datasets**.

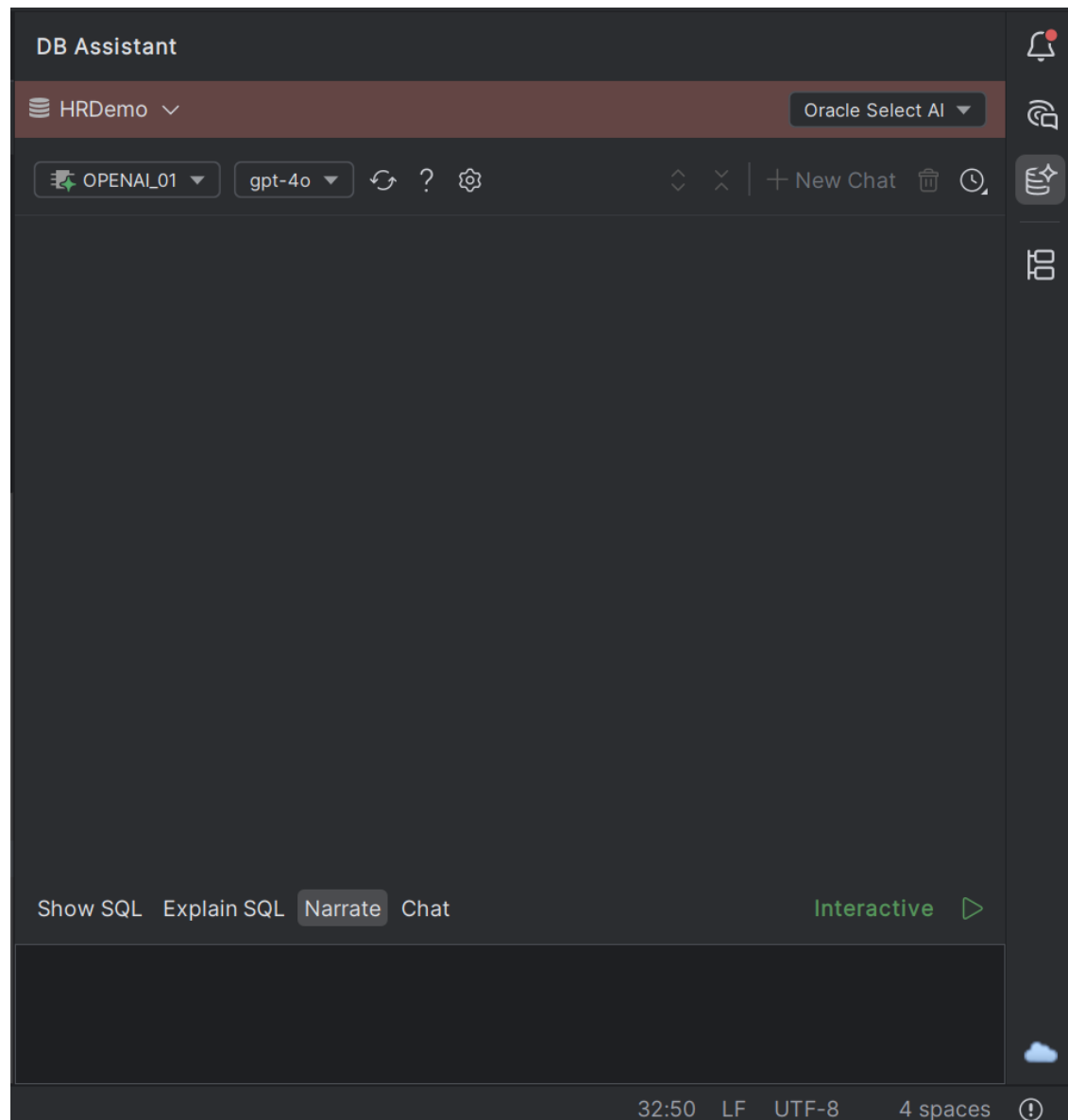
12. Click **Create.**

The new AI Profile is stored in the database and can be viewed under the database Schema > AI Profiles section in the DB Browser window. The new Profiles are also listed on the **DB Navigator - Select AI Profiles and Credentials** dialog box > **Profiles** tab.

Working with Select AI

This topic provides an overview of interaction with DB Assistant module using Select AI.

You can start interacting with the DB Assistant through the available chat box by entering your input prompts in natural language. You can also click the **+ New Chat** icon on the DB Assistant window and start a dedicated chat, which you can save by providing a **Chat Name**. Conversations that are saved with a Chat Name can be accessed later from the **Chat History**. You can also delete a saved chat thread from the **Chat History**.



Based on the Profile you select, your conversation can be:

- **Interactive** (Submit icon on chat box is Green in color) - If the **Profile** has the "Conversational" flag enabled (profile name displays a green icon), Select AI remembers the context of the last 10 prompts you enter, and generates responses based on previous prompts.

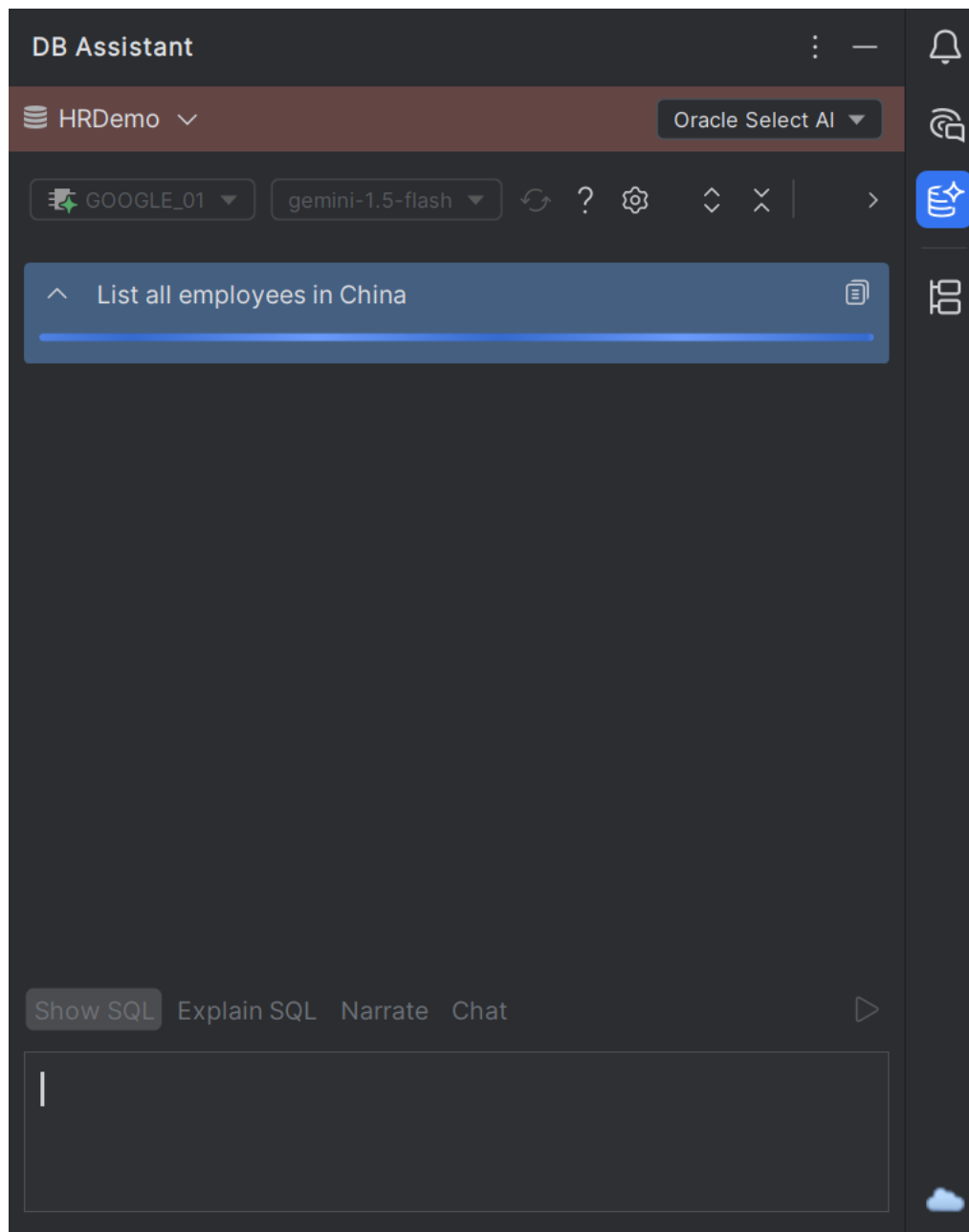
- **Non-Interactive** (**Submit** icon on chat box is Yellow in color) - If the **Profile** has "Conversational" flag disabled (profile name displays a yellow icon), each prompt you enter is considered independent of each other and you have to specify the context explicitly each time.

The following actions are available on the chat box to provide further insights into the generated AI response:

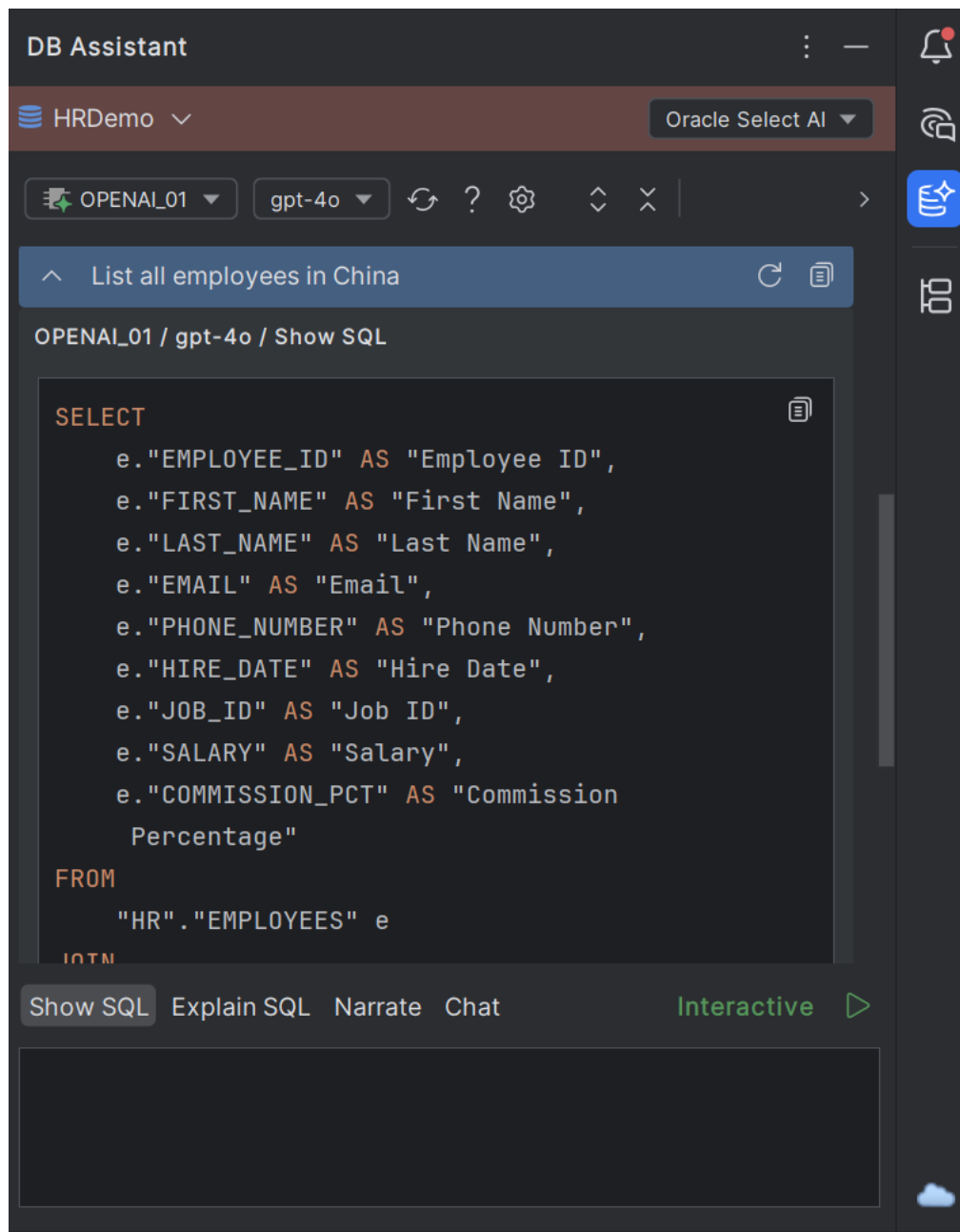
- **Show SQL** - get an executable SQL query in the response
- **Explain SQL** - get the explain plan for the SQL query generated in the response
- **Narrate** - ask for the DB assistant to narrate the generated response
- **Chat** - get explanations in natural language

Submitting a prompt in the chat box of the DB Assistant window triggers execution of the input by Oracle Select AI and the output is displayed in the window. You can re-run the input prompt multiple times to get variations of the output. Additionally, you can copy the generated response and use it for further data manipulation.

Sample input submitted in DB Assistant chat window

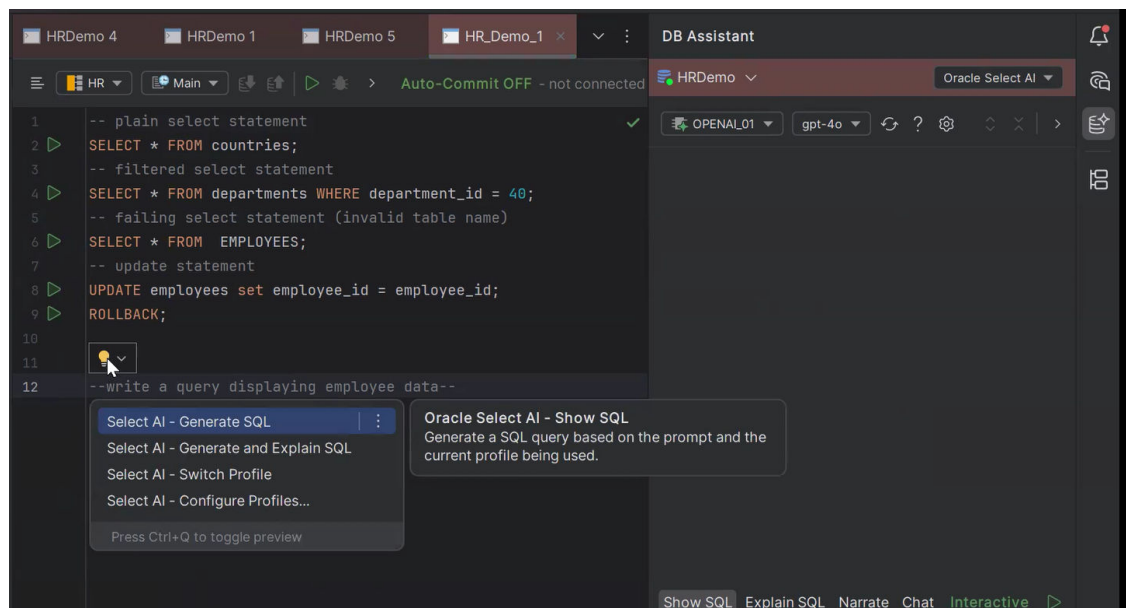


Sample response generated for the input prompt

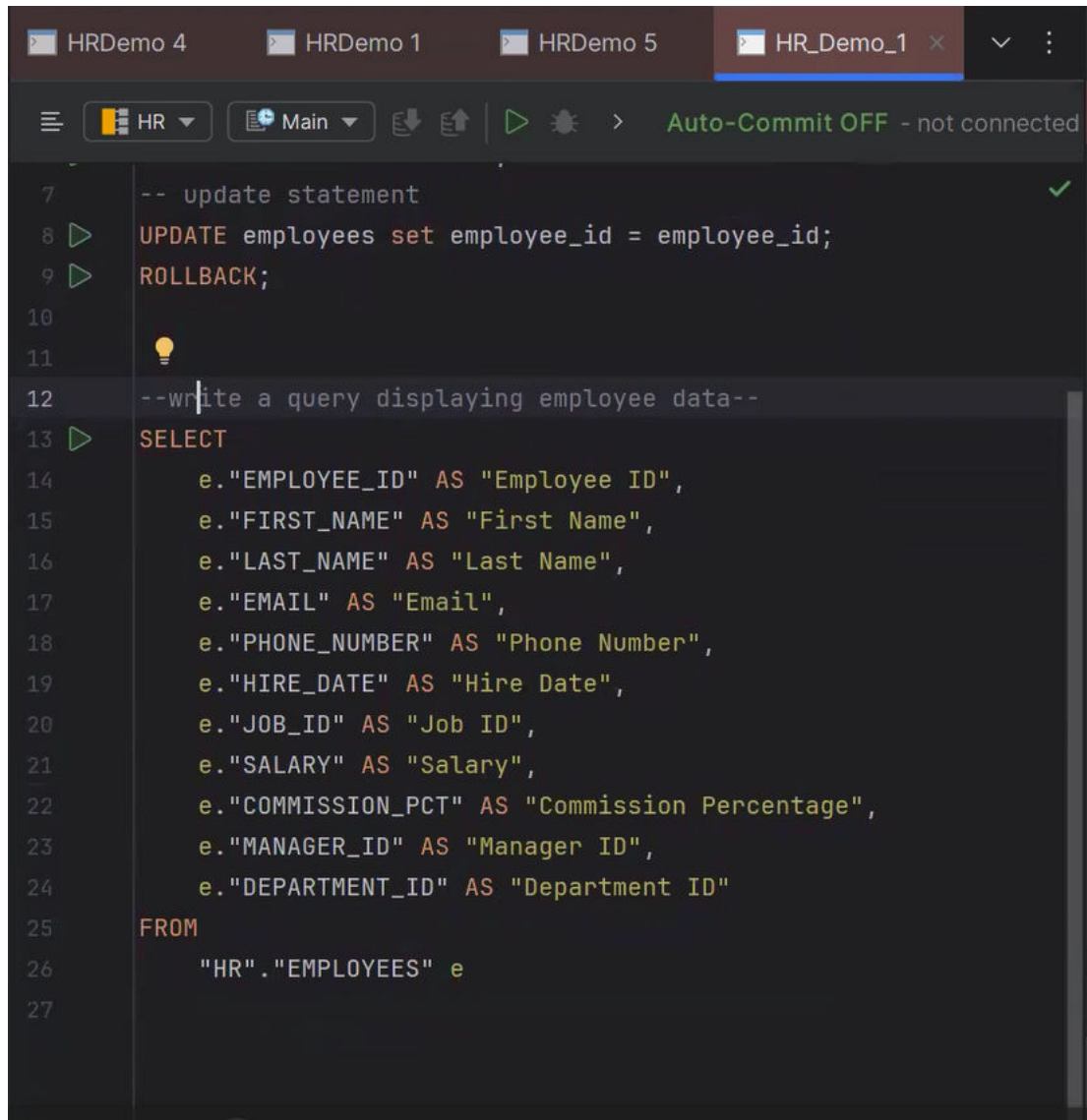


Oracle Select AI features are also integrated within the data/code editors. To use the Select AI capabilities directly in the editors and consoles, you must have Oracle Select AI enabled for that connection. You must also have enabled AI Profiles available for that database connection.

