

Oracle® Cloud

Create a Decision Model for Your Business Process



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Oracle Cloud Create a Decision Model for Your Business Process,

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Chapter 1

Create a Simple Application

First, let's create an application for the decision. Its process starts with a web form, which has two input fields where you enter temperature and rain forecast numbers. It then uses a decision element to call the decision service. Lastly, a human task element displays the decision result, which tells you what to bring for the day based on the weather.

1. Create an application.

Click **Processes** and then click **Process Applications** to go to the Process Applications page, and then click **Create**.

Click **Create an Application**. Enter a name (What To Bring) and click **Create**.

2. Create a process.

In the Create a Process pane, click **Start with a form**, enter a process name (Decision Process), and click **Create**.

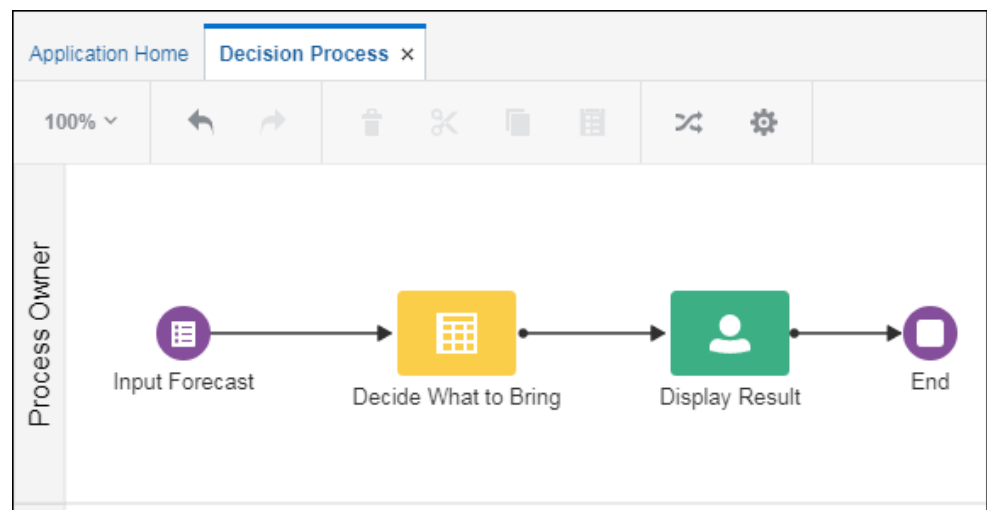
3. Add a decision and human task.

On the Decision Process tab, expand **System** on the Elements palette, drag a **Decision** element to the process, and drop it after the start event.

Expand **Human** on the palette, drag a **Submit** element to the process, and drop it after the decision element.

4. Rename the flow elements.

Double-click the flow elements and rename the start event to Input Forecast, the decision to Decide What to Bring, and the human task to Display Result.



5. Add a web form.

Select the **Input Forecast** element, click **Menu** , and select **Open Properties**. In the **Title** field, enter a name (Forecast) to display for the application.

Click **Create New Form**  next to the **Form** field. Enter InputForecastWebForm in the **Name** field, select the **Open Immediately** check box, and click **Create**.

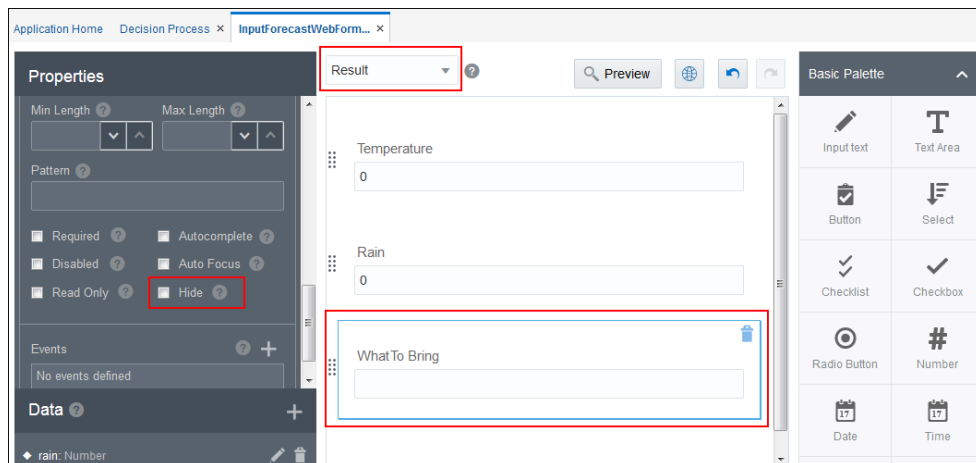
6. Add the forecast input fields to the web form.

From the Basic palette, drag and drop two **Number** controls and one **Input Text** control onto the canvas. Select each control and edit its **Label** field in the Properties pane, changing the number controls to Temperature and Rain, and the text control to What To Bring.

Select the **What To Bring** control, scroll down the General tab, and select the **Hide** check box. Notice that the control becomes dimmed to indicate it's hidden.

