

Oracle® Retail Analytical Parameter Calculator

User Guide

Release 13.0.1

August 2008

Copyright © 2008 Oracle. All rights reserved.

Primary Author: Judith Meskill

The Programs (which include both the software and documentation) contain proprietary information; they are provided under a license agreement containing restrictions on use and disclosure and are also protected by copyright, patent, and other intellectual and industrial property laws. Reverse engineering, disassembly, or decompilation of the Programs, except to the extent required to obtain interoperability with other independently created software or as specified by law, is prohibited.

The information contained in this document is subject to change without notice. If you find any problems in the documentation, please report them to us in writing. This document is not warranted to be error-free. Except as may be expressly permitted in your license agreement for these Programs, no part of these Programs may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose.

If the Programs are delivered to the United States Government or anyone licensing or using the Programs on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the Programs, including documentation and technical data, shall be subject to the licensing restrictions set forth in the applicable Oracle license agreement, and, to the extent applicable, the additional rights set forth in FAR 52.227-19, Commercial Computer Software—Restricted Rights (June 1987). Oracle Corporation, 500 Oracle Parkway, Redwood City, CA 94065

The Programs are not intended for use in any nuclear, aviation, mass transit, medical, or other inherently dangerous applications. It shall be the licensee's responsibility to take all appropriate fail-safe, backup, redundancy and other measures to ensure the safe use of such applications if the Programs are used for such purposes, and we disclaim liability for any damages caused by such use of the Programs.

Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

The Programs may provide links to Web sites and access to content, products, and services from third parties. Oracle is not responsible for the availability of, or any content provided on, third-party Web sites. You bear all risks associated with the use of such content. If you choose to purchase any products or services from a third party, the relationship is directly between you and the third party. Oracle is not responsible for: (a) the quality of third-party products or services; or (b) fulfilling any of the terms of the agreement with the third party, including delivery of products or services and warranty obligations related to purchased products or services. Oracle is not responsible for any loss or damage of any sort that you may incur from dealing with any third party.

Value-Added Reseller (VAR) Language

(i) the software component known as **ACUMATE** developed and licensed by Lucent Technologies Inc. of Murray Hill, New Jersey, to Oracle and imbedded in the Oracle Retail Predictive Application Server - Enterprise Engine, Oracle Retail Category Management, Oracle Retail Item Planning, Oracle Retail Merchandise Financial Planning, Oracle Retail Advanced Inventory Planning and Oracle Retail Demand Forecasting applications.

(ii) the **MicroStrategy** Components developed and licensed by MicroStrategy Services Corporation (MicroStrategy) of McLean, Virginia to Oracle and imbedded in the MicroStrategy for Oracle Retail Data Warehouse and MicroStrategy for Oracle Retail Planning & Optimization applications.

(iii) the **SeeBeyond** component developed and licensed by Sun Microsystems, Inc. (Sun) of Santa Clara, California, to Oracle and imbedded in the Oracle Retail Integration Bus application.

(iv) the **Wavelink** component developed and licensed by Wavelink Corporation (Wavelink) of Kirkland, Washington, to Oracle and imbedded in Oracle Retail Store Inventory Management.

(v) the software component known as **Crystal Enterprise Professional and/or Crystal Reports Professional** licensed by Business Objects Software Limited ("Business Objects") and imbedded in Oracle Retail Store Inventory Management.

(vi) the software component known as **Access Via**TM licensed by Access Via of Seattle, Washington, and imbedded in Oracle Retail Signs and Oracle Retail Labels and Tags.

(vii) the software component known as **Adobe Flex**TM licensed by Adobe Systems Incorporated of San Jose, California, and imbedded in Oracle Retail Promotion Planning & Optimization application.

(viii) the software component known as **Style Report**TM developed and licensed by InetSoft Technology Corp. of Piscataway, New Jersey, to Oracle and imbedded in the Oracle Retail Value Chain Collaboration application.

(ix) the software component known as **WebLogic**TM developed and licensed by BEA Systems, Inc. of San Jose, California, to Oracle and imbedded in the Oracle Retail Value Chain Collaboration application.

(x) the software component known as **DataBeacon**TM developed and licensed by Cognos Incorporated of Ottawa, Ontario, Canada, to Oracle and imbedded in the Oracle Retail Value Chain Collaboration application.