For example, you can generate a SQL statement directly on a console by clicking the **Show Console Actions** (bulb) icon and then selecting the Select AI - Generate SQL option.



The Select AI generated SQL statement displays on the console window.



```
7      -- update statement
8      UPDATE employees set employee_id = employee_id;
9      ROLLBACK;
10
11      
12      -- write a query displaying employee data--
13      SELECT
14          e."EMPLOYEE_ID" AS "Employee ID",
15          e."FIRST_NAME" AS "First Name",
16          e."LAST_NAME" AS "Last Name",
17          e."EMAIL" AS "Email",
18          e."PHONE_NUMBER" AS "Phone Number",
19          e."HIRE_DATE" AS "Hire Date",
20          e."JOB_ID" AS "Job ID",
21          e."SALARY" AS "Salary",
22          e."COMMISSION_PCT" AS "Commission Percentage",
23          e."MANAGER_ID" AS "Manager ID",
24          e."DEPARTMENT_ID" AS "Department ID"
25      FROM
26          "HR"."EMPLOYEES" e
27
```

Following context actions can be performed on DBN data editor integrated with Select AI:

- **Select AI - Generate SQL** - Generates the SQL statement corresponding to the current context of the code.
- **Select AI - Generate and Explain SQL** - Generates the requested SQL statement and also provides explanatory comments for the statement.
- **Select AI - Switch Profile** - Displays the list of available Profiles in Select AI that you can select and switch over to generate SQL statements.
- **Select AI - Configure Profiles** - Opens the **DB Navigator - Select AI Profiles and Credentials** window to add/edit/view the AI profiles and credentials for Select AI.

Public LLMs

This topic provides an overview of the public LLMs supported in the DB Assistant module.

In addition to Oracle Select AI, the **DB Assistant** module also utilizes other popular AI models provided by public LLM providers such as OpenAI, Google, Cohere AI, Hugging Face, and Anthropic among others. You can choose from any of the supported language models and use AI credentials to securely access the AI profiles corresponding to a language model, and start interacting with DB assistant. Providing a natural language input in the chat box generates an AI response as processed by the selected public LLM.

Public LLMs have access to tools and services (access is approved or denied by the user/administrator) to facilitate gathering and processing of source codes, datasets, and corresponding metadata along with other connection information.

- [Creating Credentials for Public LLMs](#)
This topic describes the procedure to create AI credentials to work with public LLMs.
- [Creating AI Profiles for Public LLMs](#)
This topic describes the procedure to create AI Profiles to work with public LLMs.
- [Working with Public LLMs](#)
This topic provides an overview of interaction with DB Assistant module when using a public LLM.

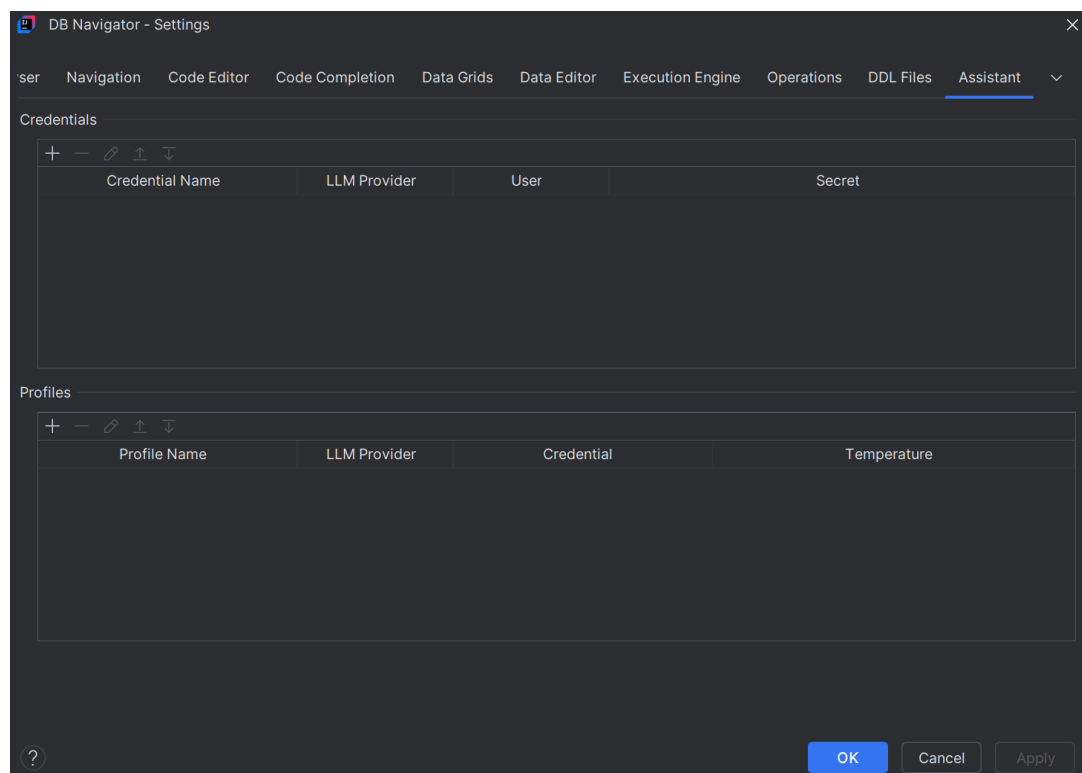
Creating Credentials for Public LLMs

This topic describes the procedure to create AI credentials to work with public LLMs.

You can create credentials that are used to access language models offered by public LLM providers. These credentials when used along with an AI profile, allows you to access the public LLMs to interact with your data.

Follow these steps to create a new AI credential for public LLMs:

1. From the Main menu of the Database Navigator toolbar, select **DB Navigator > Settings > Assistant** tab.



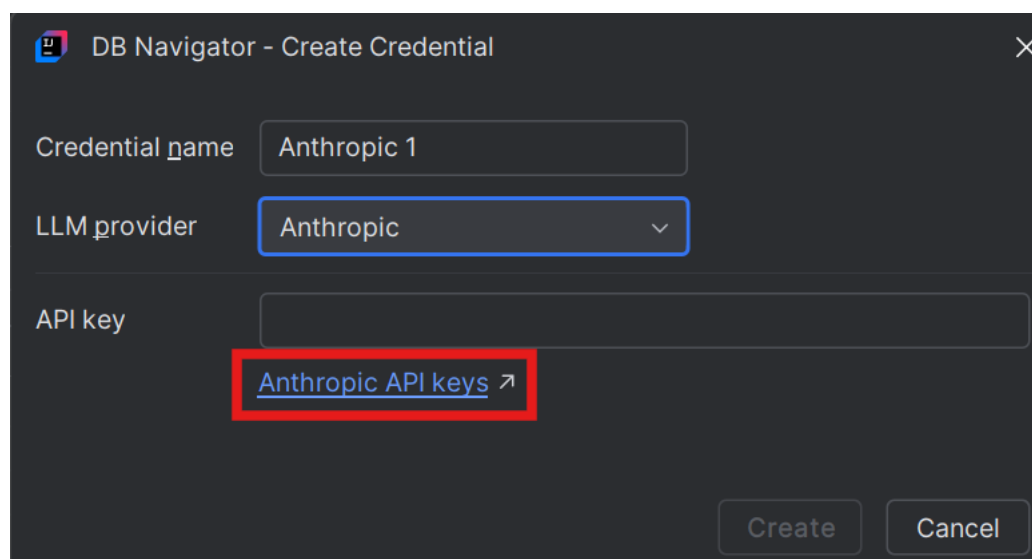
2. In the **Credentials** section, click the **Add (+)** icon to open the **DB Navigator - Create Credential** dialog box.

The image shows the 'DB Navigator - Create Credential' dialog box. It contains four input fields: 'Credential name' with the value 'Credential 1', 'LLM provider' which is a drop-down menu, 'User', and 'Password'. At the bottom right, there are 'Create' and 'Cancel' buttons.

3. Fill in the following details in the **DB Navigator - Create Credential** dialog box:
 - **Credential Name** - Provide a name to identify the credential.
 - **LLM Provider** - From the drop-down list, select the LLM for which you are creating the user credential. Options include:
 - OCI Generative AI
 - Open AI

- Google
 - Anthropic
 - Mistral AI
 - X AI
- **User** - Provide the username if you have not selected any **LLM Provider** in the above field.
 - **Password** - Provide the secret password if you have not selected any **LLM Provider** in the above field.
 - **API Key** - If you select a public LLM in the **LLM Provider** field, provide an API key to use as a secret. The API key is required for all public LLMs, except if you select OCI Generative AI from the above drop-down.

If you do not have an existing API key, you can create a new key from the AI provider's web portal (such as Google AI Studio, OpenAI Platform, or Claude Console), for which the link is provided on the **DB Navigator - Create Credential** dialog box.



DB Navigator - Create Credential

Credential name: Anthropic 1

LLM provider: Anthropic

API key: [Anthropic API keys ↗](#)

Create Cancel

If you select **OCI Generative AI** option as the **LLM Provider**, you need to enter the following **OCI Configuration** details.

Using Config File based Configuration Type:

DB Navigator - Create Credential

Credential name

OCI Connection Config

LLM provider

OCI Generative AI

OCI Configuration

Config type

File (~/.oci/config)

Config file

Config profile

Compartment OCID

ocid1.compartment.oc1..

Create

Cancel

Field	Description
Config Type	Select the type of OCI configuration you want. Options include File and Custom . Selecting the File option for OCI configuration asks you to provide the following details.
Config File	Select the folder (<code>.oci</code> directory in your user's home directory) to upload the configuration file containing user details such as user OCID, tenancy OCID, region, fingerprint of the public key and the private key file path.
Config Profile	Select the profile (drop-down displays all available profiles in the configuration file selected above) to connect to a specific tenancy within the OCI connection.
Compartment OCID	Provide the compartment OCID to identify the specific compartment within the OCI tenancy.

Using Custom Configuration Type:

DB Navigator - Create Credential

Credential name

OCI Connection Config

LLM provider

OCI Generative AI

OCI Configuration

Config type

Custom

User OCID

ocid1.user.oc1..

Tenancy OCID

ocid1.tenancy.oc1..

Compartment OCID

ocid1.compartment.oc1..

Private key file

Fingerprint

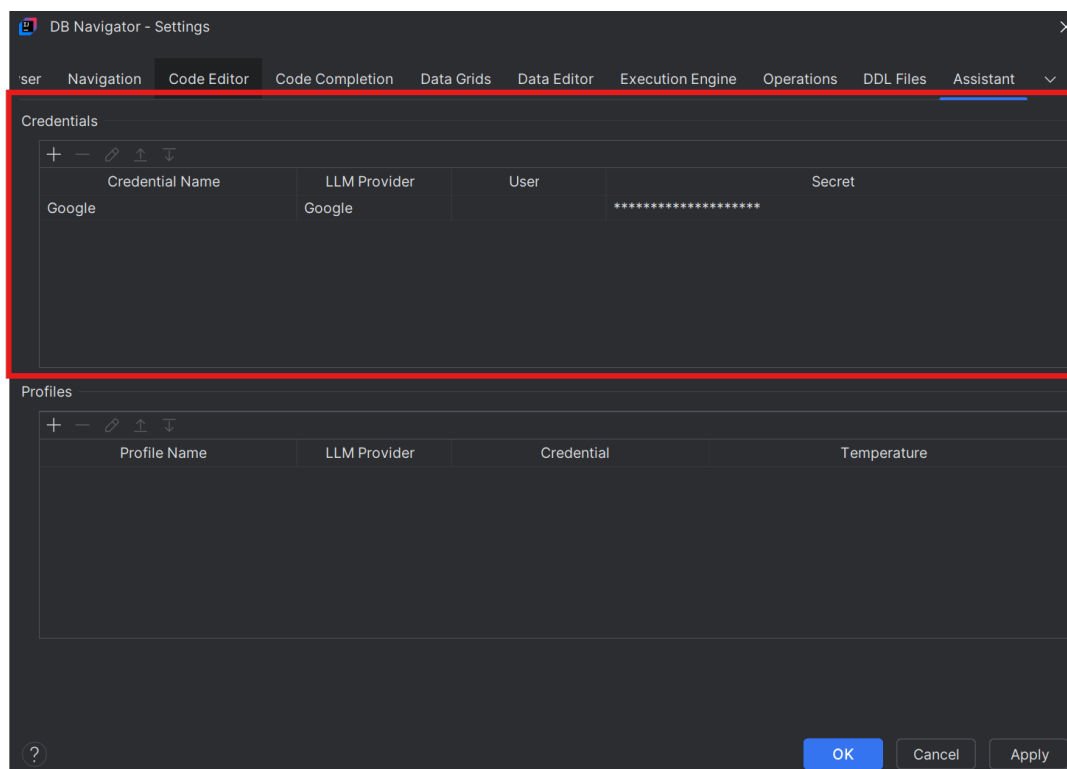
Create

Cancel

Field	Description
Config Type	Select the type of OCI configuration you want. Options include File and Custom . Selecting the Custom configuration type asks you to provide the following details.
User OCID	Enter the unique OCID of the user.
Tenancy OCID	Enter the unique OCID of the connection tenancy.
Compartment OCID	Enter the unique OCID of the tenancy compartment.
Private Key File	Select the downloaded Private key file saved in your <code>.oci</code> directory.
Fingerprint	Provide the fingerprint of the Private key that you added above,

4. Click **Create**.

The new user credential is created and displayed in the list of credentials on the **DB Navigator - Settings** window.



You are also presented with the option of creating a new Credential while creating a Profile. The Credential is associated with a Profile, and together used to access the language model.

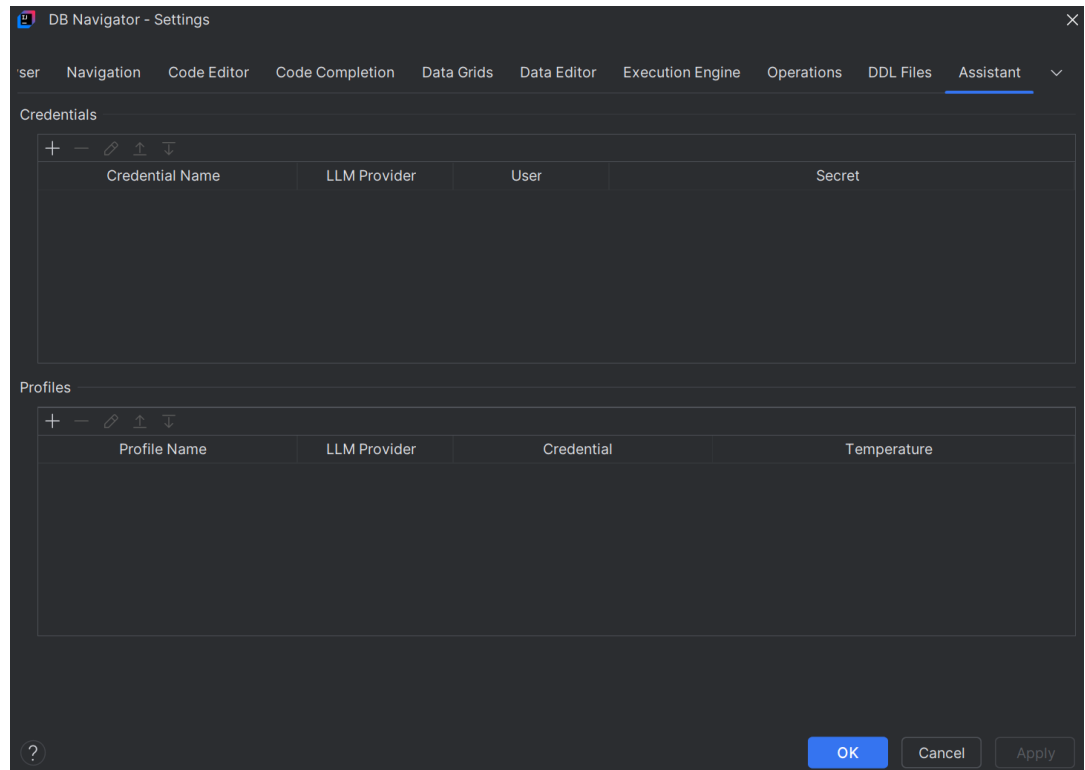
Creating AI Profiles for Public LLMs

This topic describes the procedure to create AI Profiles to work with public LLMs.

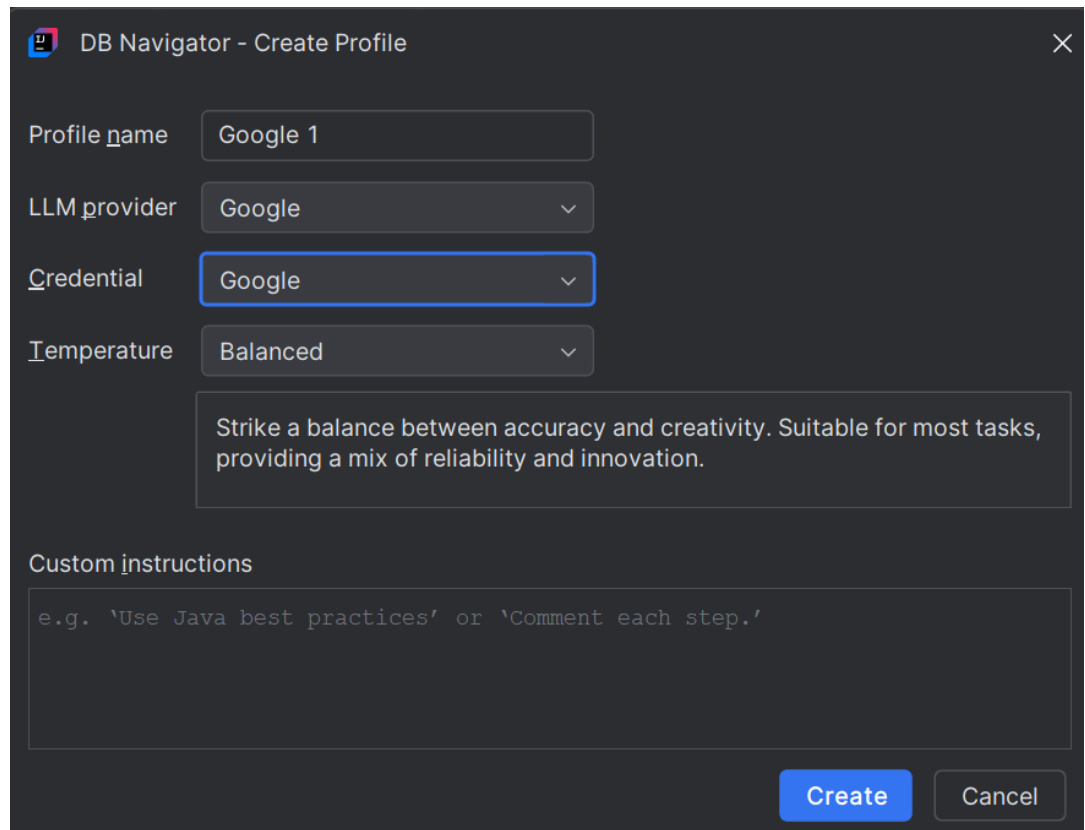
AI Profiles in DB Assistant enables you to select a Large Language Model and provide access of the data, metadata, and database connection information to the LLMs through MCP services in order to generate AI responses.