7. Add a presentation to display results.

Click the form outside a control. On the Form tab, click **Add Presentation**  next to **Presentations**. In the Select Presentation Type dialog box, select **Clone**. In the Create Presentation dialog box, select **Main** in the **Select from Previous Presentation** field, enter a name for the new presentation (Result), and click **Create**. On the new Result presentation, select the **What To Bring** control and deselect the **Hide** check box.



8. Save the application.
9. Return to the process by clicking the **Decision Process** tab. Open the properties for the **Display Result** human task. Click **Browse**  next to the **Form** field and select **InputForecastWebForm**. In the **Presentation** field, select **Result**.

Create a Decision Model

A decision model does what its name implies: it lets you define how decisions will work. It contains a list of decisions, input data, and other definitions.

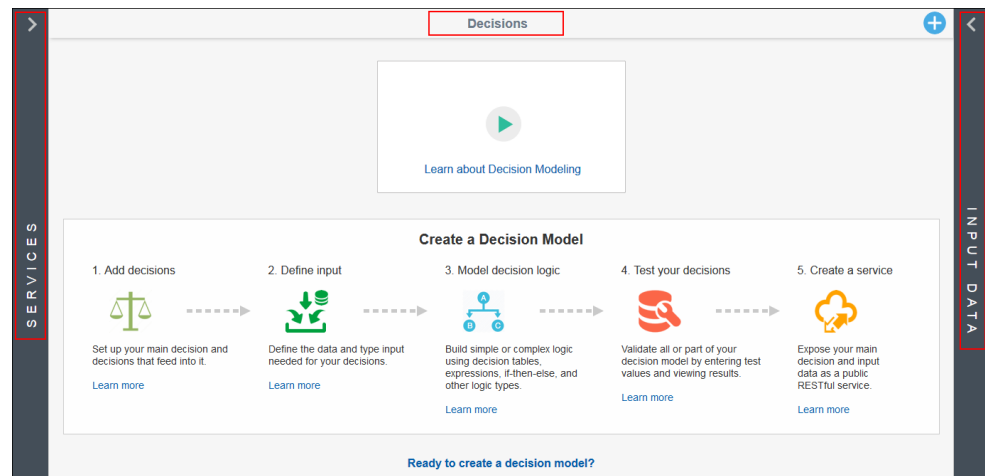
To create a decision model:

1. Return to the Process Applications page by clicking **Back**  on the navigation pane.
2. On the navigation pane, click **Decision Models**.

You can use a decision model in multiple applications.

3. Click **Create**.
4. Click **Create a Decision Model**.
5. In the Create Decision Model dialog box, enter a name for the model (What To Bring Decision Model) and click **Create**.

The decision model editor opens in a new page named with the title you entered. Notice that the editor contains a central pane labeled Decisions on which you construct decisions, with expandable Services and Input Data side panes.



Add Decisions

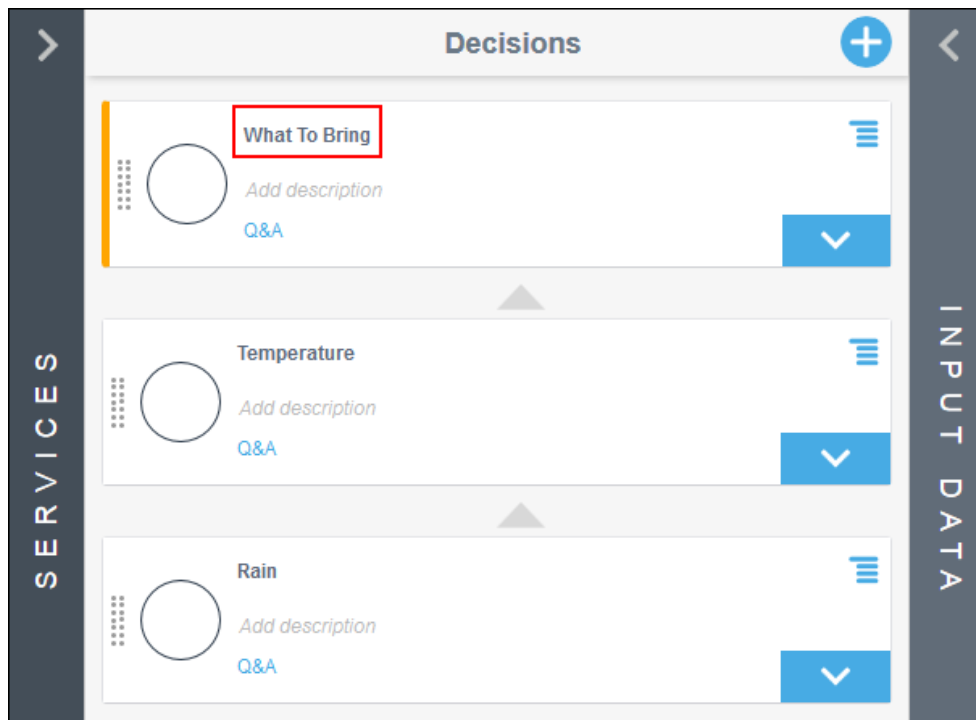
Let's set up our decision model framework. In Decision Model and Notation (DMN), a decision model answers a central question. This model answers the question: what to bring to be prepared for the weather?