Contents

Preface	ix
Audience	ix
Related Documents	ix
Customer Support	ix
Review Patch Documentation	ix
Oracle Retail Documentation on the Oracle Technology Network	x
Conventions	x
1 Getting Started	
APC Data	1-1
User Requirements	1-2
Overview of APC User Interface	1-2
Logging Into APC	1-2
Navigation Within the User Interface	1-2
Common Buttons	1-2
The APC Process	1-3
Changing Parameter Settings	1-4
Dependencies	1-5
2 Preprocessing	
Introduction	2-1
The Preprocessing Interface	2-1
Item Week Filters	2-2
Item Filters	2-2
Preprocessing Results Page	2-4
3 Season Code Setup	
Introduction	3-1
The Season Code Setup Interface	3-1
Item Week Filters	3-2
Start Date Code	3-2
End Buckets	3-3
Adjacent Weeks	3-4
Attribute Mapping	3-4

4	Raw AP	
	Introduction.....	4-1
	The Raw AP Interface.....	4-1
	Selecting Hierarchy Levels.....	4-2
	Seasonality Settings.....	4-2
	Item-Week Filters.....	4-3
	Markdowns.....	4-3
	Partition Filters.....	4-4
	Elasticity Target.....	4-4
5	Smoothing	
	Introduction.....	5-1
	The Smoothing Interface.....	5-1
	Seasonality Correlation Period.....	5-1
6	Pruning	
	Introduction.....	6-1
	The Pruning Interface.....	6-1
	Data Sufficiency.....	6-1
	Item Week Filters.....	6-2
	Year-to-Year Pruning.....	6-3
	Base Historic Period.....	6-3
	Pruning Filtering Results.....	6-4
	Pruning Seasonality Results.....	6-5
7	Event Lift	
	Introduction.....	7-1
	The Event Lift Interface.....	7-1
	Curve Creation.....	7-2
	Events.....	7-3
	Holidays.....	7-3
	Promotions.....	7-4
8	Propagation	
	Introduction.....	8-1
	The Propagation Interface.....	8-1
	Seasonality Coverage.....	8-2
9	Output and Parameter Export	
	Introduction.....	9-1
	The Output Interface.....	9-1
	Item Week Filters.....	9-2
	Escalation Path.....	9-2
	Parameter Export.....	9-3

10 Tools

Introduction.....	10-1
Data Validation	10-2
Stage Status.....	10-3
Custom Run.....	10-4
Parameter Histogram	10-4
Raw Seasonality Viewer	10-6
Output Seasonality Viewer	10-7

Glossary

Preface

The Analytical Parameter Calculator (APC) is an analytical tool used to calculate demand parameters and produce results in a format appropriate for other applications.

Audience

This document is intended for analysts and scientists who will configure and use APC.

Related Documents

For more information, see the following documents in the Oracle Retail Analytical Parameter documentation set:

- *Oracle Retail Analytical Parameter Calculator Installation Guide*
- *Oracle Retail Analytical Parameter Calculator Configuration Guide*
- *Oracle Retail Analytical Parameter Calculator Release Notes*

Customer Support

- <https://metalink.oracle.com>

When contacting Customer Support, please provide:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instruction to recreate
- Exact error message received
- Screen shots of each step you take

Review Patch Documentation

For a base release ("0" release, such as 13.0), Oracle Retail strongly recommends that you read all patch documentation before you begin installation procedures. Patch documentation can contain critical information related to the base release, based on new information and code changes that have been made since the base release.

Oracle Retail Documentation on the Oracle Technology Network

In addition to being packaged with each product release (on the base or patch level), all Oracle Retail documentation is available on the following Web site:

http://www.oracle.com/technology/documentation/oracle_retail.html

Documentation should be available on this Web site within a month after a product release. Note that documentation is always available with the packaged code on the release date.

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.
<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.

Getting Started

The Analytical Parameter Calculator (APC) is an analytical tool used to calculate demand parameters, seasonality and price elasticity, and view the results. These demand parameters are produced in the format required by the analytic application.

This chapter provides a general overview to the features and functionality found in the APC tool. The APC tool is organized into stages. Each stage occupies a separate screen in the UI. Each stage contains parameters that are configurable. The functionality of the UI is the same in each screen. That functionality is described in this chapter. The details of each stage is described in subsequent chapters. A separate chapter is devoted to the Tool Bar, located on the top of each screen.