Follow these steps to create a new Profile for public LLMs:

1. From the Main menu of Database Navigator toolbar, select **DB Navigator > Settings > Assistant** tab to open the **DB Navigator - Settings** window for DB Assistant.



2. Click **Add Profile** icon (+) in the **Profiles** section to open the **DB Navigator - Create Profile** dialog box.



3. Provide the following information for the new AI Profile:

- **Profile Name** - Enter a name to identify the AI profile.
- **LLM Provider** - From the drop-down list, select the public LLM Provider, such as Google, OpenAI, Anthropic, Mistral, and OCI Generative AI.

Note

By default, the **Profile Name** displays as "Profile 1", if there are no existing profiles. The count of the default profile name thereafter increases along with the number of existing profiles. On selecting the **LLM Provider** in the next field, the default **Profile Name** changes to indicate the name of the provider. For example, if you select Google as the **LLM Provider**, the **Profile Name** changes to "Google 1". You can change the default **Profile Name** into a custom name for the profile.

- **Credential** - From the drop-down list, select an AI Credential to use along with the Profile. If credentials are not available, click the **+ New Credential** option in the drop-down to open the **DB Navigator - Create Credential** dialog box and complete creation of a user credential to use with the AI profile. See [Create Credentials for Public LLMs](#).
- **Temperature** - Select from the following pre-defined temperature options to fine-tune the LLM generated response (making it extremely precise or elaborate):
 - Precise
 - Balanced
 - Exploratory
 - Experimental
 - Custom (Selecting this option enables you to configure the temperature settings using the Temperature slide bar)

DB Navigator - Create Profile

Profile name: Google 1

LLM provider: Google

Credential: Google

Temperature: Custom

Manually adjust the temperature to fine-tune the response generation. Allows for precise control over the balance between accuracy and creativity.

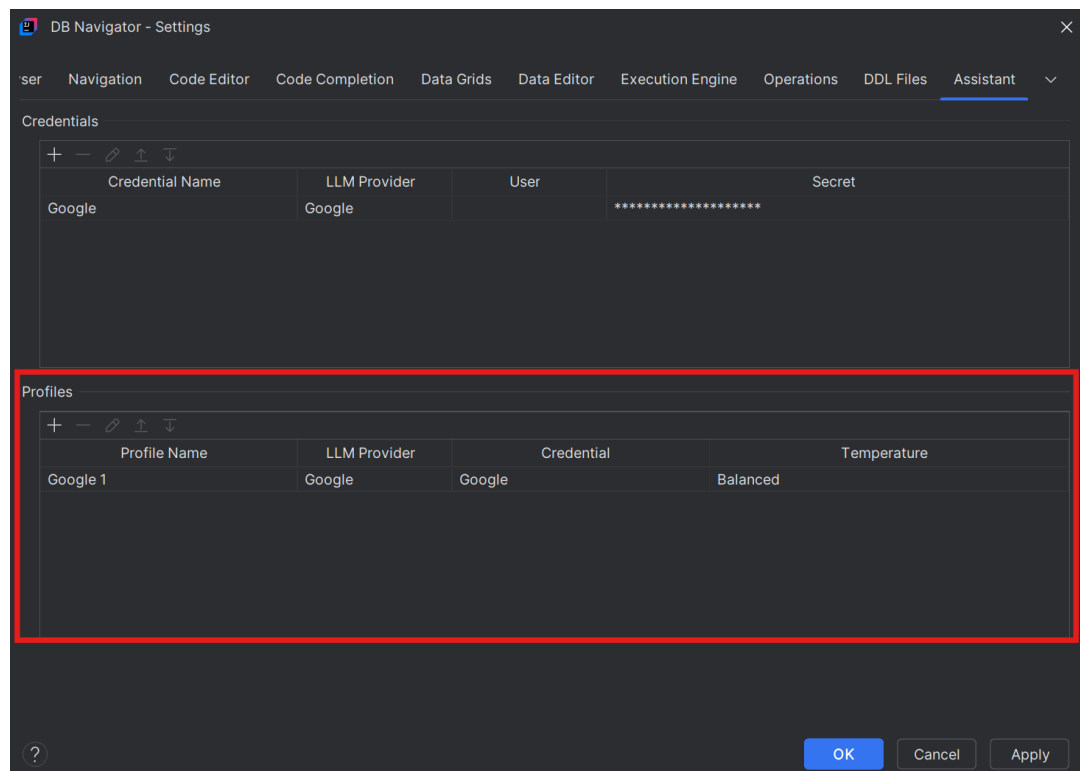
0 0.2 1

Custom instructions

e.g. 'Use Java best practices' or 'Comment each step.'

Create Cancel

- **Custom Instructions** - (Optional) Provide any special instructions to the LLM that will be taken into account while generating the AI responses.
4. Click **Create**.
- The new AI profile is added to the list of existing **Profiles**.

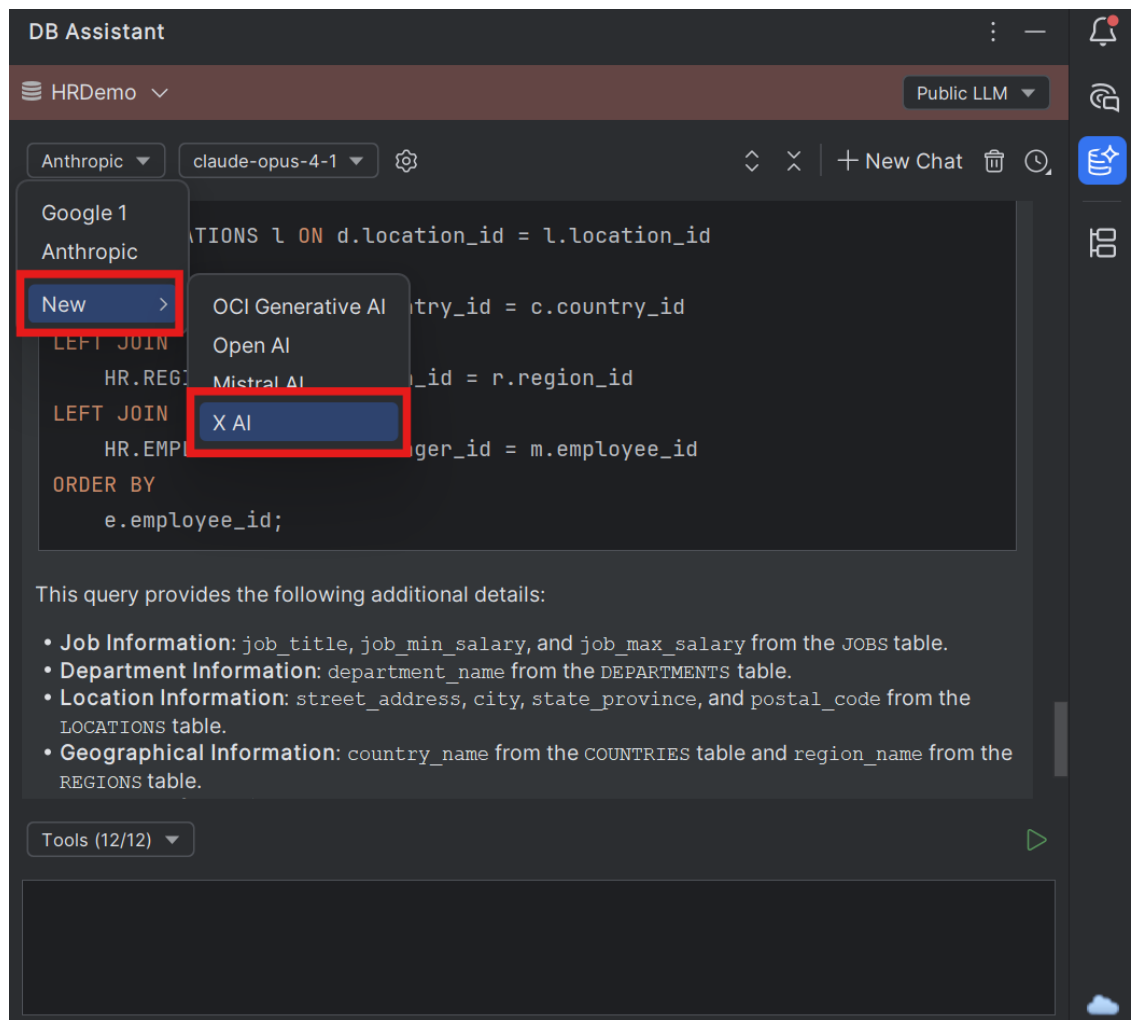


The profiles you create are also available as options of the **Choose AI Profile** drop-down field in the **DB Assistant** window toolbar, when working with Public LLMs.

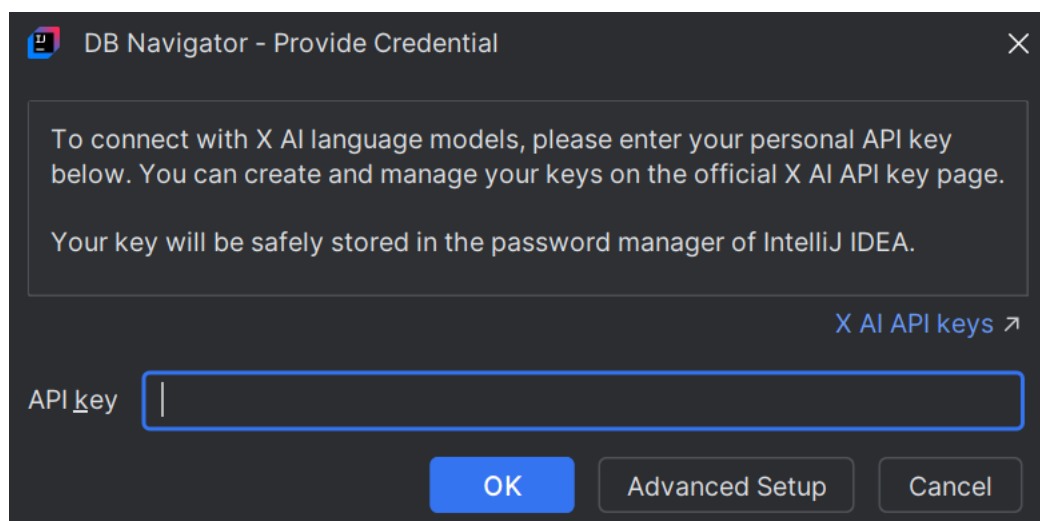
5. Click **OK** to close the **DB Navigator - Settings** window.

If AI Profiles are not available for an LLM Provider, it is possible to create an implicit profile that will be saved locally in the Database Navigator settings, allowing you to interact with the public LLM.

To create an implicit profile, open the **DB Assistant** window with **Public LLM** mode selected in the window banner. From the **AI Profiles** drop-down list, select **New**, followed by the LLM provider for which profiles are not listed.



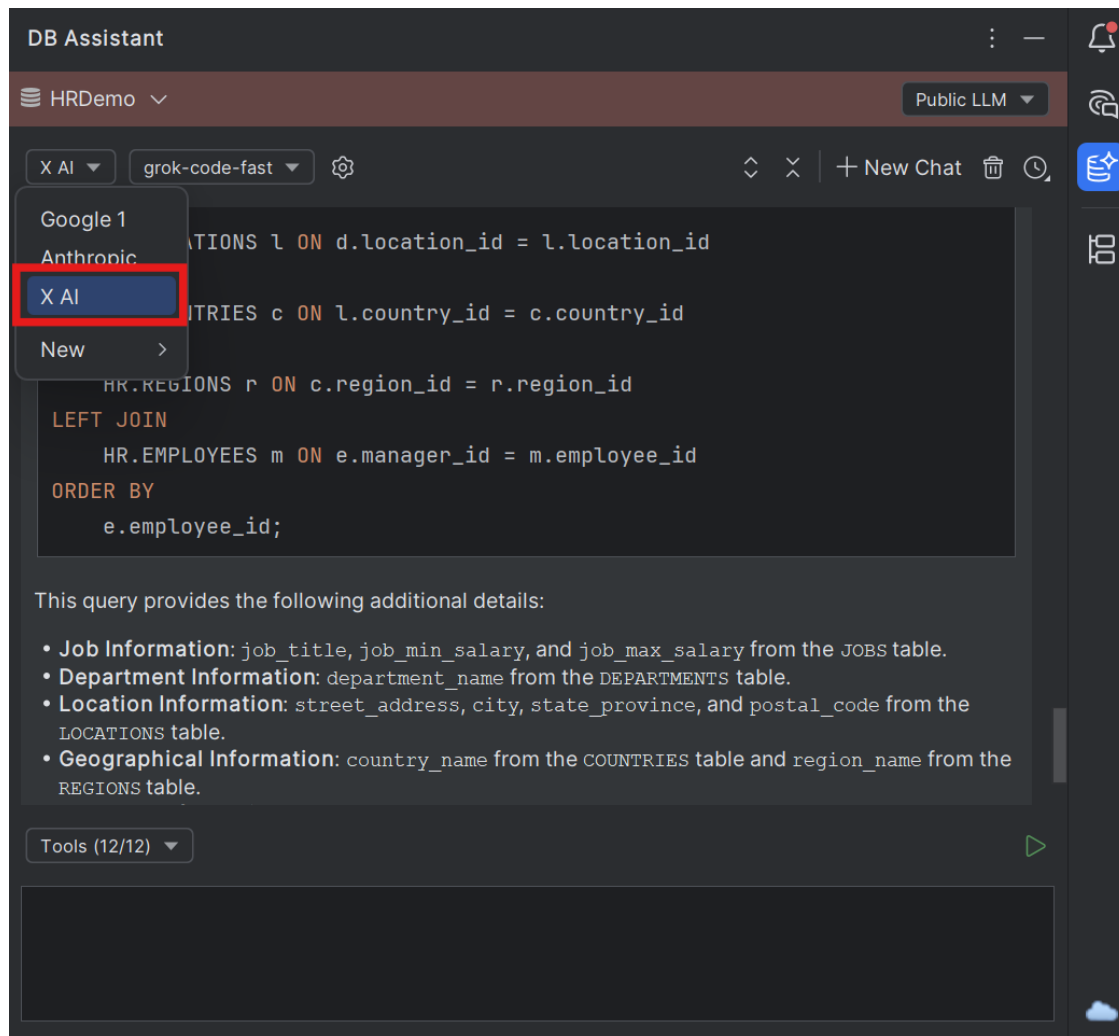
The **DB Navigator - Provide Credential** dialog box opens.



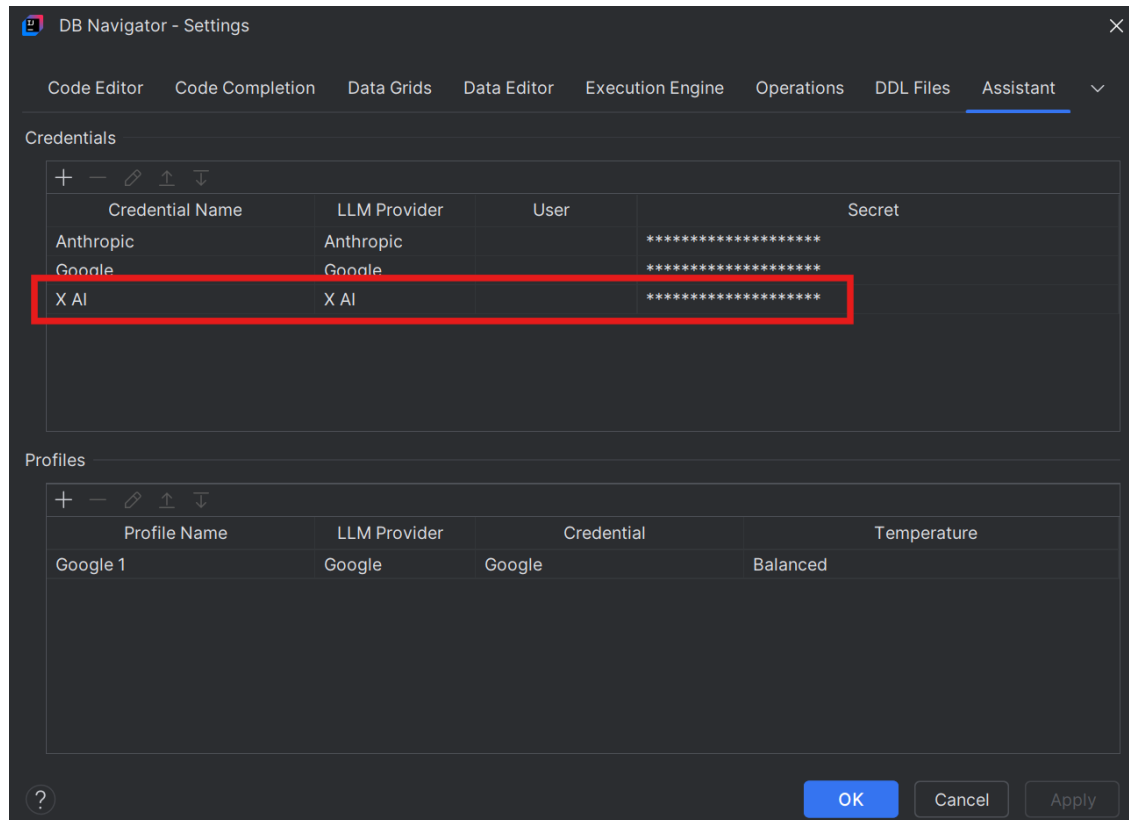
Provide the **API key** and click **OK**.