1. Add a result decision.
 - a. Click **Add new decision**  in the Decisions bar.
 - b. In the Create Decision dialog box, enter a decision name (What To Bring), select **Empty Logic**, and click **Create**. The new decision displays in the Decisions pane. You can change its logic type later.

2. Create two more decisions to act as supporting decisions.

Most decisions models include supporting decisions that feed into the result decision. Deciding what to bring requires supporting decisions to answer these questions: 1) Will it be warm or cold? 2) Will it rain?

- a. Click **Add new decision**  to create another decision. Enter a decision name (Temperature), select **Empty Logic**, and click **Create**.
- b. Repeat to create another empty logic decision called **Rain**.



Notice that the topmost decision is the **main result** decision. **Supporting** decisions are listed below the main result decision. Decision order is important.

- Decision logic can reference the result of supporting decisions by name. For example, the decision table for **What To Bring** can reference the result of supporting decisions **Rain** and **Temperature** by name.
- Supporting decisions must always be beneath the decisions that reference them. Decision logic can't "see" the decisions listed above. To change the order of decisions in the model, drag the decision by its dotted handle and drop it at the desired position so that supporting decisions are always beneath the decisions that they support.

Define Input

It's hard to make a good decision without input (or data). For our "What to Bring for the Weather" example, the input will be two numbers: temperature and rain percent forecasts. Let's set up their definitions.

1. Click **Show data panel**  to expand the Input Data pane.
2. Add a complex type definition for the forecasts.
 - a. In the Type Definition section, click **Add new item definition** .
 - b. In the **Name** field, enter ForecastType.
 - c. In the **Mode** field, select **Complex**.
 - d. Click **Add Component** next to **Define Type Attributes** to add two attributes.
 - e. For the first attribute, enter Temperature for its name and select **Number** as its mode. Click **Close** to return to the Add Type Definition panel.
 - f. For the second attribute, enter Precipitation for its name and **Number** as its mode.

- g. Click **Close**.

Add Type Definition [X]

Name

ForecastType

Mode

Complex

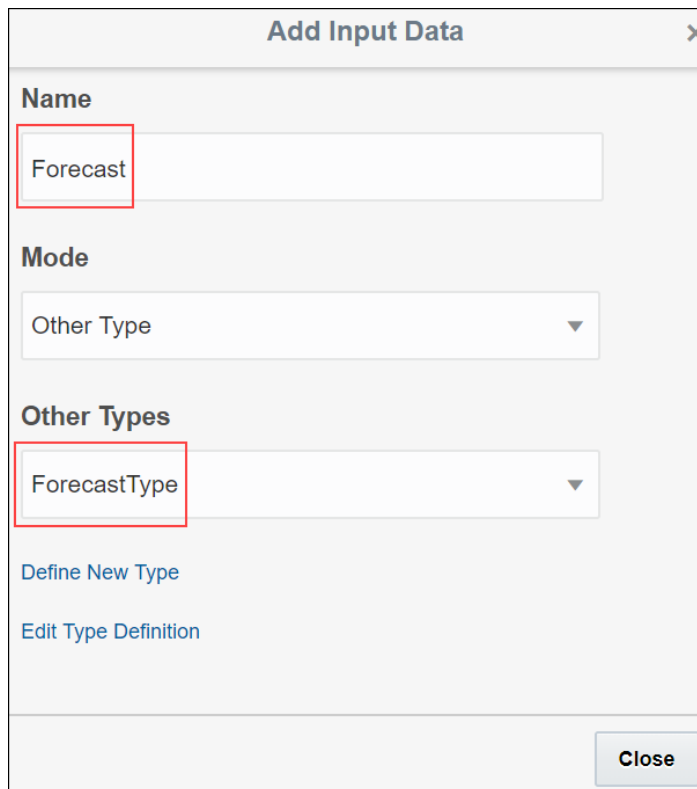
☐ is List ?

Define Type Attributes [Add] [Edit] [Delete]

Name	Type	Value/Values	is List
Temperature	Number	Number	false
Precipitation	Number	Number	false

Close

3. Add an input variable that uses the Forecast type definition you just created.
- In the Input Data section, click **Add new input data** [Add].
 - In the **Name** field, enter Forecast.
 - In the **Mode** field, select **Other Type**.
 - In the **Other Types** field, select **ForecastType** and click **Close**.



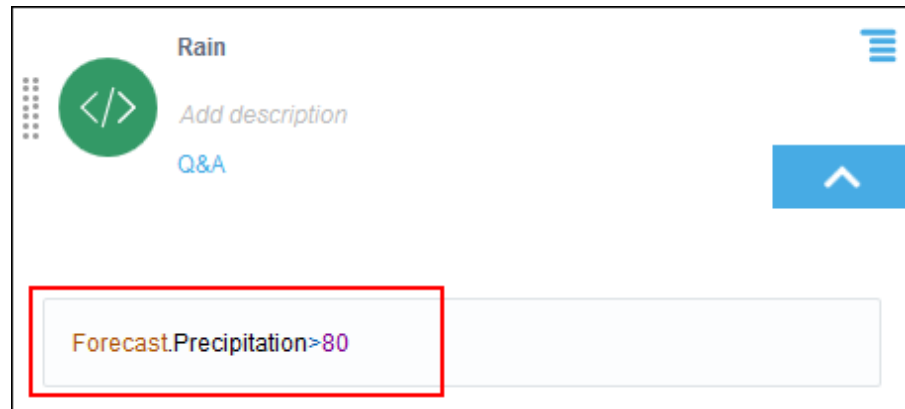
4. Click **Hide data panel**  to collapse the Input Data pane.