APC Data

APC requires at least two years of historical data. However, long life cycle customers will need more data. These requirements exist because the data at the beginning and end of the historical period may have to be removed from the data analysis for the following reasons:

- The year-dependent season codes that overlap the first eight weeks (on average) of historical data can, in general, not be used. Year-dependent season codes are used to classify items by their start dates, and a year-dependent season code that overlaps the first eight weeks of historical data generally contains items whose true start date occurred before the start of the historical data.
- The last eight weeks (on average) also cannot be used because the year-dependent season codes may contain items that extend past the end of the historical data

Which season codes cannot be used depends on the length of the life cycles of the items in the data.

Seasonality correlation determines which seasonality curves are reliable by comparing a season code to another season code one year earlier or one year later. Because of this, the process requires at least two years of historical data. Without two years of data, APC will skip running the correlation.

The Corrections stage generates a catch-all curve and a padding curve. This requires a complete set a historical data for the specified fiscal year. This requirement can be satisfied with at least two years of historical data.

Historical data must be aggregated to a high enough level that APC can provide meaningful demand parameters. If APC performs calculations at levels such as color/store, the weekly rate of sales may be too low (below five units per week). The typical solution is to aggregate to a higher location level.

User Requirements

As an APC user, you must have an understanding of the historical data and an understanding of how the retail industry works in order to use APC effectively. In particular, you must have enough of an understanding of the historical data and the length of the life cycle of the items in the data to be able to identify:

- the weeks at the beginning of the historical data that contain the tail end data for items whose life cycle began before the start of the historical data
- the weeks at the end of the historical data that contain items whose life cycle ends after the historical data

You must also understand which promotions and holidays provide the most lift. Only the most significant events should be enabled for the APC to be effective. If you enables more than 25 events a year, the results may not be reliable.

Overview of APC User Interface

This section provides a high-level overview of how to use the APC UI.

Logging Into APC

The login screen requires the user to provide the user name and password for the database. Once the database authenticates the user, APC is available. Only one user can log into the application at a time. APC is a single-user application.

Navigation Within the User Interface

Once you log into the APC, you see the Preprocessing screen. Each subsequent screen has the same layout as this screen. Refer to the individual chapters for information about each stage.

You use the Process Train, located at the top of each screen, for navigation and to display the stage status. The circles indicate which stage you are viewing. An open circle indicates a stage that has not yet been viewed. A closed circle indicates a stage that has previously been viewed. A half filled-in circle indicates the current stage.

The words under the stage names indicate the status of the associated stage. Done indicates that the stage is complete. Clear indicates that the stage is either incomplete, stopped, or has an exception.

To navigate to a stage, either click on its name in the Process Train or use the Back and Next buttons to navigate between stages.

To access any of the tools from the Tools bar, click its name.

Common Buttons

Here is a list of the common buttons found within the User Interface. A subset of the following buttons is available in various of the screens. (Buttons limited to specific stages are described in the specific stage chapter.)

- Back – returns to previous page.
- Next – navigates to the next stage in the process train.
- Restore Default – clears any values that you have entered into the override fields and replaces them with the defaults.
- View Results – displays the results of a run.

- Run – starts the processing of a stage.
- Stop – terminates the current run.
- Save Changes – saves any changes.
- Undo Changes – clears any changes.
- Logout and Help – available at the top of each screen.
- For all options in all stages, a check box is used for parameters that are enabled or disabled and a text entry box is used to enter alternate values.

The APC Process

The operation of the APC is divided into stages. Each stage gathers related information and calculations together. The results of the computation of each stage can be kept for as long as the computation is valid. The stages can be run in order or a stage can be skipped if the results are still valid. Skipping stages, if a valid option, can improve performance.

Within each stage, you can perform the following three operations:

- Modifying the input values for the stage. Each stage has default values that you can change. Changing default values requires an in-depth understanding of how the APC works and the retail details of your business. You can modify the fields without immediately running the stage. Note that modifying the Base Historical Period can only occur after the Season Code stage is successfully run. This dependency exists because the Base Period dialog box displays the results of the Season Code stage calculations.