If you want to customize the implicit profile further to add custom instructions and control the LLM temperature, you can do so through the **Advanced Setup** button.

The implicit Profile for that LLM provider is created and listed in the **AI Profiles** drop-down list. You can select this profile and a corresponding Language Model available to start interacting with the LLM.



A temporary credential corresponding to the implicit profile gets listed on the **DB Navigator Setting** page > **Assistant** tab > **Credentials** section.

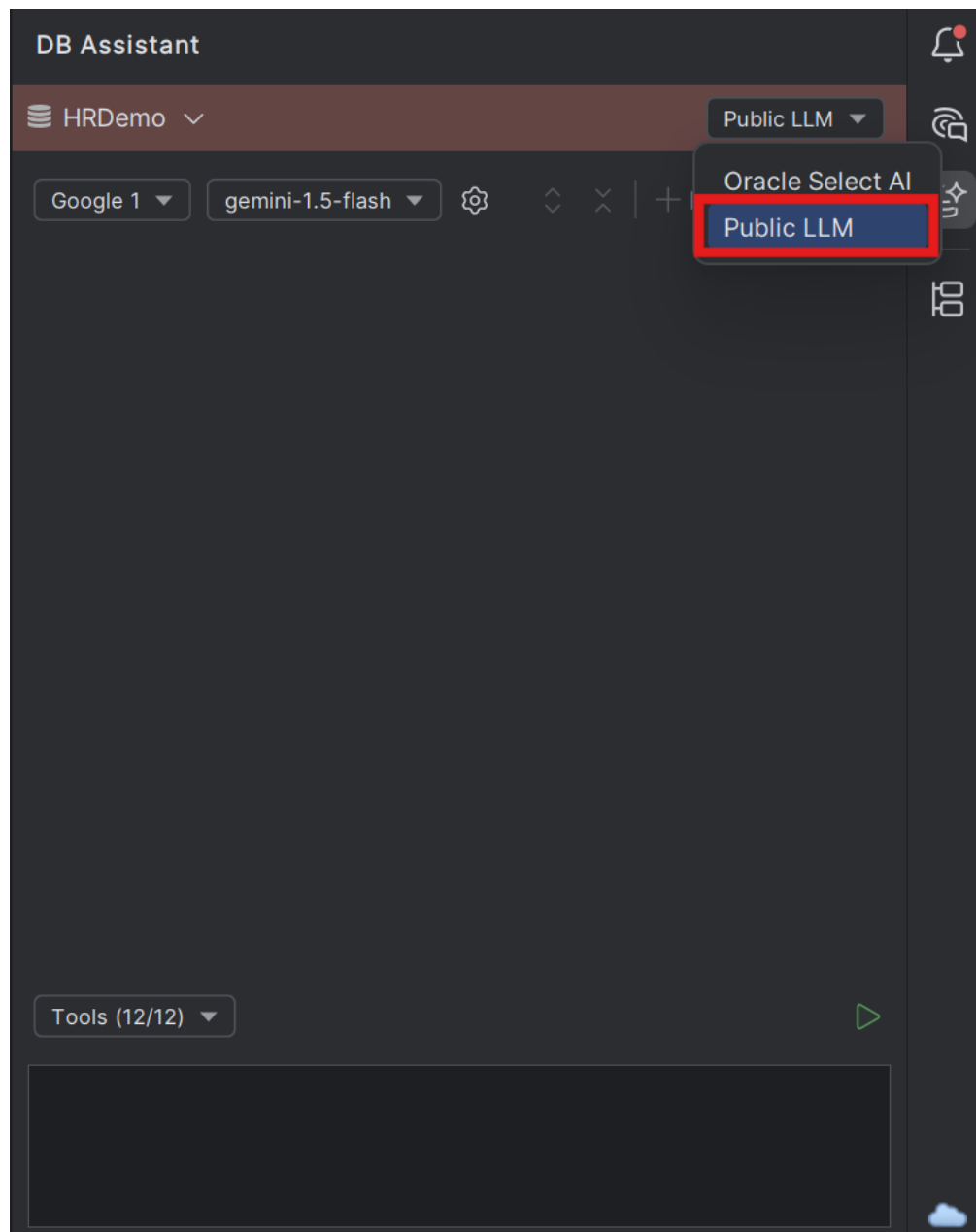


Working with Public LLMs

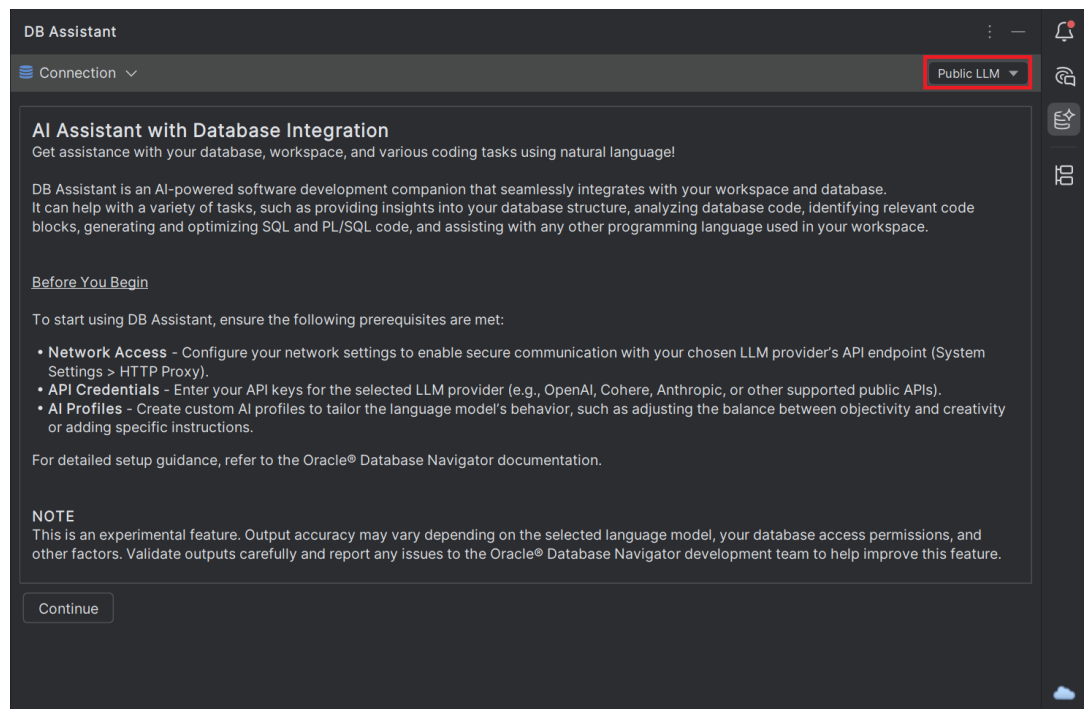
This topic provides an overview of interaction with DB Assistant module when using a public LLM.

To use public LLMs for interacting with your database and get insights to your code and data set in a conversational manner:

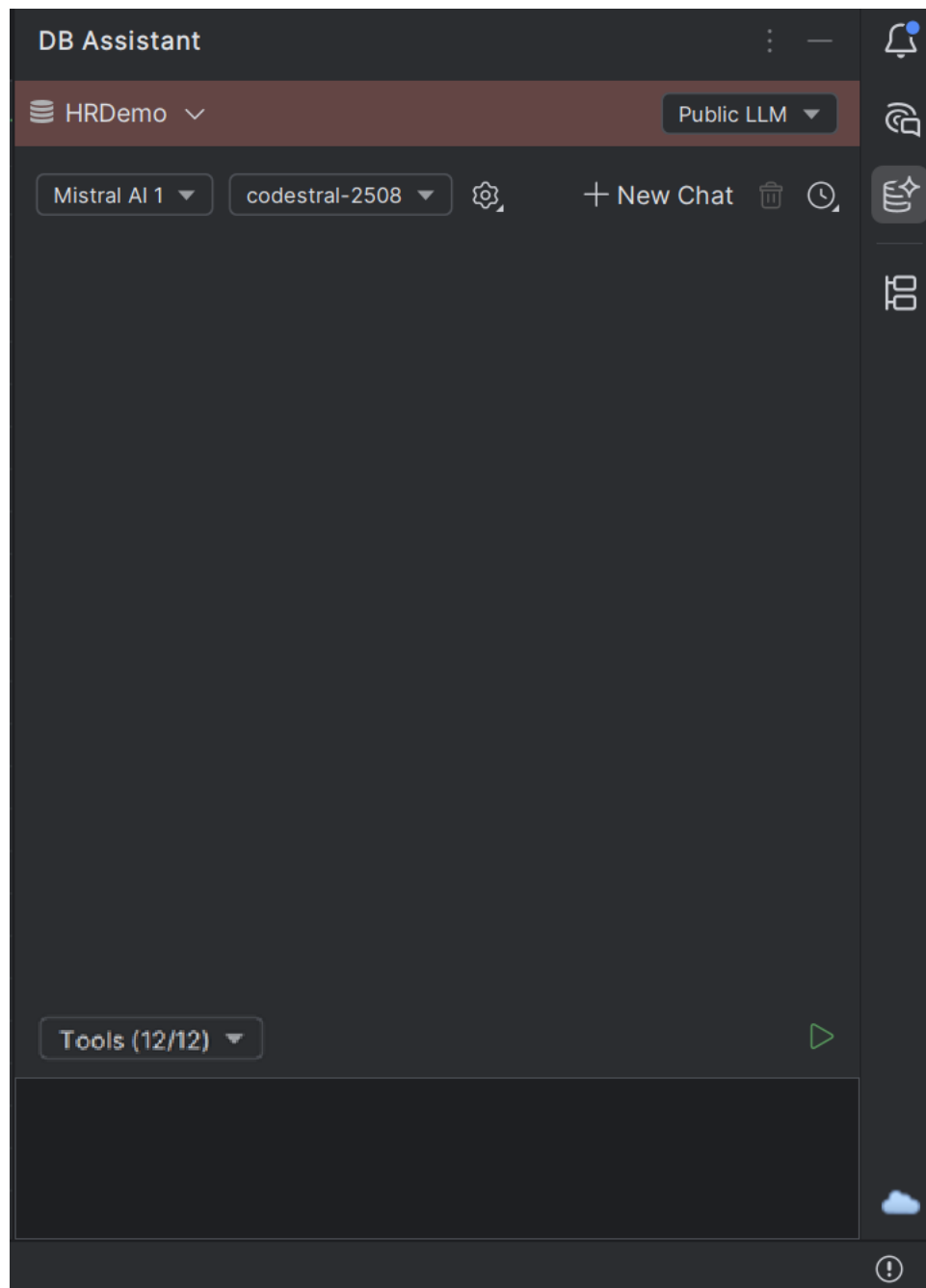
1. Start by selecting a database connection for which you require AI assistance from the banner of the DB Assistant window.
2. Next, select the **Public LLM** option from the drop-down list displayed on DB Assistant window banner.



3. When you select **Public LLM** mode for the first time, a disclaimer message is displayed for your review that you must read and then click **Continue** to proceed.



4. From the DB Assistant window drop-down fields, select the **AI Profile** and the **Language Model** you want to use.

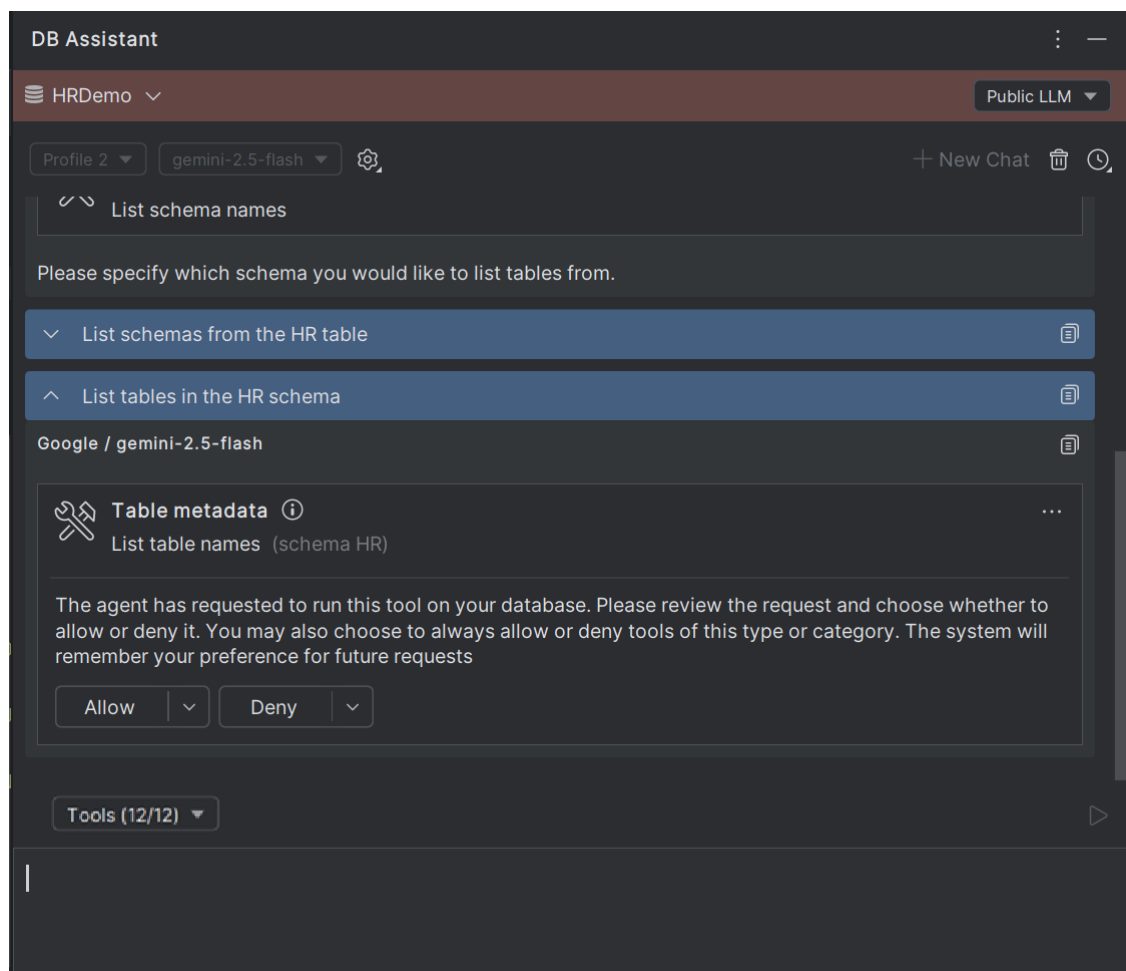


5. Start typing your inputs in the DB Assistant chat box or click the **+ New Chat** icon to start conversing with the DB Assistant in a dedicated chat thread and press **Enter** (or click the **Submit** icon).

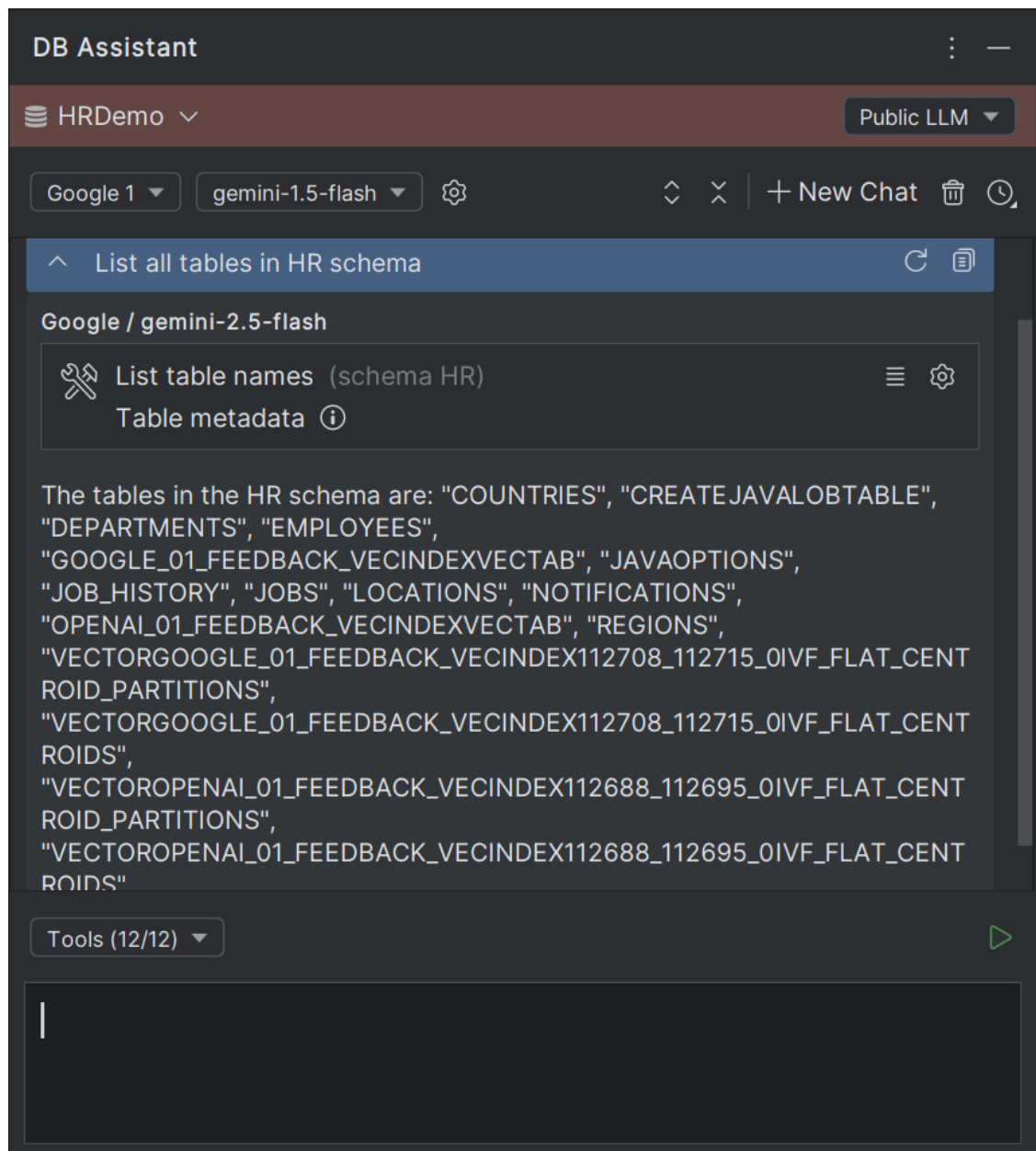
Sample Interaction with DB Assistant

The following example cites a common interaction with the DB Assistant using *Google Gemini-1.5-Flash* AI model.