Model Decision Logic

Now let's change the empty logic of the decisions. You can configure decision logic in a variety of ways, but here you'll create a Boolean expression, an if-then-else expression, and a decision table.

1. Configure a Boolean expression for the rain forecast.
 - a. Change the **Rain** decision to an Expression decision. Select the **Expression** logic from the list that is displayed within the decision.

Notice that the decision's icon changed to an expression icon and the decision expanded. Also, a number and a yellow circle with an exclamation point ¹  indicate a validation error because you haven't entered an expression yet.
 - b. Enter the expression using the input data you already defined. Click the **Enter expression** field and enter this condition:
`Forecast.Precipitation>80`



When the precipitation input value is greater than 80 percent, this Boolean expression will be true (rain is likely); otherwise it will be false (rain is unlikely).

- c. Click **Collapse**  to collapse the Boolean expression. Notice that the validation error no longer displays because the expression is now valid.
2. Configure an if-then-else decision for the temperature forecast.
 - a. Expand the **Temperature** decision and change its type to **If-Then-Else**. The decision expands and shows validation errors for items you need to complete.
 - b. Complete the decision's **if**, **then**, and **else** expression fields as follows:
 - **if:** `Forecast.Temperature>65`
 - **then:** `"warm"`
 - **else:** `"cold"`

Because "warm" and "cold" values are strings, you must include quotation marks around the values. (Depending on your location, you may want to adjust the temperature condition of **>65** from degrees in Fahrenheit to **>18** in Celsius.)

Temperature

Add description

Q&A

if

Forecast.Temperature > 65

then

"warm"

else

"cold"

- c. Collapse the decision and verify that the validation errors no longer display.
3. Configure a decision table for the **What To Bring** decision.

A decision table lets you model input, output, and rules in a compact way. It derives a final output decision using input data and the results of other decisions.

In the example, the temperature and rain input decisions each have two possibilities, resulting in a total of four output possibilities.

Temperature (input)	Rain (input)	What To Bring (output)
warm	true	umbrella
cold	true	raincoat
cold	false	overcoat
warm	false	nothing

- a. Expand the **What To Bring** decision and change its type to **Decision Table**.
- b. Expand the decision and explore the table started for you.
 - The yellow column is for **output**, and is always the final column of the table. **What To Bring** is already designated as your output decision.
 - The adjacent grey column is for **input**. You'll add a second input column, using one of the controls located above the output column.
 - Rows are for **rules**. A row labeled **1** is already listed.
 - Above the 1 in rule 1 is a **U**, indicating that the table uses a unique hit policy. The hit policy determines the output of a decision table when more than one rule matches the input data.
- c. Configure the possible values for the **What To Bring** output column.

- In the **What To Bring** column, click **Enter Allowed Values**.
- In the resulting dialog, select **Text** in the **Mode** field, select **list of values** in the **Constraints** field, and enter the following values: umbrella, raincoat, overcoat, nothing.
- Click **Close**.

Decision Table Output

Name

Mode

Allowed Values

Values

umbrella
raincoat
overcoat
nothing

- d. Configure the **Temperature** input column.

In the **Enter Expression** cell of the gray input column, press **Ctrl+Space** to open a pop-up menu. Select **Temperature** from the menu. For an input column, the Allowed Value cell is auto-populated based on the input expression.

- e. Add and configure the **Rain** input column.

- Click the **Temperature** input column and select **Add column after** .
- In the **Enter Expression** cell, press **Ctrl+Space** to open a pop-up menu. Select **Rain** from the menu. The Allowed Value cell is auto-populated with Boolean values.

- f. Add and configure rules.

- In row 1, click the cell below **Temperature** and select **warm**.

Notice the  icon in the cell, which stands for text. Clicking this icon, you can toggle between Text , Any, and Advanced  modes for all the cells in this column.

In the text mode, text strings are automatically italicized and quotation marks aren't needed.

- Click the cell below **Rain** and select **true**. Notice the  icon in the cell, which stands for Boolean. Clicking this icon, you can toggle between Boolean , Any, and Advanced  modes for all the cells in this column.
 - Click the cell below **What To Bring** and select **umbrella** from the auto-suggest menu. If needed, set the cell's mode to Text. Quotation marks aren't needed.
- g. Click **Add rule after**  three times to add three rows to the table.
- h. Complete rules 2 through 4 of the decision table:
- For rule 2, select **cold**, **true**, and **raincoat**.
 - For rule 3, select **cold**, **false**, and **overcoat**.
 - For rule 4, select **warm**, **false**, and **nothing**.