Note: You must examine Certain parameters, labelled with a Caution icon, before running any stages. See "[Changing Parameter Settings](#)" page 1-4 for details.

- Running the stage. Each stage performs its calculations during the run operation. Stages cannot be run simultaneously. After you run a stage, you can modify some of the fields in the stage. However, until you re-run the stage, the results of the stage do not change. Thus, you can continue to modify the fields or change them back to original values. It is recommended that you retain the results of a stage for as long as possible.
- Viewing the stage results. You can view the calculated results for the Pre-processing and Pruning stages after that stage has finished running.

You cannot in general run all stages of APC on the very first run. You need at least two runs. In the first run, run the APC through the Smoothing Stage, but not beyond. Based on this first run, set the Base Historic Period (in the Pruning Stage) by visually examining the chain-level seasonality curves using the Raw Seasonality Viewer. If the curve has a sharp fall-off, you should look at the sales dollars. You should make sure you have between 80% and 90% of the original sales dollars. After you have properly set the Base Historic Period, you can run the remaining stages (from Pruning onward). But to set the Base Historic Period from the results of Raw-AP you must run at least two runs when you first use APC with brand-new data. (Of course, after the Base Historic Period is set, you can run all stages in a single run.).

Here is a summary of the complete APC workflow.

1. Logging in – one user can log in at a time. Only one user can use APC at a time.

2. Data Validation – a summary of historical data can be used to check that the historical data has been loaded correctly. This information only needs to be checked when the historical data is new or has been reloaded.
3. Pre-processing – these settings can be changed.
4. Examination of Pre-processing Results – view details about how much data was filtered out by pre-processing. Verify that at least 80% of the sales dollars remain.
5. Season Code Selection – used to define the season code.
6. Levels Selection – within the Raw AP stage, select the merchandise and location levels for which APC will calculate the demand parameters.
7. Entering Raw AP Filtering Parameter – Raw AP filtering (in addition to pre-processing filtering).
8. Running Raw AP Calculation – produces the demand parameters.
9. Examination of Demand Parameters – view seasonality curves using the Raw Seasonality viewer.
10. Performing Smoothing – calculation of seasonality correlations.
11. Entering Base Historical Period – used to override a fiscal year. This can only be set after the Season code Setup stage is run.
12. Pruning – the pruning of partitions by setting reliability tolerances for demand parameters. This is used to eliminate unreliable partitions.
13. Examination of Pruning Results – view results of the partition filtering by using the Parameter Histogram viewer.
14. Examination of Summary Statistics – click View Results to view details about the pruning filtering (the partitions after pruning).
15. Performing Event Lift – adjust curves for holidays and promotions.
16. Performing Propagation of Seasonality Curves – copy curves to other fiscal years.
17. Entering Escalation Path – this is used by APC for the output. The default is to escalation along the merchandise hierarchy first, and then along the location hierarchy.
18. Output Stage – specify the output path.
19. Parameter Export – generate files for other analytic products.

Changing Parameter Settings

The following parameters labelled with a Caution icon, must be examined before running any of the stages in the APC, in order to determine whether or not the parameter values should be changed. Usually these are the only parameters you will need to change to run APC.

- Season Code Setup
 - Start Date Code
 - End Buckets
 - Map Attributes
- Raw AP
 - Merchandise Hierarchy

- Location Hierarchy
- Pruning Base Historical Period
- Event Lift
 - Catch-All Curve Fiscal Year
 - Padding Curve Fiscal Year (The fiscal year for this parameter and the above parameter must be a complete fiscal year.)
 - Holidays
 - Promotions (Only enable promotions and holidays that have a large traffic lift.)
- Output – escalation path

Dependencies

Each stage must be run in the order listed in the process train. Each stage is dependent on the previous one (i.e., all previous stages must have a status of complete before the current stage can be run).

Preprocessing

This chapter contains the following:

- ["Introduction"](#) on page 2-1
- ["The Preprocessing Interface"](#) on page 2-1
- ["Item Week Filters"](#) on page 2-2
- ["Item Filters"](#) on page 2-2
- ["Preprocessing Results Page"](#) on page 2-4

Introduction

The Preprocessing stage filters the historical data to produce a subset of data that will produce reliable demand parameters. It filters at the item and week level. It performs the initial pruning of bad activity data. It does the first stage of determining item eligibility and figures certain values that can later be used in the calculation of raw parameters.