Start typing an input prompt in the chat box and press **Enter** (or click the **Submit** icon). The selected public LLM is invoked.



Based on your inputs, the database and workspace integration is provided through MCP services, and the database information from the specific connection is fed to the LLMs. The integration is done through invoking certain MCP tools which act as third-party models, where you can manage the access of these tools by approving (Allow/Allow All) or blocking (Deny/Deny All) their access to the language models being used.



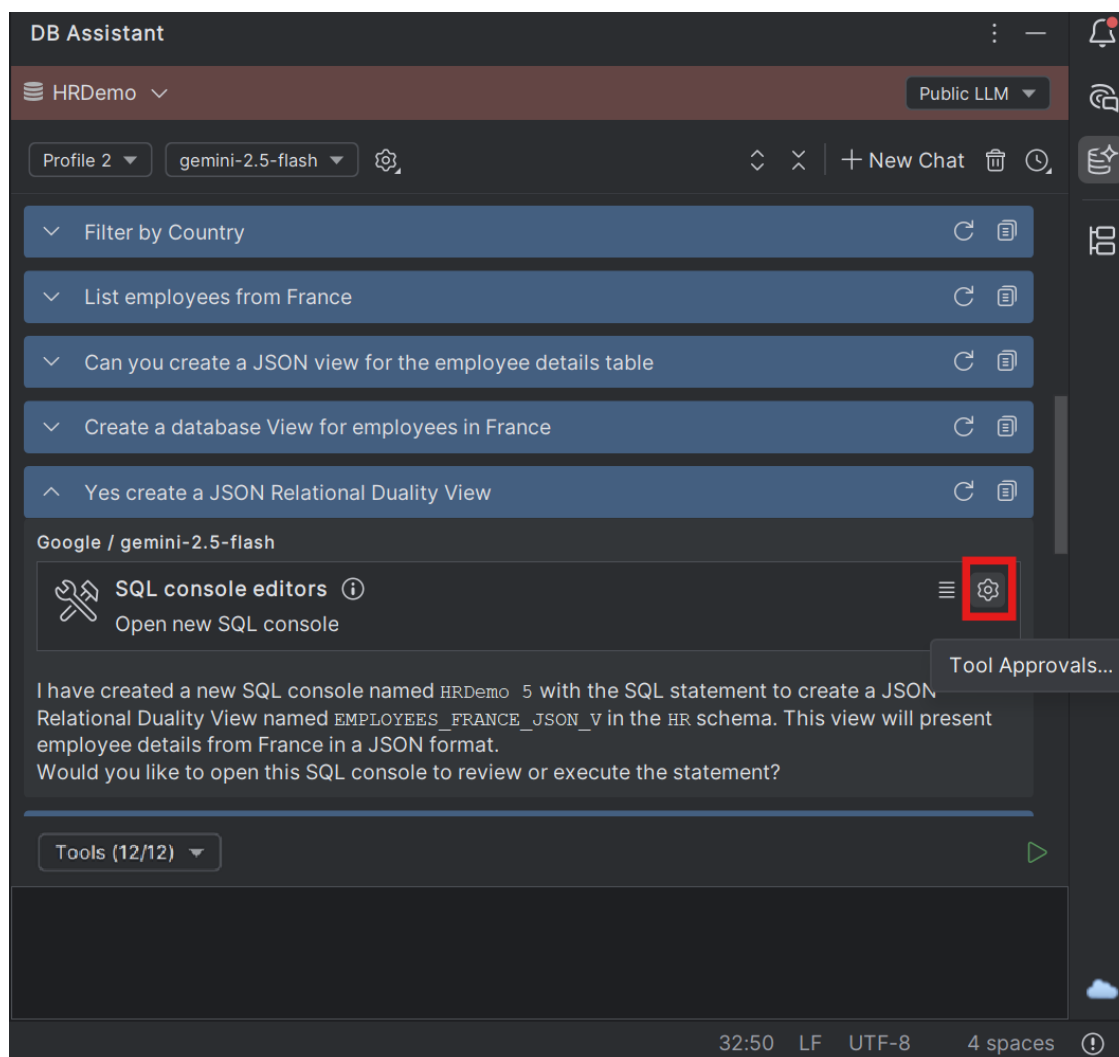
The AI agent may ask for confirmation for accessing the DB information such as the follows:

- Metadata information (including database metadata, table metadata, schema metadata, view and program metadata).
- Database connection configuration information.
- View (including views, materialized views, JSON relational duality views) and Program source code access.
- SQL consoles, source code editors and data editors in the IDE.
- [Tool Approvals and Tool Data](#)
This topic provides an overview of the tools invoked by language models to access data and database information.

Tool Approvals and Tool Data

This topic provides an overview of the tools invoked by language models to access data and database information.

To process a query, the AI agent invokes certain tools and services. Each invocation first verifies that access to use that tool is provided. If an invoked tool is not already approved for access, the DB Assistant asks for access in a confirmation message, describing the tool's capabilities and the information that will be exposed to the LLM. You can "Allow" or "Deny" or "Block" access to a Tool (or Tool Category).



Click the **Tool Approvals** icon displayed on the confirmation window asking for tool access. The **DB Navigator - Assistant Tool Settings** window opens where you can review and configure the tools and services invoked by the LLM to access database information and process data. The Tool Categories and the Tools in each category can be "Approved", "Prompted", or "Blocked" for access by user/administrator.

- Tools (or tool categories) marked as "Approved" are invoked automatically.
- Tools (or tool categories) marked as "Blocked" are not visible to the LLMs.

- Tools (or tool categories) marked as "Prompted" throw a confirmation prompt for approval before every invocation.

DB Navigator - Assistant Tool Settings

OLHR

This is an overview of all tools available to the Database Assistant. It allows you to determine which tools the language model can access.

You can manage tool access by enabling or disabling entire tool categories, as well as individual tools.

The status of a tool determines its visibility to the LLM:

- Tools marked as "Approved" will be invoked automatically.
- Tools marked as "Prompted" will be prompted for approval before every invocation.
- Blocked tools will not be visible to the LLM.

Metadata provider ⓘ

Database metadata

Information about the database type, name, and version

Prompted

Schema metadata

Information about database schemas and catalogs

Prompted

Table metadata

Information about tables in a given schema

Prompted

View metadata

Information about views in a given schema

Prompted

Program metadata

Information about program units (functions, stored procedures, packages, declared types) in a given schema

Prompted

Config information provider ⓘ

Connection information

Information about the database connection (such as database host, port, name, jdbc driver, authentication type, etc.). Client secrets such as passwords or tokens are never exposed, but shown as redacted placeholders to indicate they are required.

Prompted

IDE action invoker ⓘ

SQL console editors

IDE actions for opening and changing SQL consoles (terminals)

Prompted

Source-code editors

IDE actions for editing source-code of database objects

Prompted

Dataset editors

IDE actions for viewing and editing datasets (such as tables, views, materialized views)

Prompted

Source-code provider ⓘ

View source-code

Source code for views, materialized views or json relational duality views

Prompted

Program source-code

Prompted

User's Guide
G40038-01
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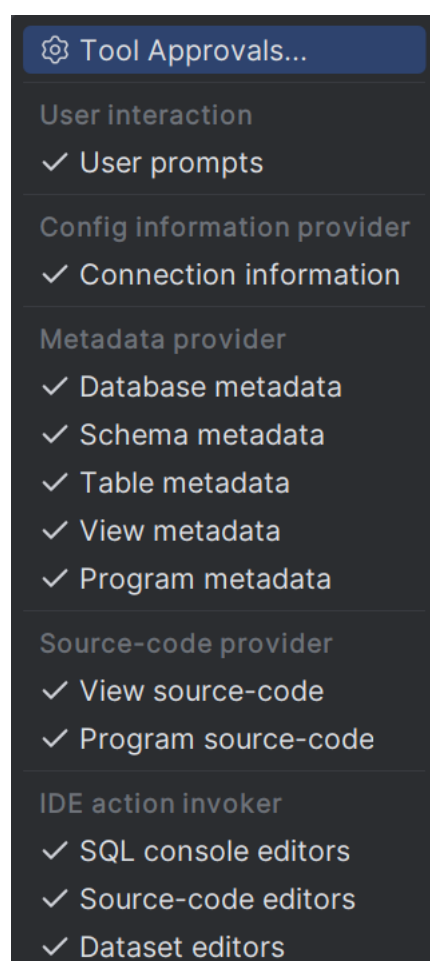
December 5, 2025
Page 42 of 46

By default, all the tools and tool categories are set to "Prompted" indicating that the AI agent will ask for access to those tools if invoked as a response to your input prompt in the DB Assistant chat. You can:

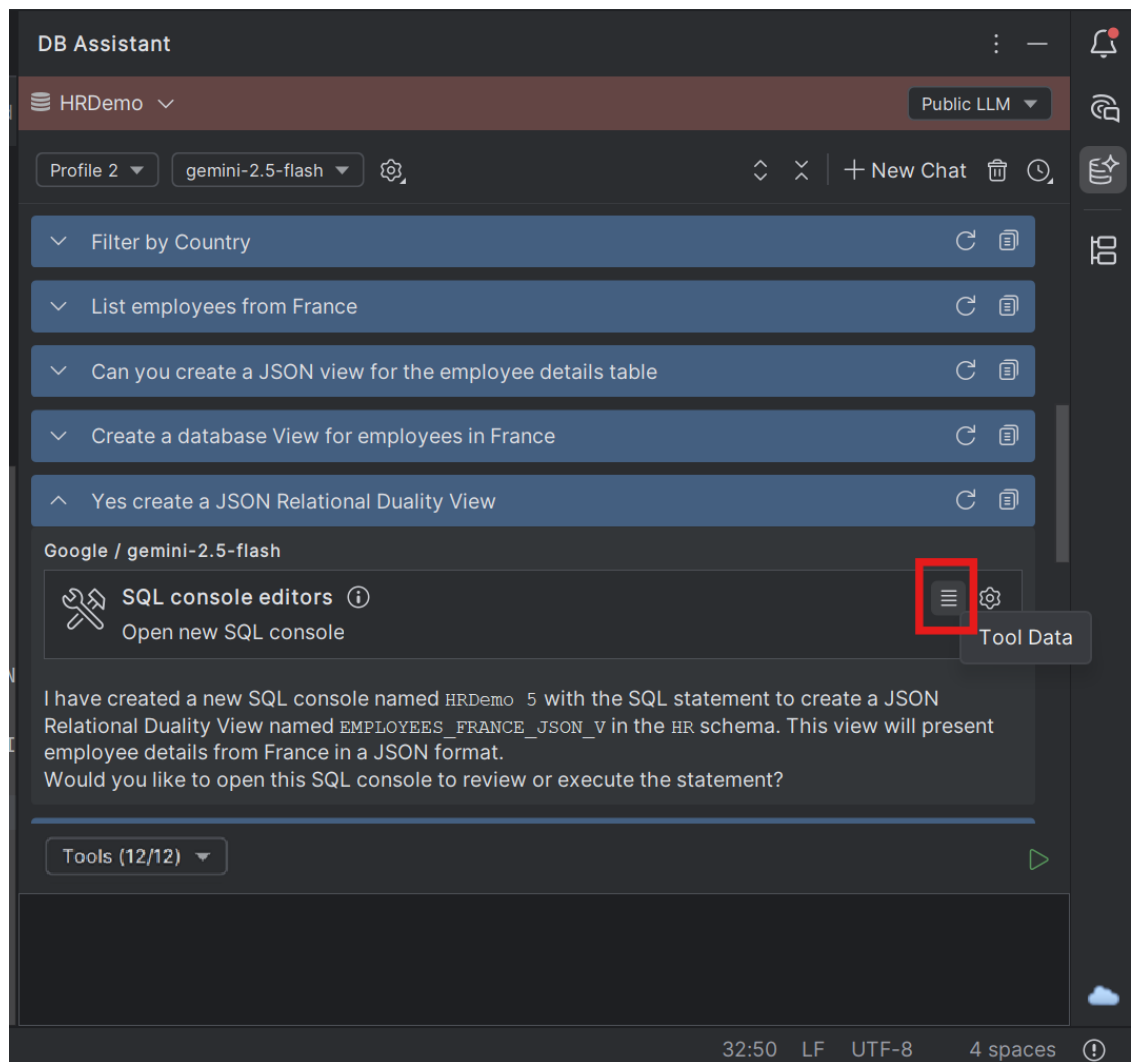
- single-click the "Prompted" button to changed them into "Approved" status providing access to those tools by the LLM
- double-click the button(s) to change them into "Blocked" status denying access to those tools by the LLM.

You can choose to block a specific tool or an entire category of tools or allow unsupervised execution (depending on the sensitivity of the exposed information and the information exposure policies the developer may be subject to).

A consolidated list of all Tools and Tool Categories is accessible from the **Tools** button over the chat box. The button displays the count of tools that are approved or prompted out of the total available tools. A check mark next to the Tool Name indicates that it is either "Prompted" or "Approved".



Click the **Tool Data** icon on the on the confirmation window asking for tool access to open the window displaying the Tool Request and Tool Response exchanged between the invoked tool and the LLM.



You can view the **Tool Request** that the LLM send to the tool (or tool category) being invoked with respect to your prompt and the corresponding **Tool Response** received (response data will be blank till you approve the tool access) from the tool. Additionally, you can view the Tool type, Tool category and tool capability on the Tool Data window.

×

Open new SQL console

Creates a new SQL console with the given content and opens it the IDE (returns the name of the new SQL console)

Tool type

SQL console editors ⓘ

Tool category

IDE action invoker ⓘ

Tool request

```
{  
  "arg0": "CREATE JSON RELATIONAL DUALITY VIEW HR,  
  .EMPLOYEES_FRANCE_JSON_V AS\r\nSELECT\r\n  e.EMPLOYEE_ID AS  
  id,\r\n  e.FIRST_NAME AS firstName,\r\n  e.LAST_NAME AS
```

Tool response

```
HRDemo 5
```

×

List table names

Lists table names in a given schema

Tool type

Table metadata ⓘ

Tool category

Metadata provider ⓘ

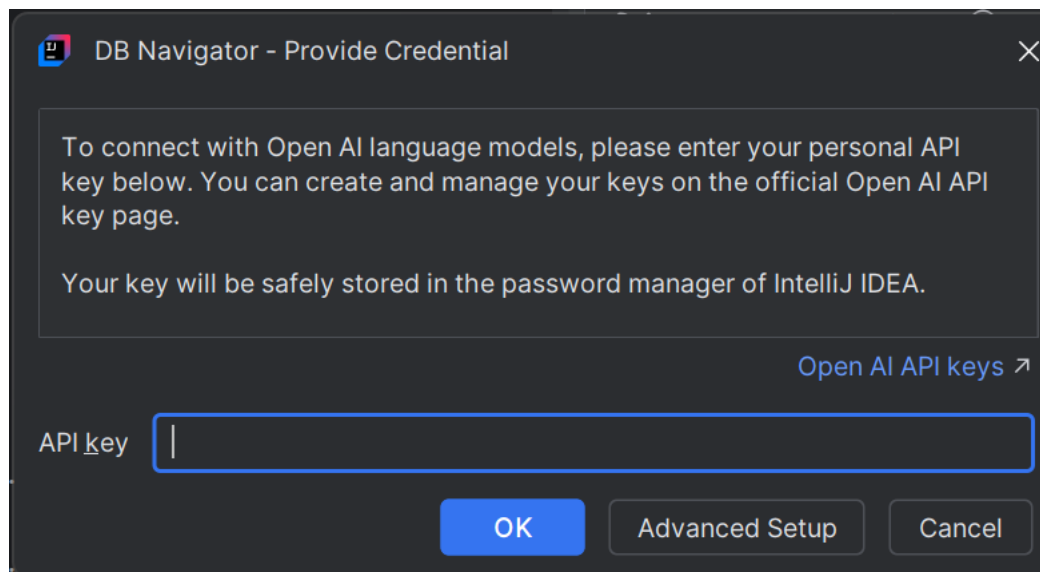
Tool request

```
{  
  "arg0": "HR",  
  "arg1": true,  
  "arg2": true  
}
```

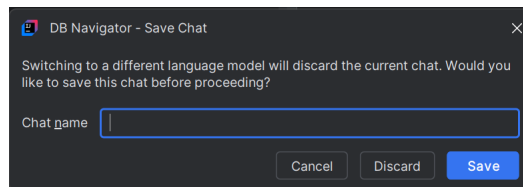
Tool response

```
[  
  "COUNTRIES",  
  "CREATE$JAVA$LOB$TABLE",  
  "DEPARTMENTS",  
  "EMPLOYEES",  
  "GOOGLE_01_FEEDBACK_VECINDEX$VECTAB",
```

To switch between different LLMs for the same interaction, change the **AI Profile** and **Language Model** from the respective drop-down fields on the DB Assistant window. Provide the **API Key** in the **DB Navigator - Provide Credential** dialog box, for the new LLM that you want to use for the ongoing chat.



Additionally, to change the Language Model without changing the AI Profile corresponding to the LLM Provider, first save the ongoing chat and then switch to a different language model.



13

Vector Embeddings

This chapter provides an overview of vector embeddings supported in Oracle® Database Navigator.

Database Navigator plug-in supports Vector data types that forms the basis of generating and storing vector embeddings in databases. Using embedding models, it is possible to transform unstructured data and data from tables into vector embeddings which can then be used for semantic search (instead of keyword-based queries) on business data.

Vector Embeddings are numerical representation of any kind of data (such as text, images, videos, audio, etc.) as points in a multi-dimensional space that describe the semantic meaning behind that data. The vector representation transforms the location of the data points in vector space (like coordinates) and their proximity to others, in a semantically meaningful form.

When performing a similarity search on an attribute of a data object, the vector equivalent of the search query is used to fetch the closest vector matches available for the data object. DBN utilizes Oracle's PL/SQL packages (DBMS_VECTOR and DBMS_VECTOR_CHAIN) to support operations with Oracle Vector AI Search, such as chunking the source data, extracting chunks or embeddings from the data, creating vector index, or processing the data for text generation and summarization, that helps in end-to-end semantic search.

For more information on Vector Embeddings and Oracle Vector AI Search, see [Oracle AI Database Oracle AI Vector Search User's Guide, 26ai](#).