Decisions			
What To Bring Add description Q&A			
Decision Table			
U	Temperature warm,cold	Rain true,false	What To Bring umbrella,raincoat,overcoat,nothing
1	warm	true	umbrella
2	cold	true	raincoat
3	cold	false	overcoat
4	warm	false	nothing

- i. Collapse the decision.

Test Your Decisions

Verify that the model produces the results you want by testing it with input values.

- Click **Test** .
- In the Test Decision Model pane, enter values in the **Temperature** and **Precipitation** fields and click **Start Test**. For example, enter 85 into both fields.

The Decision Model Result pane displays decision results. Click each green check mark to see the decision's result.

Go Back
Decision Model Result
x

What To Bring	✓	Results Output is: umbrella
Temperature	✓	
Rain	✓	

- Click **Go Back**, and repeat step 1 and 2 to test each decision rule's outcome.

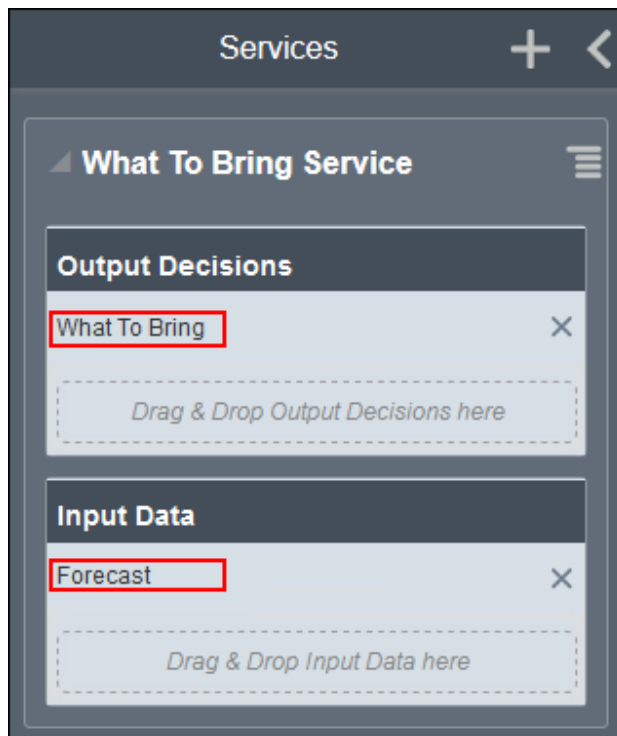
Temperature (F)	Precipitation %	Outcome
85	85	- What to Bring: umbrella - Temperature: warm - Rain: true
50	85	- What to Bring: raincoat - Temperature: cold - Rain: true
50	50	- What to Bring: overcoat - Temperature: cold - Rain: false
85	50	- What to Bring: nothing - Temperature: warm - Rain: false

- Save the decision model.

Create a Service

After you complete and test the decision logic, create a RESTful service to communicate with Process. The decision service specifies the decision and input data you want to expose.

- Expand the Services pane, and click **Add new service** .
- Enter a name for the decision service (What To Bring Service) and click **OK**.
- From the Decisions pane, drag **What To Bring** (the title of your result decision) to the **Output Decisions** field in the Services pane and drop when the field turns blue. The service name displays above the field. Validation errors display because you haven't specified input data yet.
- From the Input Data pane, drag the **Forecast** input data to the **Input Data** field in the Services pane and drop when the field turns blue.



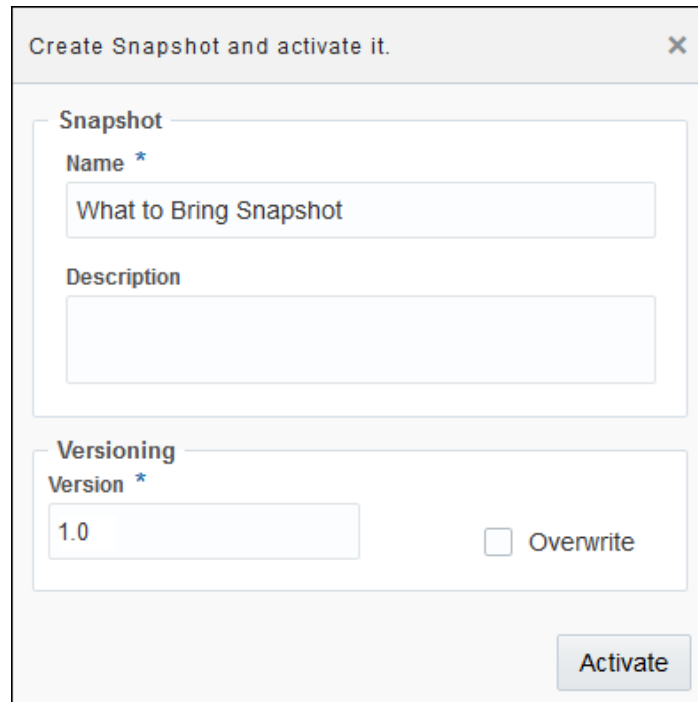
You can output multiple decisions and input multiple data items in a service.