This chapter contains descriptions of the parameters contained in the Preprocessing stage, which are used for filtering, as well as the default values and range of values for each parameter and an example of the Preprocessing results.

The default values of the parameters of the Preprocessing stage can be used to run the Preprocessing stage.

The Preprocessing Interface

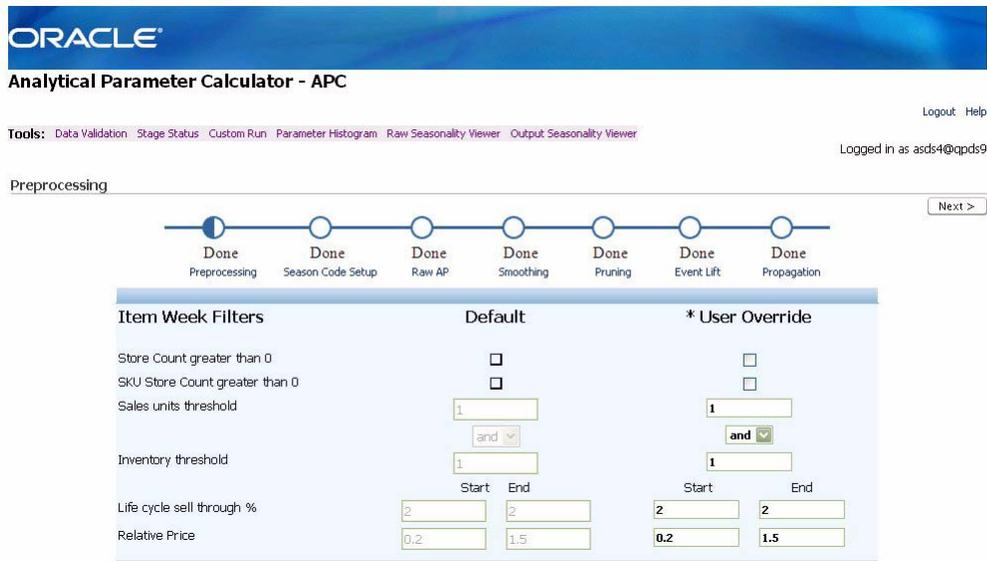
The Preprocessing page is accessed by clicking Preprocessing on the Process Train.

Details about using the interface to the APC can be found in [Chapter 1, "Getting Started"](#).

Item Week Filters

Here is an example of the Item Week Filters section of the Preprocessing stage.

Figure 2–1 Item Week Filters



These filters are used to filter out values that do not meet the requirement defined as specified for each filter, as described below.

Table 2–1 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Store Count greater than 0 – used to filter store count activities with null or zero store and sku-store count.	False	True/False
SKU Store Count greater than 0 – used to filter SKU store count activities with null or zero store and sku-store count.	False	True/False
Sales unit threshold – used to filter sales unit activities with sales units and/or inventory units below threshold values.	1	> = 1
Inventory threshold – used to filter inventory activities with sales units and/or inventory units below threshold values.	1	> = 1
Life cycle sell thru % – the item start and end dates are based on high and low sales unit quantities that are used to cut off the tails of the curve. Expressed as a percentage for the start date and the end date. Start sell thru is when the amount of sales reaches a certain quantity. The end date is calculated as 98% sell thru. So end date sell thru is 100% - end %.	Start: 2.0 End: 2.0	Start: > = 0; < = 50 End: > = 0; < start date
Relative price – relative price thresholds are used to filter out item weeks with a ratio of sales price to maximum ticket price falling outside the specified range for the start date and the end date.	Start: 0.2 End: 1.5	Start: > 0 End: > start value

Item Filters

Here is an example of the Item Filters section of the Preprocessing stage.

Figure 2–2 Item Filters

Item Filters

Min # eligible weeks	<input type="text" value="6"/>	<input type="text" value="6"/>
Min season (weeks)	<input type="text" value="6"/>	<input type="text" value="6"/>
Min sales units	<input type="text" value="10"/>	<input type="text" value="10"/>
Fraction of eligible weeks	<input type="text" value="0.6"/>	<input type="text" value=".4"/>

* If no override default will be used

These filters are used to filter out values that do not meet the requirement defined as specified for each filter, as described below.