Topics:

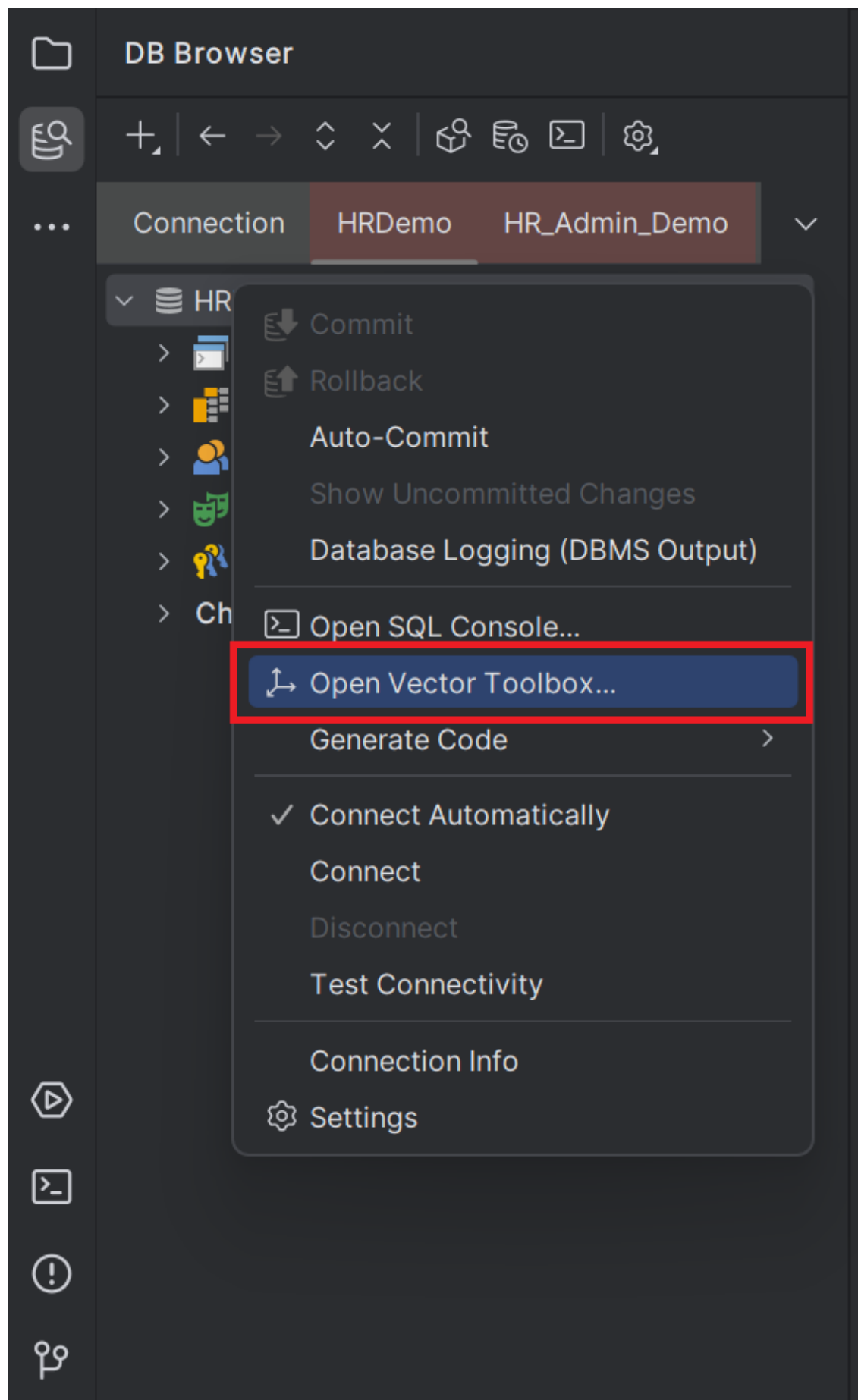
- [Vector Toolbox](#)
This topic describes the functionality of the Vector Toolbox.
- [Vector Database Tables](#)
This topic provides an overview of vector embeddings stored in database tables.

Vector Toolbox

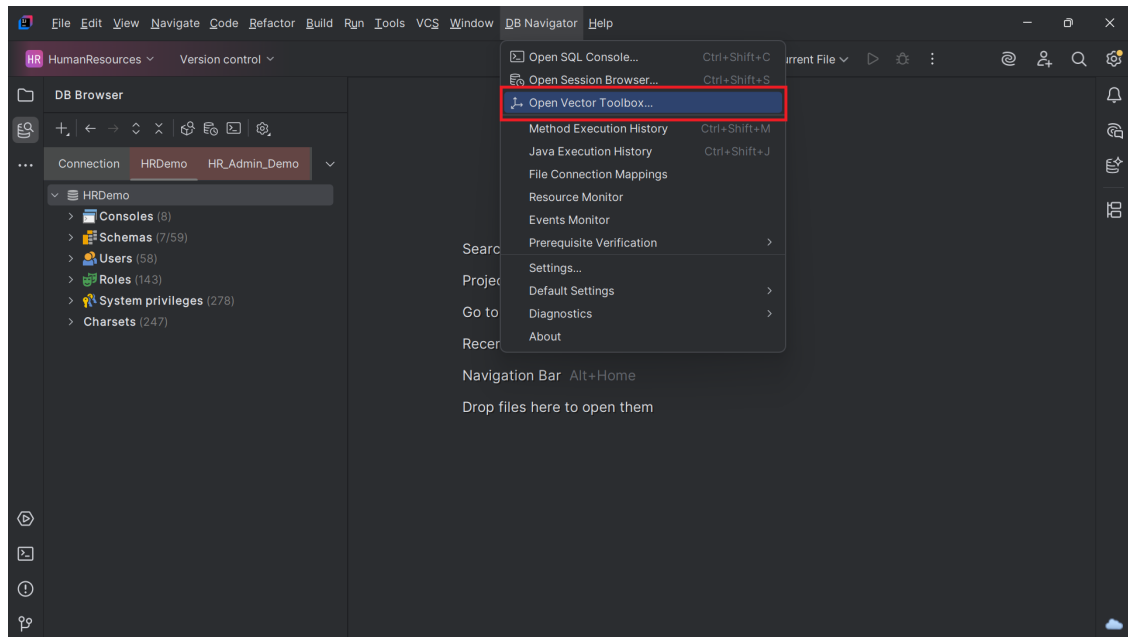
This topic describes the functionality of the Vector Toolbox.

The **Vector Toolbox** in Database Navigator enables you to generate vector embeddings from table data and other non-structured data based on embedding models and embedding parameters that you can configure.

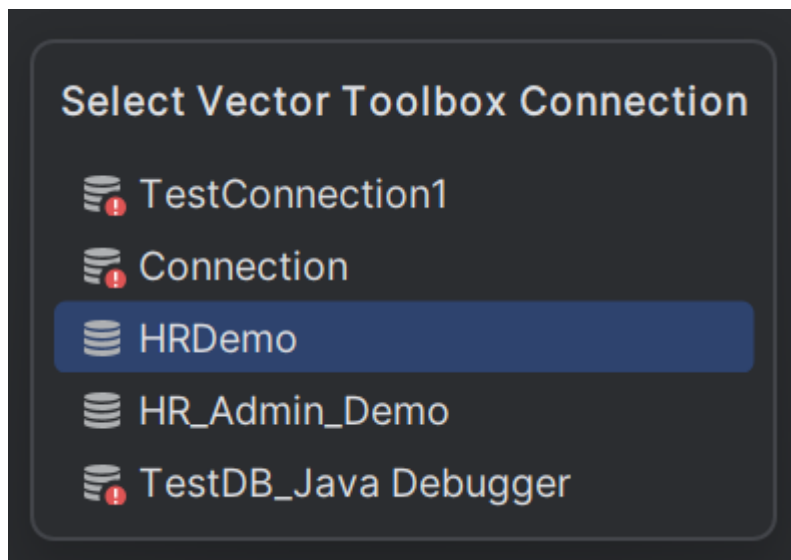
To access the **Vector Toolbox**, from the DB Browser open the database connection and select the **Open Vector Toolbox** option from the context menu (right-click the DB connection).



Alternatively, from the Main menu of Oracle® Database Navigator toolbar, select **DB Navigator > Open Vector Toolbox** option.



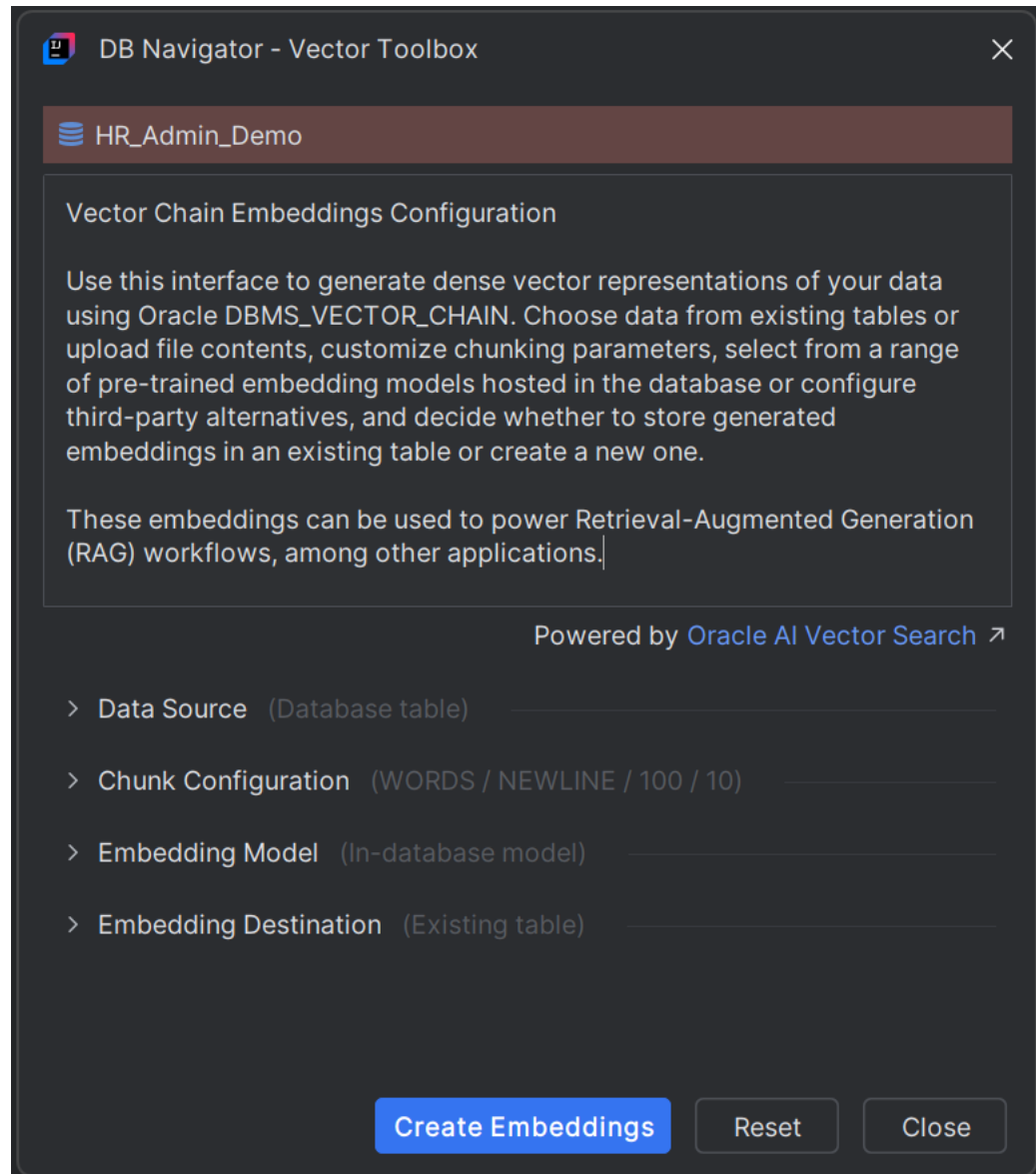
Select the database connection for which you want to access the toolbox.



The **Database Navigator - Vector Toolbox** allows you to generate and store vector embedding from a data source based on an embedding model and save the generated embedding in database tables. Utilizing Oracle's AI Vector Search capabilities, the Vector Toolbox offers advanced operations such as:

- splitting data into smaller segments or chunks
- extraction of plain text from documents

- generating text for a given prompt
- converting data to one or more embeddings
- extracting summary from documents
- creating vector index



- [Generating Vector Embeddings](#)
This topic describes the procedure for generating vector embeddings through the Vector Toolbox.

Generating Vector Embeddings

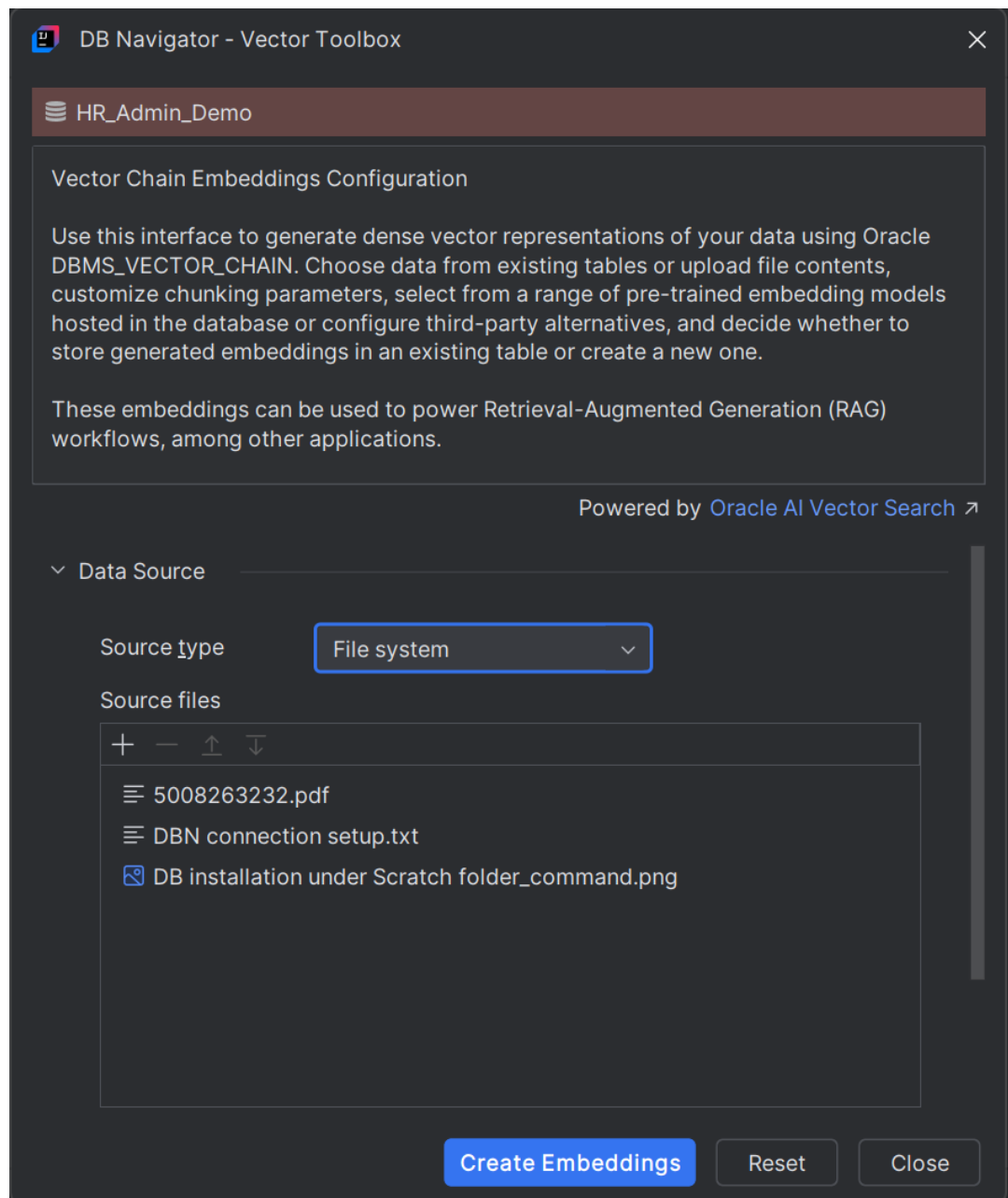
This topic describes the procedure for generating vector embeddings through the Vector Toolbox.

Generation of vector embeddings using the **Vector Toolbox** comprises of four main steps:

1. Selecting a data source (can be a file or database table)
2. Configuring the chunk parameters
3. Selecting or creating an embedding model
4. Selecting the destination to store the embeddings

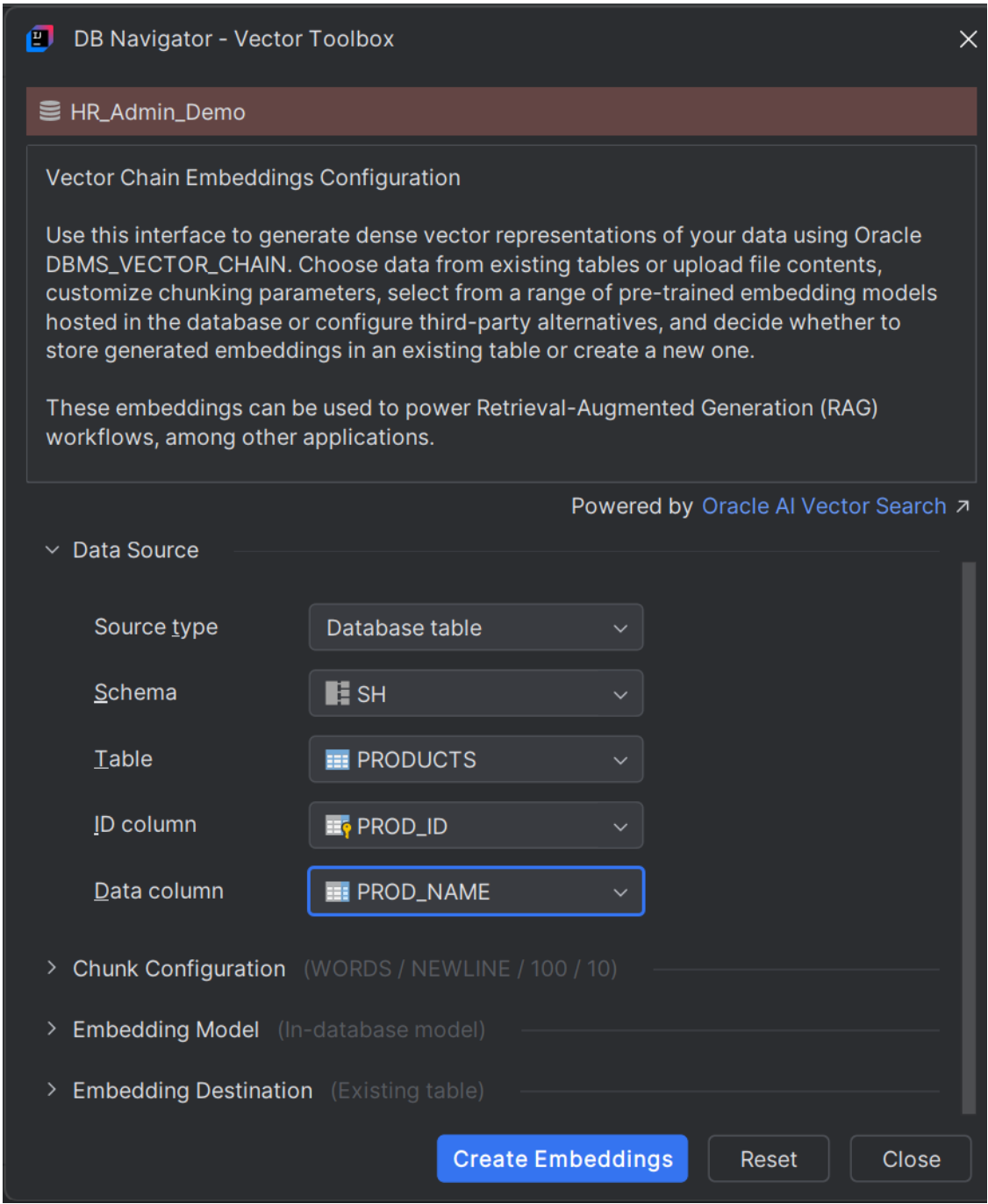
To select a data source, in the **Data Source** section of the **Database Navigator - Vector Toolbox**, select the **Source Type**. **Source Type** options include:

- **File System** - If you select **File System** as the source type, you can upload any file type as the **Source File**. Click the **Add (+)** icon in the **Source File** section and select one or more files from your workstation. You can remove a selected file or change the order in which the source files will be processed.