5. Click **Save**.

Activate a Decision Snapshot

To use a decision model, you must create a snapshot of it and activate the snapshot on the DMN server.

1. In the decision model editor toolbar, click **Activate**.
2. In the Create Snapshot and activate it dialog box, enter a name (what to Bring Snapshot) and click **Activate**.

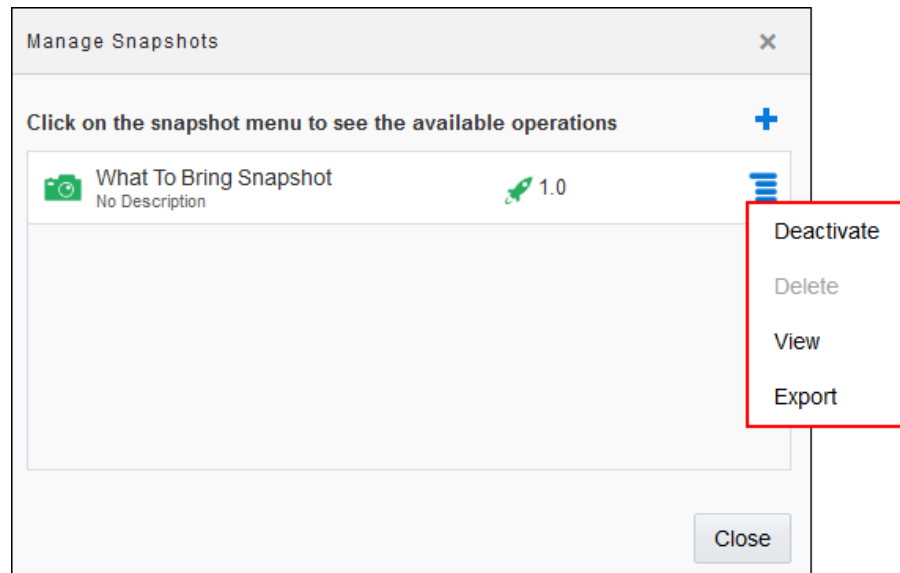


A dialog box titled "Create Snapshot and activate it." with a close button (X) in the top right corner. It contains two sections: "Snapshot" and "Versioning". The "Snapshot" section has a "Name *" field with the text "What to Bring Snapshot" and a "Description" field. The "Versioning" section has a "Version *" field with the text "1.0" and an "Overwrite" checkbox. An "Activate" button is located at the bottom right.

3. In the decision model editor toolbar, click **Snapshots**.

Notice that the snapshot you just activated is listed, along with any other activated snapshots. Here you can:

- Activate or deactivate a selected snapshot.
- Delete a snapshot. You must deactivate a snapshot before you can delete it.
- View a read-only version of the snapshot.
- Export a snapshot, which you can later import into a new decision model and edit its contents.



A dialog box titled "Manage Snapshots" with a close button (X) in the top right corner. It contains a list of snapshots. The first snapshot is "What To Bring Snapshot" with a green icon, "No Description", and a green rocket icon next to "1.0". A menu is open next to this snapshot, showing options: "Deactivate", "Delete", "View", and "Export". A "Close" button is at the bottom right.

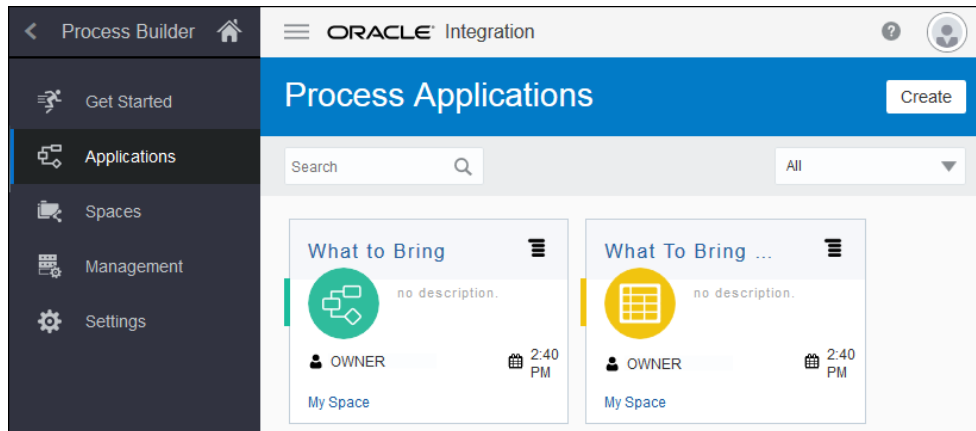
4. Click **Close**.