Table 2–2 Item Filters

Filter Name and Description	Default Value	Range of Values
Min # eligible weeks – a certain number of weeks are necessary in order to determine item eligibility.	6	> 0
Min season (weeks) – a certain season length (the number of weeks between the first and last activity) is required in order to determine item eligibility.	6	> 0
Min sales units – the total number of units sold must be at least this value.	10	> 0
Fraction of eligible weeks – the percentage of eligible weeks, expressed as a fraction of the season length. The season length is the number of weeks between the start and end dates. (See Life cycle sell thru % above.)	0.6	> 0.0; < = 1.0

Preprocessing Results Page

Here is an example of the Preprocessing Results.

Figure 2–3 Preprocessing Results

Filter Name	Items Initial Count	Item Final Count	Activities Initial Count	Activities Final Count	NetSales Units Initial Count	NetSales Units Final Count	NetSales Dollars Initial Count	NetSales Dollars Final Count
1 : Preliminary filtering	99084	51861	0	0	0	0	0	0
2 : Low/High Sales %	0	0	4362385	1057723	17415715	16491026	333736764	318171958
3 : Low/High Relative Price	0	0	4362385	1034266	17415715	16351552	333736764	317410401
4 : Min # Eligible Weeks	99084	50065	4362385	1026064	17415715	15939026	333736764	312211900
5 : Min Sales Units	99084	49173	4362385	1019927	17415715	15931374	333736764	312027100
6 : Min Season Length	99084	49173	4362385	1019927	17415715	15931374	333736764	312027100
7 : Min % Eligible Weeks	99084	44753	4362385	958692	17415715	15772806	333736764	308333754

The Preprocessing Results page displays when you click View Results on the Preprocessing stage screen. Use the results of the preprocessing filtering to alter the settings, if necessary. The filters are applied in the order listed in the table. The initial count is the value before the filters are applied. Items are defined as the intersection of the Merchandise Hierarchy and the Location Hierarchy. Activities are defined per item week. Net Sales units are defined as the sum total in units for all weeks/all items. Net Sales dollars are defined as the sum total in dollars for all weeks/all items.

Note that even if the percentage of surviving activities or items is much lower than 90%, it is still possible for a very high percentage of the units sold and dollars sold to survive filtering since the activities or items that did not survive filtering could be responsible for only a very low percentage of units sold and dollars sold. In fact, typically when you view the pre-processing filter results page, you will see that a high percentage of units sold and dollars sold have survived filtering even though the percentage of surviving activities and items is quite low

Season Code Setup

This chapter contains the following sections:

- ["Introduction"](#) on page 3-1
- ["The Season Code Setup Interface"](#) on page 3-1
- ["Item Week Filters"](#) on page 3-2
- ["Adjacent Weeks"](#) on page 3-4
- ["Attribute Mapping"](#) on page 3-4

Introduction

The Season Code Setup stage determines the season codes to be used and maps them to items. It creates additional partitioning in the dataset by introducing a time dimension. This stage contains parameters for start week, end buckets, adjacent weeks, and attributes, which are discussed in the following sections.

The Season Code Setup Interface

The Season Code Setup page is accessed by clicking Season Code Setup on the Process Train.

Details about using all the interface to the APC can be found in [Chapter 1, "Getting Started"](#).

Item Week Filters

Here is an example of the Item Week Filters section of the Season Code Setup stage.

Figure 3–1 Item Week Filters

This section describes the start date code, end buckets, adjacent weeks, and attributes.

Start Date Code

Items (the intersection of the merchandise hierarchy and the location hierarchy) are assigned to a season code. Season codes identify the division of items by a time dimension. Seasonality curves are associated with season codes. The start date code is another name for the season code.

Season codes can be year-dependent or year-independent. All the season codes used in the Season Code Setup stage are year-dependent.

The start date is defined by the beginning of the life cycle (life cycle sell through of 2%) and the end of the life cycle (life cycle sell through of 98%) These are defined in the Pre-processing stage.

The default start date code type is Monthly. Other options (that you choose from the drop-down list) include Weekly, Biweekly, Quarterly, and Custom. All the items within a given start date code type are assigned the same start date code, which is associated with that type.