- **Database Table** - If you select **Database Table** as the source type, you have to further select the following:

Field	Description
Schema	Select the database schema from the DB connection for which you want to generate the embedding.
Table	Select the database table in the schema you selected.
ID Column	Select the column ID of the table for which you want to generate the embeddings.
Data Column	Select the data column of the table for which you want to generate the embeddings.



To chunk or split the selected source file into smaller segments, in the **Chunk Configuration** section of the **Database Navigator - Vector Toolbox**, set the following parameters:

Field	Description
Chunk by	Select the separator or breakpoint to create chunks of the source data. Options include by Words or by Characters .
Max Size	Set the maximum length of each chunk. Smaller chunks result in more precise search matches while larger chunks can lead to less precise results.

Field	Description
Split by	Select the chunking strategy to split the source text. Options include: • Recursively - This method splits the text in a hierarchy of separators used for chunking (for example first by words and then by characters). This method ensures the chunk is small enough to preserve as much context as possible while maintaining the set max size. • Sentence - This method splits the text after every sentence. • Newline - This method splits the text at every new line. • Blankline - This method splits the text at every blank line that appears. • Space - This method splits the text at every encountered space. • None - Select this if you do not want to split the source text.
Overlap	Set the overlap percentage indicating the number of tokens or characters shared between consecutive chunks. This parameter helps in maintaining continuity and ensuring that important data near chunk boundaries are not lost. 10% - 25% overlap of chunk size is considered ideal.

 DB Navigator - Vector Toolbox 

 HRDemo

Vector Chain Embeddings Configuration

Use this interface to generate dense vector representations of your data using Oracle DBMS_VECTOR_CHAIN. Choose data from existing tables or upload file contents, customize chunking parameters, select from a range of pre-trained embedding models hosted in the database or configure third-party alternatives, and decide whether to store generated embeddings in an existing table or create a new one.

These embeddings can be used to power Retrieval-Augmented Generation (RAG) workflows, among other applications.

Powered by [Oracle AI Vector Search](#) 

> Data Source (File system - 1 files)

> Chunk Configuration

Chunk by

WORDS

Max size

100

Split by

NEWLINE

Overlap

10

%

Open Chunk Lab

> Embedding Model (In-database model - HR.DEMO_MINI_LM)

> Embedding Destination (Existing table)

Create Embeddings

Reset

Close

To test the effects of chunking on your source file, click **Chunk Lab** button to open the **DB Navigator - Chunk Lab** dialog box.

DB Navigator - Chunk Lab

Use this tool to experiment with different chunking settings before applying them in embedding and retrieval workflows. Adjust the parameters, preview the resulting chunks, and fine-tune the configuration that works best for your data.

Chunk by CHARACTERS
 Max size 100

Split by NEWLINE
 Overlap 10 %

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

Test Chunk Configuration

	Chunk offset	Chunk length	
1	1	64	"Legal Entity" shall mean the union of th
2	65	63	and all other entities that control, are co
3	128	96	or are under common control with that e
4	224	70	"control" means (i) the power, direct or i
5	294	69	direction or management of such entity,
6	363	73	otherwise, or (ii) ownership of fifty perc
7	436	66	outstanding shares, or (iii) beneficial ow

Use Configuration

Cancel

You can set the chunking parameters and paste a sample text of your source file and click **Test Chunk Configuration** to get a preview of the output before applying them in the actual embeddings. Once satisfied with the chunk output, click **Use Configuration** to apply the same for generating final embeddings.

To set up an AI embedding model for converting data into vector embeddings, in the **Embedding Model** section of the **DB Navigator - Vector Toolbox**, first select the **Model Location**. **Model Location** can be one of the following:

Model Location	Description
In-database Model	In-database AI embedding models are integrated or closely coupled within the database system so that the database itself handles the transformation of raw data stored within into vector embeddings. As a user (with adequate privileges), you have direct control over the in-database model's configuration and updates.
Third-party Model	Third-party AI embedding models are offered by external vendors (LLM providers) as a service or a platform, such as a cloud-based API, deployed separately from the database. Raw data is sent from the database to the third-party service for generating vector embeddings and then sent back to the database for storage.

For **In-database Model**, provide the following information:

- **Schema** - Select the database schema where the embedding model is located.
- **Model** - Select the Model name to use for generating the vector

 DB Navigator - Vector Toolbox ✕

 HR_Admin_Demo

Vector Chain Embeddings Configuration

Use this interface to generate dense vector representations of your data using Oracle DBMS_VECTOR_CHAIN. Choose data from existing tables or upload file contents, customize chunking parameters, select from a range of pre-trained embedding models hosted in the database or configure third-party alternatives, and decide whether to store generated embeddings in an existing table or create a new one.

These embeddings can be used to power Retrieval-Augmented Generation (RAG) workflows, among other applications.

Powered by [Oracle AI Vector Search](#) ↗

> Data Source (File system - 1 files)

> Chunk Configuration (WORDS / NEWLINE / 100 / 10)

▼ Embedding Model

Model location

In-database model ▼

Schema

 HR ▼

Model

 DEMO_MINI_LM ▼ 

> Embedding Destination (Existing table)

Create Embeddings

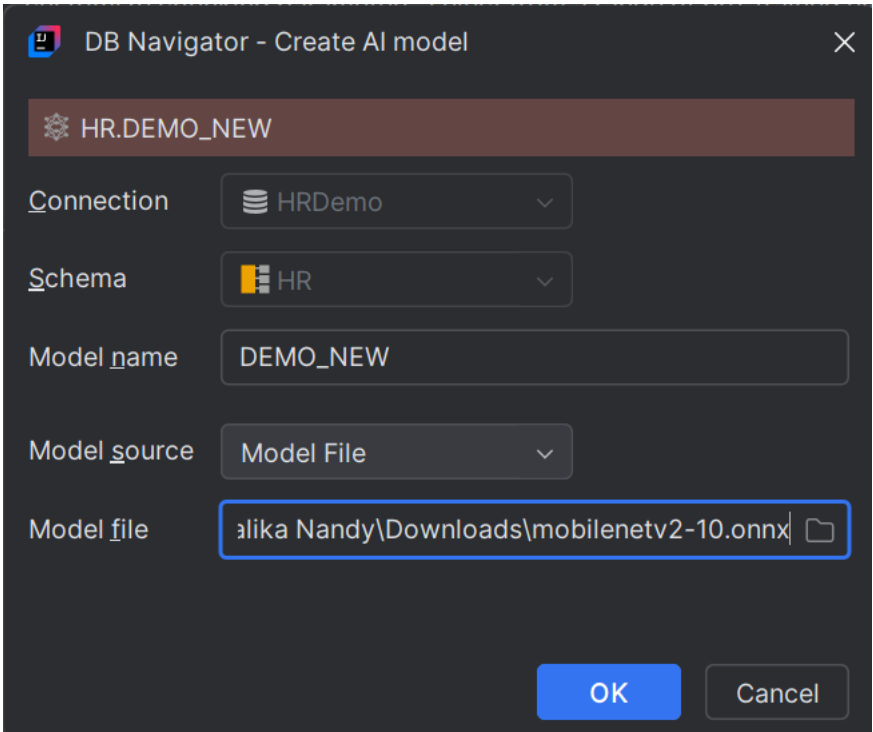
Reset

Close

If an embedding model does not exist, you can create a new model by clicking the **Create AI Model (+)** icon next to the **Model** field. The **DB Navigator - Create AI Model** dialog box opens.

User's Guide
G40038-01
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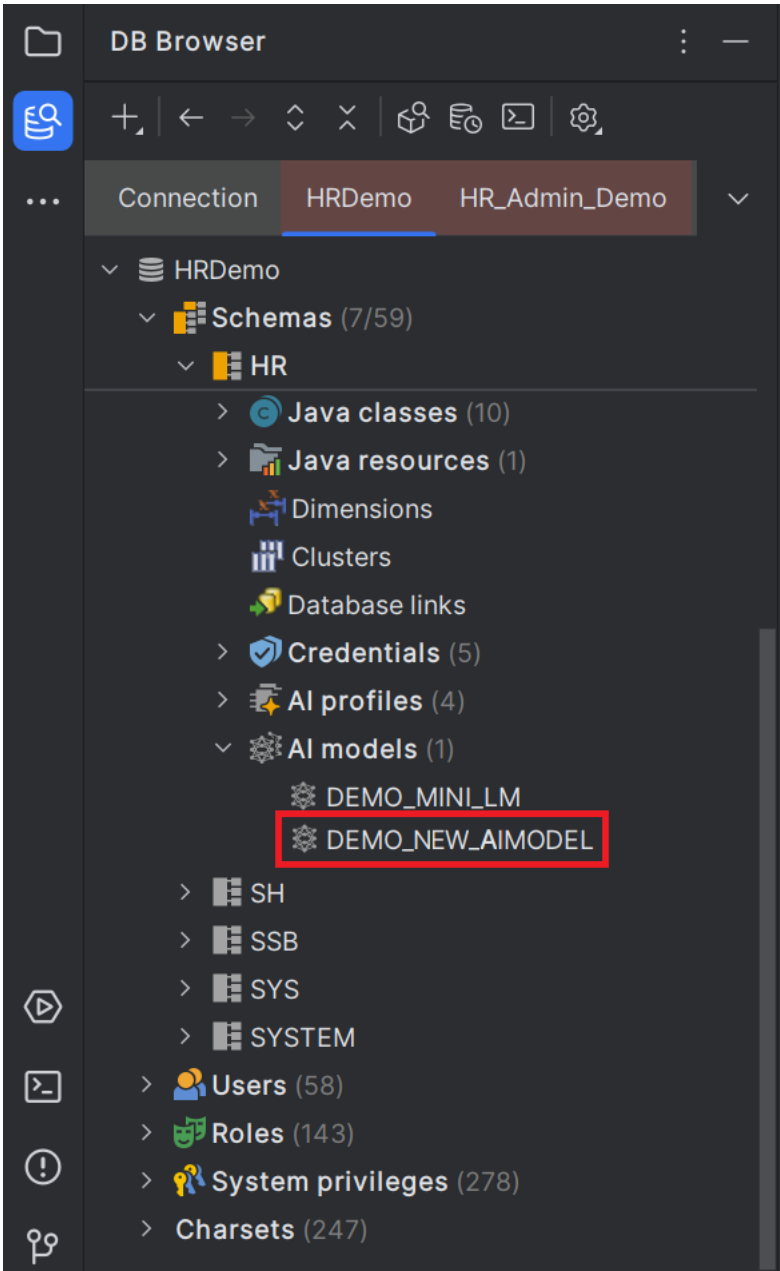
December 5, 2025
Page 12 of 24



Provide the following information to add a new embedding model to use for vector generation:

Field	Description
Connection	This field is pre-filled with the DB connection in which you are adding the AI model.
Schema	This field is pre-filled with the DB schema in which you are adding the AI model.
Model Name	Enter a name for the new AI model.
Model Source	Choose between Model File or Object Resource : Model File - Lets you upload the model source file into the schema. Object Resource - Lets you enter the URL of the embedding model provider's web platform from where the model will be accessed and used along with a Credential corresponding to the model used.
Model File	Browse through the model source file (such as a .onnx file) saved in your local system and upload it. This field is displayed only if you select Model File as the model source.
Object URL	Type the URL of the platform from where the embedding model can be downloaded. This field is displayed only if you select Object Resource as the model source.
Credential	Select one from the available credentials for supported LLMs. If a credential is not available, click the Create Credential icon (+) to open the DB Navigator - Create Credential dialog box and create a new credential corresponding to an LLM (such as those provided by OCI Generative AI, Open AI, Google, Anthropic, Mistral AI, etc.). For more information on creating credentials, see " Creating Credentials for Public LLMs "

Click **OK** to start AI model creation. The model is added to the selected schema and visible on the DB Browser connection tree.



For **Third-party Model**, provide the following information:

Field	Description
Provider	Select from one of the supported third-party AI embedding model providers. Options include: • OCI Generative AI • Open AI • Cohere • Google • Anthropic • Hugging Face • Mistral AI • Vertex AI

Field	Description
Model	Mention the embedding model to be used, for example, Gemini Embedding-001, or text-embedding-3-small.
URL	Provide the URL of the platform from where the third-party embedding model file can be accessed or downloaded/subscribed.
Credential Schema	Select the database schema where the AI credential corresponding to the selected Model (or Model provider) is stored.
Credential	Select one from the list of available credentials that can be used with the selected Model.

DB Navigator - Vector Toolbox

HR_Demo

Vector Chain Embeddings Configuration

Use this interface to generate dense vector representations of your data using Oracle DBMS_VECTOR_CHAIN. Choose data from existing tables or upload file contents, customize chunking parameters, select from a range of pre-trained embedding models hosted in the database or configure third-party alternatives, and decide whether to store generated embeddings in an existing table or create a new one.

These embeddings can be used to power Retrieval-Augmented Generation (RAG) workflows, among other applications.

Powered by [Oracle AI Vector Search](#)

> Chunk Configuration (WORDS / NEWLINE / 100 / 10)

< Embedding Model

Model location: Third-party model

Provider: Open AI

Model: text-embedding-3-small

Url: [orm.openai.com/docs/models/text-embedding-3-small](https://openai.com/docs/models/text-embedding-3-small)

Credential schema: HR

Credential: OPENAI

> Embedding Destination (New table - SH.NEWVECTOR)

Create Embeddings

Reset

Close

To set the destination where you want the generated embeddings to get stored, in the **Embedding Destination** section of the **DB Navigator - Vector Toolbox**, first select the **Destination**. You can either store the generated vector embeddings in an existing database table or create a new table.

If you select **Existing table** as your preferred **Destination**, set the following parameters:

Field	Description
Schema	Select the database schema where the vector embeddings will be stored.
Table	Select the database table within the schema where the vector embeddings will be stored.
Data column	Select the table column to store the embedding text data.
Embedding column	Select the table column to store the embedding vector.
Metadata column	Select the table column to store embedding metadata. Metadata is stored only for file systems and not when the source data is from DB tables.

DB Navigator - Vector Toolbox

HR_Admin_Demo

Vector Chain Embeddings Configuration

Use this interface to generate dense vector representations of your data using Oracle DBMS_VECTOR_CHAIN. Choose data from existing tables or upload file contents, customize chunking parameters, select from a range of pre-trained embedding models hosted in the database or configure third-party alternatives, and decide whether to store generated embeddings in an existing table or create a new one.

These embeddings can be used to power Retrieval-Augmented Generation (RAG) workflows, among other applications.

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> Chunk Configuration (WORDS / NEWLINE / 100 / 10)

> Embedding Model (In-database model)

> Embedding Destination

DestinationExisting table

SchemaADMIN

TableVECTOR_EMBEDDINGS

Data columnTEXT

Embedding columnEMBEDDING

Metadata columnMETADATA

Create Embeddings

Reset

Close

If you select **New table** as your preferred **Destination**, set the following parameters:

Field	Description
Schema	Select the database schema where the vector embeddings will be stored.
Table name	Select the database table within the schema where the vector embeddings will be stored.
Key column	By default, the Key column name is ID. You can change the Key column name where the vector ID is stored.
Text column (CLOB)	Mention the column name to store embedding text data.

Field	Description
Vector column (VECTOR)	Mention the column name to store the embedding vector.
Metadata column (JSON)	Mention the column name to store embedding metadata.

 DB Navigator - Vector Toolbox

 HR_Admin_Demo

Vector Chain Embeddings Configuration

Use this interface to generate dense vector representations of your data using Oracle DBMS_VECTOR_CHAIN. Choose data from existing tables or upload file contents, customize chunking parameters, select from a range of pre-trained embedding models hosted in the database or configure third-party alternatives, and decide whether to store generated embeddings in an existing table or create a new one.

These embeddings can be used to power Retrieval-Augmented Generation (RAG) workflows, among other applications.