Use the Decision in Your Application

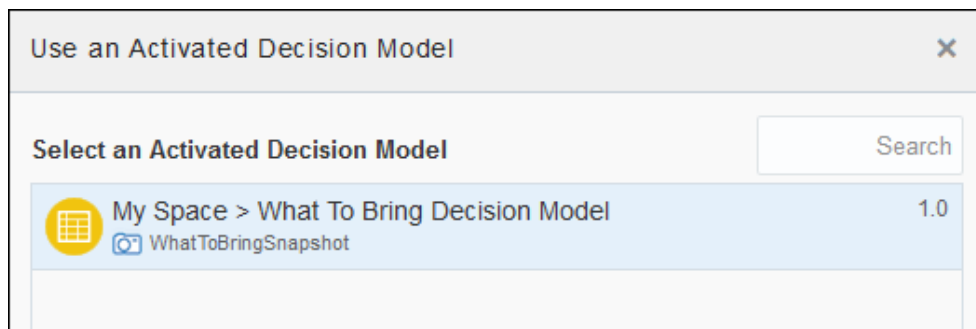
Now let's use your activated decision snapshot in a process within an application.

1. Return to the Process Applications page by clicking **Back**  in the navigation pane.

Notice that the page displays both the application and the decision model you created.

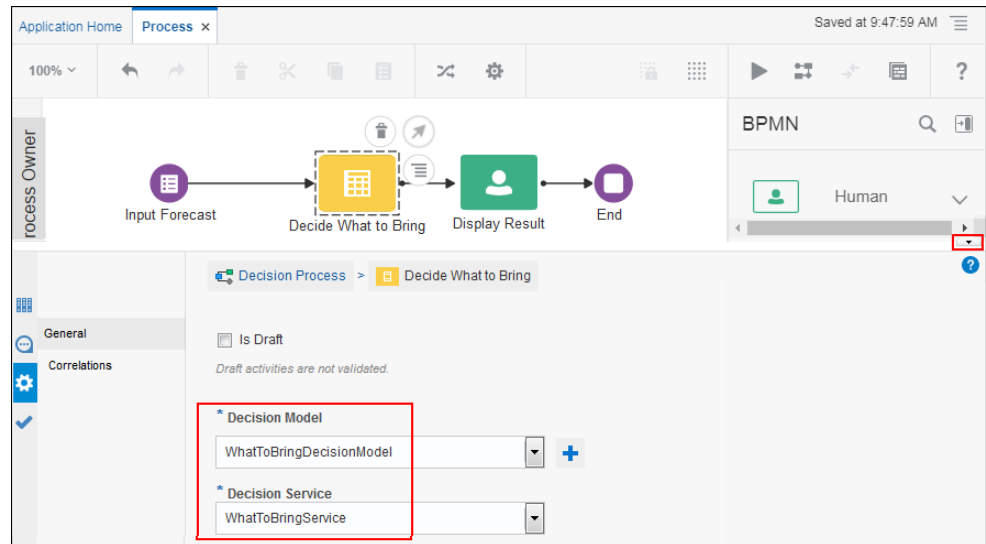


2. Open the **What To Bring** application you created.
3. Open the decision process. Select the decision element you added (Decide What to Bring), click **Menu** , and select **Open Properties**.
4. On the Properties pane, click **Use Decision Model**  next to the **Decision Model** field.
5. In the Use an Activated Decision Model dialog box, select the snapshot you created and activated (whatToBringSnapshot), and click **Use**.



Process brings the activated decision model snapshot into the application and performs behind-the-scenes operations such as importing data types and defining the REST connector to the service.

Notice that the Properties pane now lists the decision model and service you selected to use.

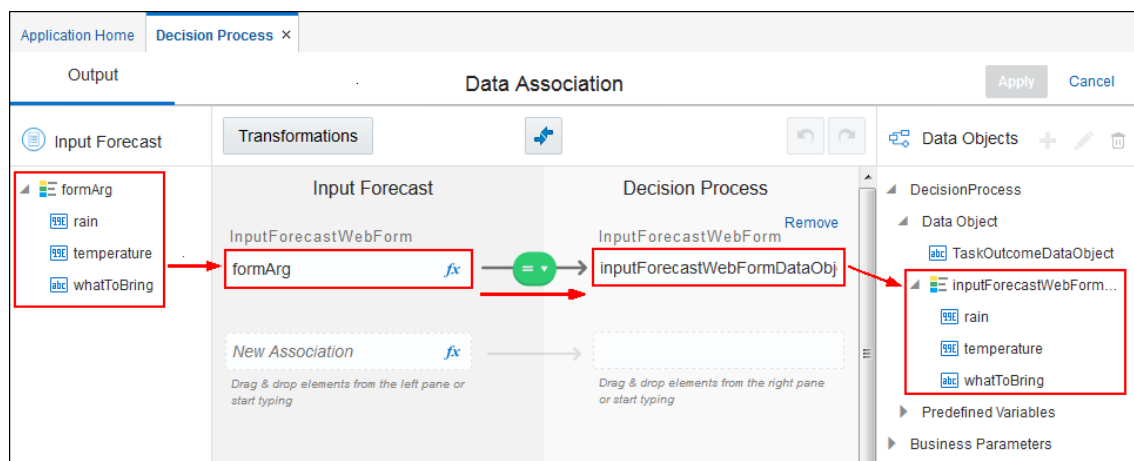


6. Click **Collapse Pane**  to close the properties pane.

Map Data to and from the Decision

Configuring the data mapping is the last key piece in configuring a decision model. The data needs to flow from the web form into the decision and its result must flow out of the decision so the human task can display it.

1. On the Decision Process tab, let's view the data association that was automatically configured for the Input Forecast start activity and the Display Result human task.
 - a. Select the **Input Forecast** element and click **Data Association** in the toolbar. Expand the values in both side panes. Notice that values entered into the web form are written to a data object called **inputForecastWebFormDataObject**. Click **Cancel**.



- b. Select the **Display Result** element and click **Data Association** in the toolbar. Notice that for input, the same data object—**inputForecastWebFormDataObject**—is used to write values back to the web form. Click **Cancel**.
2. Map input and output data association for the decision element.

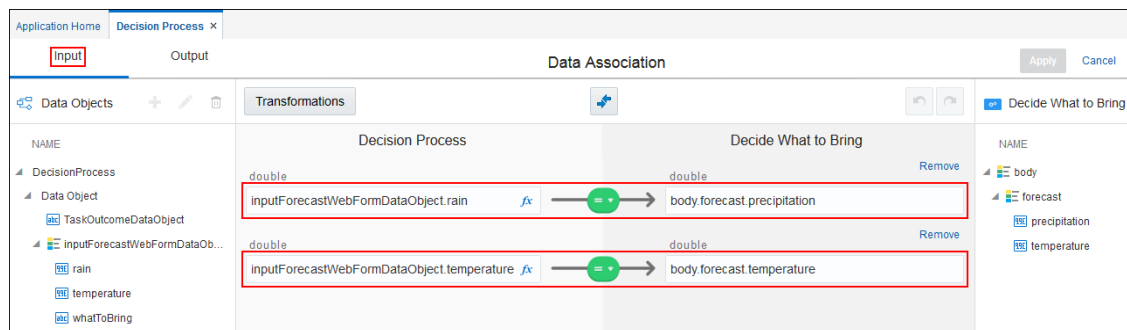
The decision needs to use the input values (rain, temperature) contained in **inputForecastWebFormJsonObject** and output the decision's result (what to bring) into the data object.

- a. Open data association for the **Decide What to Bring** element. With the **Input** tab selected, expand the values in both side panes.

- b. Map the rain and temperature values as follows:

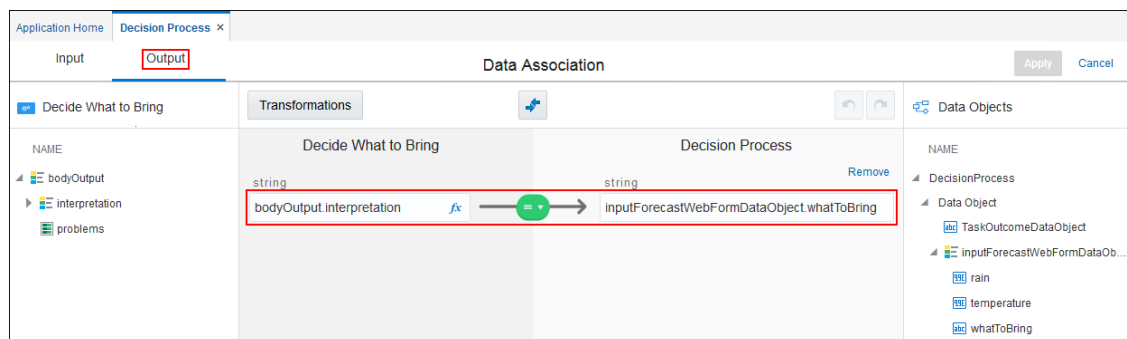
`inputForecastWebFormJsonObject.rain` to `body.forecast.precipitation`

`inputForecastWebFormJsonObject.temperature` to `body.forecast.temperature`



- c. With the **Output** tab selected, map the Decide What to Bring value as follows:

`bodyOutput.interpretation` to `inputForecastWebFormJsonObject.whatToBring`



3. Click **Apply**.

Try Your Decision in Runtime

Let's try running the application in test mode as an end user.

1. From the toolbar, click **Test**.
2. On the Test Application tab, click **Activate**. In the Activate to Test dialog box, leave the **Add Me to All Roles** check box selected and click **Activate**.
3. After the application activates successfully, click **Try in Test Mode**. When the new browser tab opens displaying runtime options, click **Forecast** from the My Apps pane.

4. In the form, enter temperature and rain values, and click **Submit**.
5. Click **My Tasks** and open your new task. The **What To bring** field displays the decision's result based on the values you entered.

The screenshot displays the Oracle Decision Process 'What_To_Bring' in Testing Mode. The interface is divided into a left sidebar and a main right panel. The sidebar contains a task card for 'What_To_Bring' with a red 'DP' icon, 'Process: DecisionProcess', 'From: Admin', and 'Process Id: 7'. The main panel has a header with 'Submit', 'Save', and 'More' buttons. Below the header, there are tabs for 'Comments', 'History', and 'More Information'. The 'Form' section contains three input fields: 'Temperature' with the value '50', 'Rain' with the value '50', and 'What To Bring' with the value 'overcoat'. A red rectangle highlights these three input fields.