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Embedding Model (in database model)

Embedding Destination

Destination: New table

Schema: SH

Table name: NEWVECTOR

Key column: ID

Text column: DATA CLOB

Vector column: EM_VECTOR VECTOR

Metadata column: METADATA JSON

Create Embeddings Reset Close

Once you have configured all the fields for **Data Source**, **Chunk Configuration**, **Embedding Model**, and **Embedding Destination** in the **Vector Toolbox**, click **Create Embeddings** to

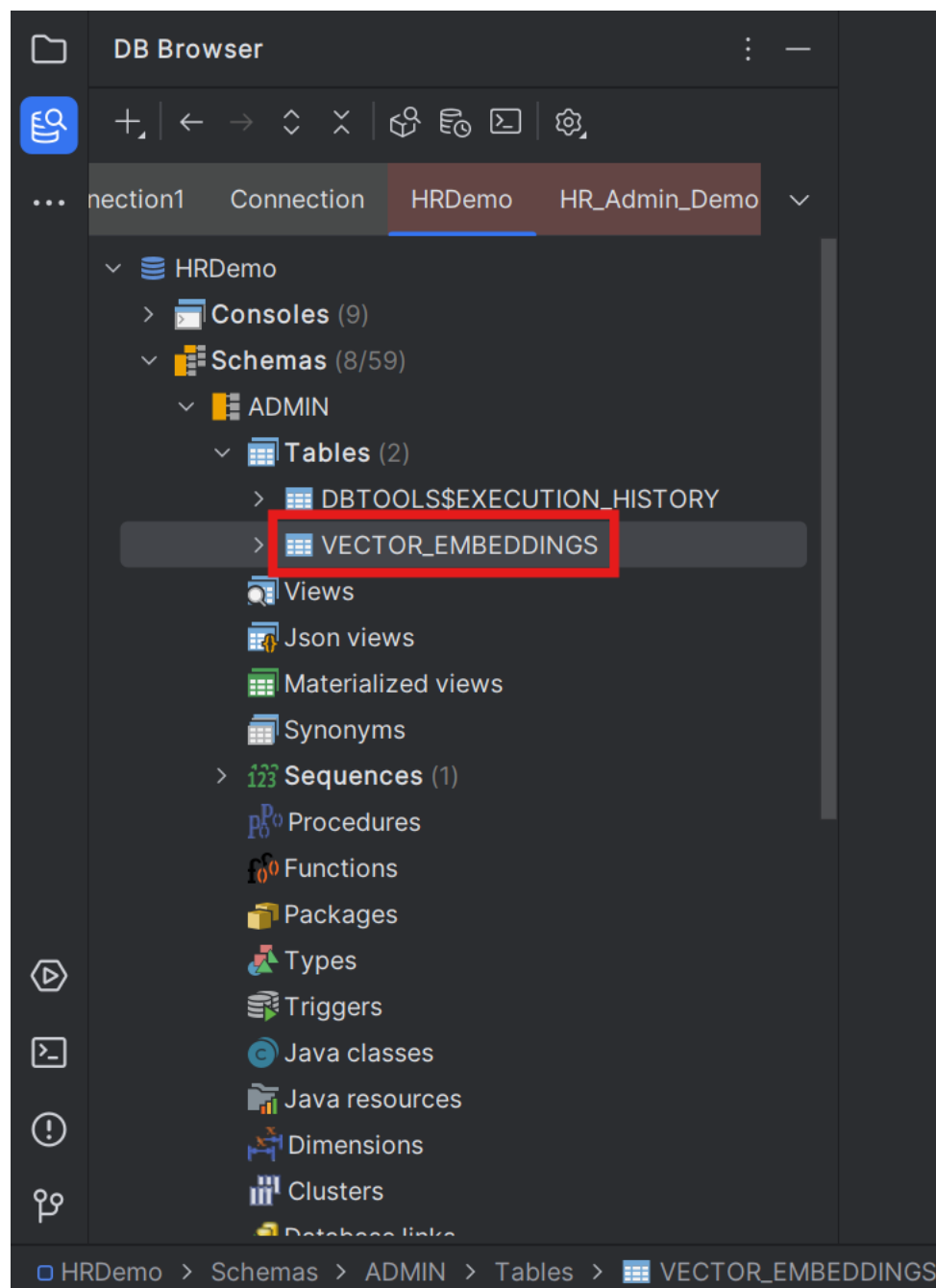
start generating vector embeddings. After successful generation, the vector embeddings get stored in the destination table you configured.

Vector Database Tables

This topic provides an overview of vector embeddings stored in database tables.

Files uploaded as **Data Source** in the **Vector Toolbox** are first staged in a dedicated database file after which the **Chunking Configurations** are applied to the uploaded data. The chunked data is then processed using the set **Embedding Model** to generate the vector embeddings. Generated vector embeddings are stored in the database table as set in the **Embedding Destination** section.

You can access the table where the embeddings are stored, from the DB Browser window.



Open the table in Table Editor to view the generated Vector Embeddings.

	ID	TEXT	EMBEDDING	METADATA
1	43523F1B3C308034E063645D000AC078	[CLOB]	[0.01866072416305542, 0.06770756840705872, -0.0...	
2	43523F1B3C318034E063645D000AC078	[CLOB]	[0.03568015620112419, -0.07614385336637497, -0.0...	
3	43523F1B3C328034E063645D000AC078	[CLOB]	[0.03568015620112419, -0.07614385336637497, -0.0...	
4	43523F1B3C338034E063645D000AC078	[CLOB]	[0.06407530605792999, -0.0492713525891304, -0.0...	
5	43523F1B3C408034E063645D000AC078	[CLOB]	[0.05103650316596031, 0.049992356449365616, -0.0...	
6	43523F1B3C418034E063645D000AC078	[CLOB]	[0.06153477355837822, 0.02089027501642704, -0.0...	
7	43523F1B3C428034E063645D000AC078	[CLOB]	[0.01541125774383545, -0.004965834319591522, 0.0...	
8	43523F1B3C438034E063645D000AC078	[CLOB]	[0.03531184419989586, 0.03255177661776543, -0.0...	
9	43523F1B3C1C8034E063645D000AC078	[CLOB]	[0.07621528953313828, 0.004982287529855967, 0.0...	
10	43523F1B3C1D8034E063645D000AC078	[CLOB]	[0.06283516436815262, -0.012620877474546432, 0.0...	
11	43523F1B3C1E8034E063645D000AC078	[CLOB]	[0.07802656292915344, 0.020315183326601982, 0.0...	
12	43523F1B3C1F8034E063645D000AC078	[CLOB]	[-0.01019696332514286, -0.013097685761749744, -0.0...	
13	43523F1B3C208034E063645D000AC078	[CLOB]	[-0.0051135048270225525, 0.06175275519490242, -0.0...	
14	43523F1B3C218034E063645D000AC078	[CLOB]	[-0.01991613395512104, 0.0387270525097847, -0.07...	
15	43523F1B3C228034E063645D000AC078	[CLOB]	[-0.036303821951150894, -0.022809898480772972, 0.0...	
16	43523F1B3C238034E063645D000AC078	[CLOB]	[-0.04430767148733139, 0.007925956510007381, -0.0...	
17	43523F1B3C188034E063645D000AC078	[CLOB]	[0.01977726382017136, 0.017154209315776825, -0.0...	
18	43523F1B3C198034E063645D000AC078	[CLOB]	[0.03899446874856949, -0.0022964414674788713, 0.0...	
19	43523F1B3C1A8034E063645D000AC078	[CLOB]	[0.04888087883591652, 0.026929164305329323, -0.0...	
20	43523F1B3C1B8034E063645D000AC078	[CLOB]	[0.0737193152308464, -0.016752105206251144, 0.0...	
21	43523F1B3C108034E063645D000AC078	[CLOB]	[0.02545998990535736, 0.12362378090620041, 0.0...	
22	43523F1B3C118034E063645D000AC078	[CLOB]	[0.025809839367866516, 0.11205974221229553, 0.0...	
23	43523F1B3C128034E063645D000AC078	[CLOB]	[0.09457839280366898, -0.014359232038259506, -0.0...	
24	43523F1B3C138034E063645D000AC078	[CLOB]	[-0.08043181896209717, -0.026034435257315636, 0.0...	

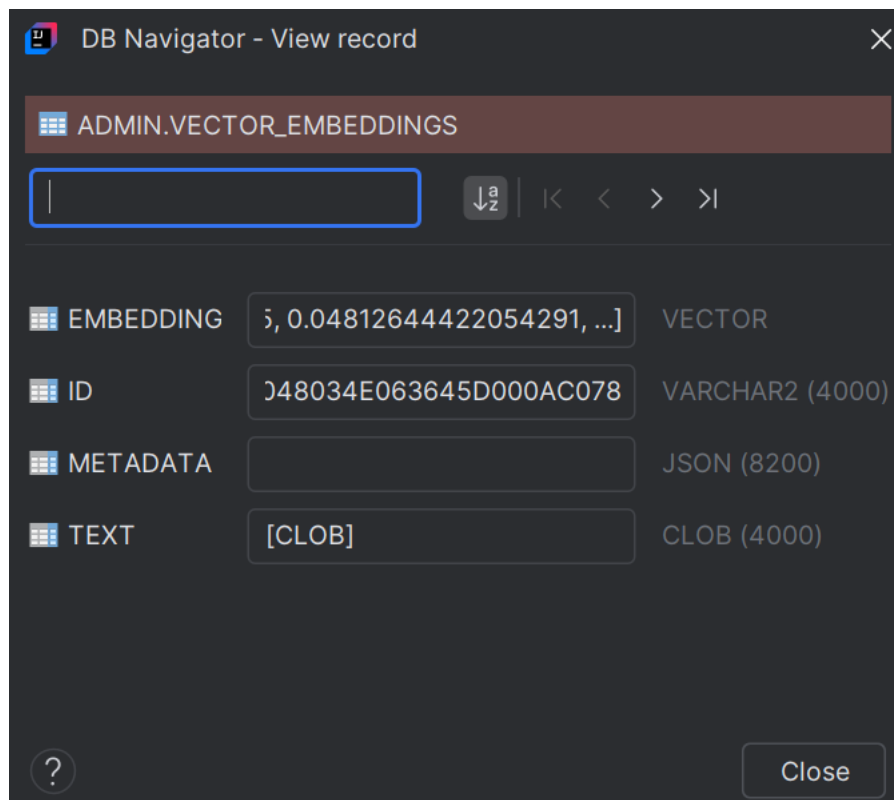
Following columns are created by default for the vector embeddings:

Note

The column names can be customized from **Vector Toolbox > Embedding Destination** configuration.

Column	Description
ID	Contains the unique IDs corresponding to each vector embedding.
TEXT	Contains the chunks of raw data corresponding to the converted vector embedding.
EMBEDDING	Contains the converted vector embeddings of the source data as vector data type. Clicking any of the embedding prompts you to open the embedding in a separate editor window.
METADATA	Contains the metadata associated with the source data. Metadata information is available only when the source data is an external file and not when the source data is from database table.

Clicking a record in any of the columns prompts you to open that record in a separate editor window. Double-clicking a record opens the **DB Navigator - View Record** dialog box with column details of the table (such as column names, column values, and column data type). You can navigate through the table records or filter and search for specific records from this dialog box.

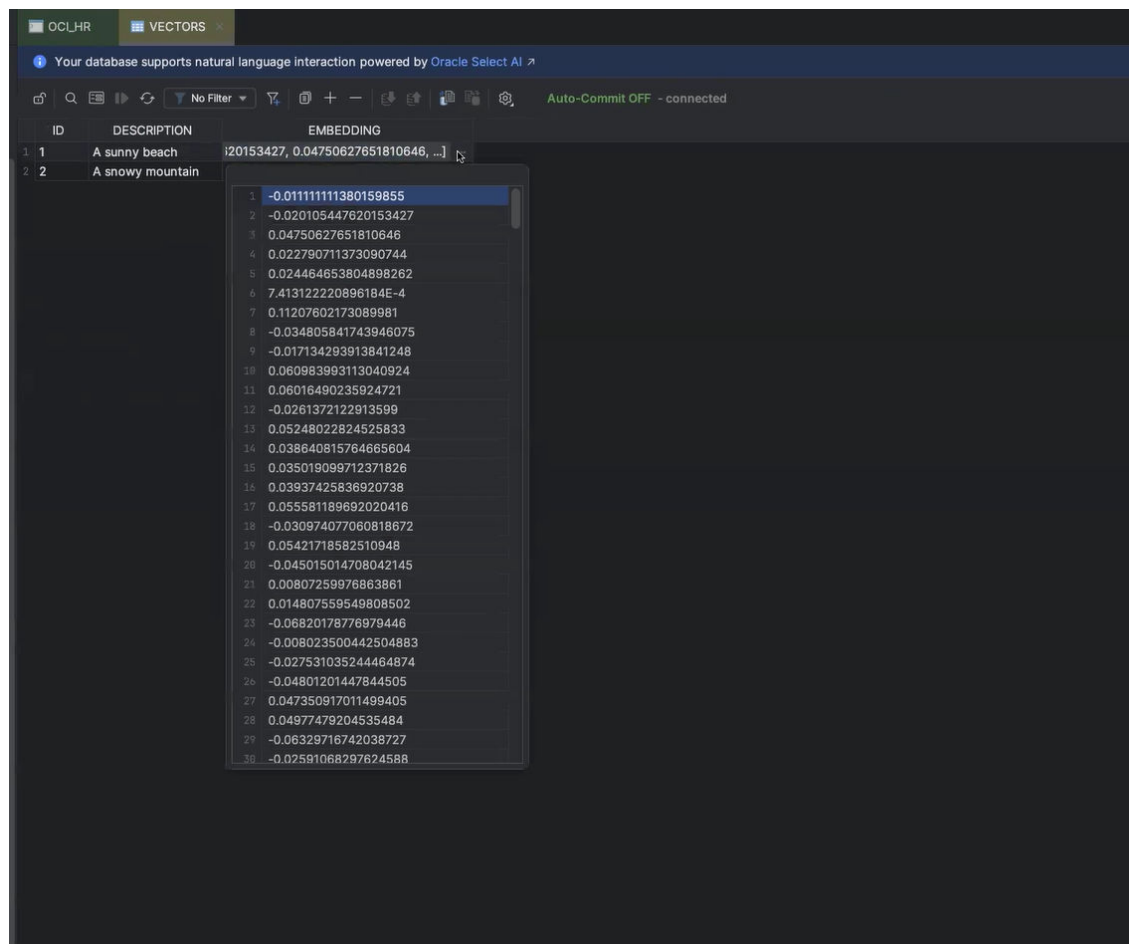


- [Vector Data Type Support](#)
This topic provides an overview of Vector data types supported in Oracle® Database Navigator.

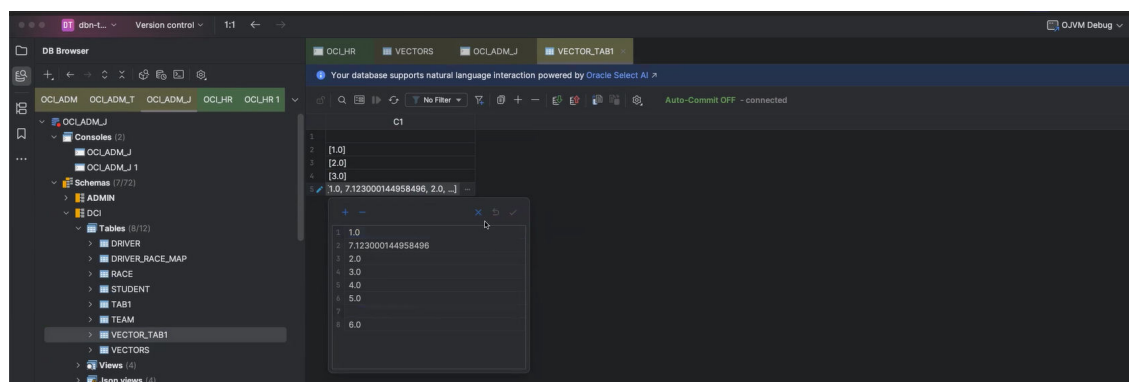
Vector Data Type Support

This topic provides an overview of Vector data types supported in Oracle® Database Navigator.

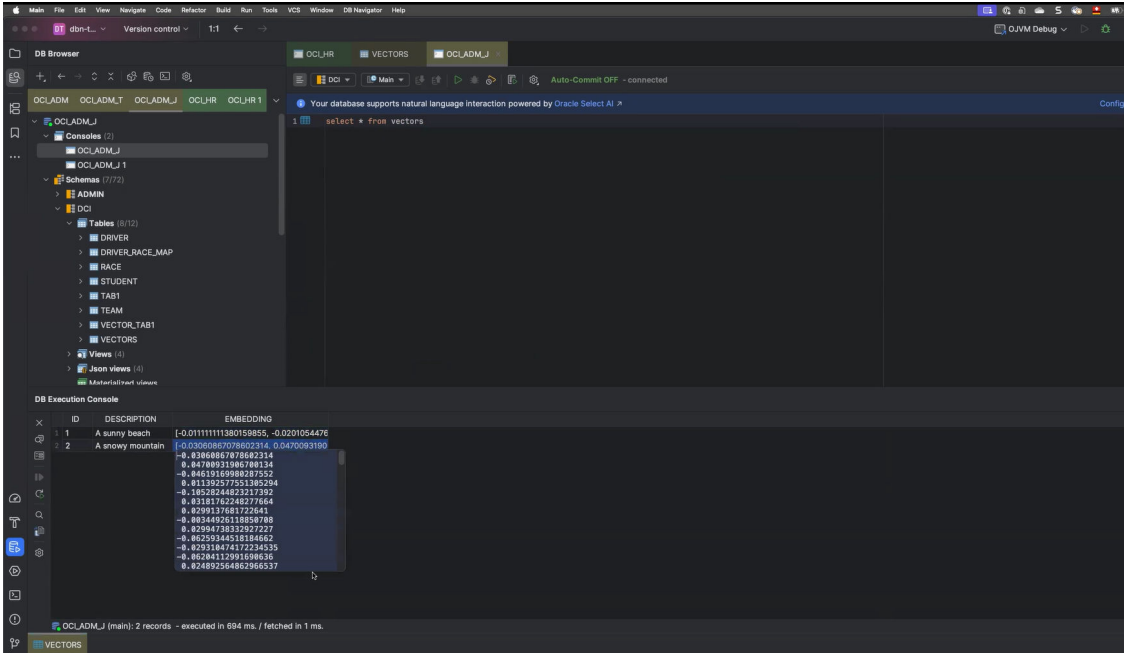
Creating and editing Vector data types in Oracle databases is supported in the Database Navigator plug-in. If any of the database tables contain Vector data type, you will be able to view the array of vector embeddings for a record. Clicking the ellipsis (...) icon next to the vector cell when viewed in the Table Editor displays the cell values (vector data) in an expandable tray (Vector Editor).



You cannot modify non-editable vector embeddings (which have a fixed character size) in the vector editor tray. However, table data with editable vector embeddings can be edited by using the **Edit Record** icon from the Table Editor toolbar menu to make changes. Clicking the ellipsis (...) icon next to an editable vector data cell also opens the cell values in an expandable tray where you can edit the array. You can insert rows of vector data to the cell, remove vector data, or edit any existing array value, and save the changes to the table cell.



You execute a SQL statement involving tables with vector data type and view the query result in the DB Execution Console. You cannot make edits to any of the vector value in the DB Execution Console tab.



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This is a Java port of Daniel Lemire's fast_float project.
This project provides parsers for double, float, BigDecimal and BigInteger values.

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org.apache.httpcomponents.client5:httpclient5:5.1.3
org.apache.httpcomponents.client5:httpcore5:5.1.3
org.apache.httpcomponents.client5:httpcore5-h2:5.1.3
org.apache.logging.log4j:log4j-api:2.24.2
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----- Separator -----

langchain4j 1.4.0

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