Start date codes are formatted as MM-YYYY. For example:

Table 3–1 Start Date Code Formats

Start Date Code Type	Format
Weekly	01-2008
	02-2008
	03-2008

	07-2008
BiWeekly	01-2008

Table 3–1 (Cont.) Start Date Code Formats

Start Date Code Type	Format
	02-2008
	03-2008

	26-2008
Monthly	01-2008
	02-2008
	03-2008

	12-2008
Quarterly	01-2008
	02-2008
	03-2008
	04-2008

End Buckets

End Buckets can be used to further partition the start date codes, based on the season length. The end buckets define the extensions to the start date code lengths at either end of the start date code. Each start date code can have a maximum of four buckets. The numbers defining the length of the buckets must be listed sequentially, beginning with the lowest number. End buckets are optional.

End buckets are formatted as an extension of the start date code formatting. For example:

01-2008-10 is used for an item that is in the start date code 01-2008 and has a bucket of ≤ 10 weeks.

01-2008-40 is used for an item that is in the start date code of 01-2008 and has a bucket of ≤ 40 weeks.

The default value for the end buckets is no season lengths. The range of values in a sequence of 0, 1, 2, 3, or 4 positive integers. The sequence must be a strictly-increasing sequence.

Adjacent Weeks

Here is an example of the Adjacent Week and Attribute Mapping sections of the Season Code Setup stage.

Figure 3–2 Adjacent Weeks and Attribute Mapping

Adjacent weeks are infrequently used. When adjacent weeks are used, the start date code includes items adjacent to a season that contribute to the smoothing of the seasonality curve. The weeks before extend the beginning of the start date code. The weeks after extend the end of the start date code.

The weight is a multiplier used in the construction of the seasonality curve. A weight of zero does not assign the item to the adjacent season code. A weight of one treats the item as if it were a normal item in the season code. The weighting does not affect the normal contribution of an item to its base season code.

The values for the adjacent weeks are:

Table 3–2 Adjacent Weeks Parameters

Name	Default Value	Range of Values
Adjacency weight (start - 3)*	0.0	> = 0.0, < = 1.0
Adjacency weight (start - 2)*	0.0	> = 0.0, < = 1.0
Adjacency weight (start - 1)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end + 1)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end + 2)*	0.0	> = 0.0, < = 1.0
Adjacency weight (end + 3)*	0.0	> = 0.0, < = 1.0

The In Season value cannot be changed.

Attribute Mapping

Attributes are used to associate every piece of merchandise with a customer-specific classification. Attributes serve to sub-divide the merchandise. Attributes are loaded from the APC database table asds_item_level_user_attr by clicking the Reload Attributes List button.

Seasonality curves can be regular, basic, or both. Basic curves ignore the start date.

If, for example, a retailer uses a set of classifications such as short, long, and basic, then the Attribute Mapping table would look like this.

Table 3–3 Example Attribute Mapping Table

Attribute	Basic	Regular
Short (S)	<check box>	<check box>
Long (L)	<check box>	<check box>
Basic (B)	<check box>	<check box>
None	<check box>	<check box>
All	<check box>	<check box>

Note that the Save Changes button and the Undo Changes button are used only with the Attribute Mapping table. If both regular and basic are checked, then both calculations are used to determine the seasonality curve. The Attribute Mapping table must contain at least one entry.

Every customer has the attributes None and All. If All is checked, then the attributes are disregarded.

Attributes are formatted as follows (including buckets):

S-01-2008-10

S-02-2008-20

The attribute mapping table must have at least one check box checked. The default value is that the All row has both the Regular and Basic check boxes checked and all other check boxes unchecked.

This chapter contains the following:

- ["Introduction"](#) on page 4-1
- ["The Raw AP Interface"](#) on page 4-1
- ["Selecting Hierarchy Levels"](#) on page 4-2
- ["Seasonality Settings"](#) on page 4-2
- ["Item-Week Filters"](#) on page 4-3
- ["Markdowns"](#) on page 4-3
- ["Partition Filters"](#) on page 4-4
- ["Elasticity Target"](#) on page 4-4

Introduction

The Raw AP stage produces the demand parameters. It analyzes the filtered and partitioned data to estimate raw parameters seasonality and price elasticity. The results are summarized at various merchandise/location hierarchy levels.

The Raw AP Interface

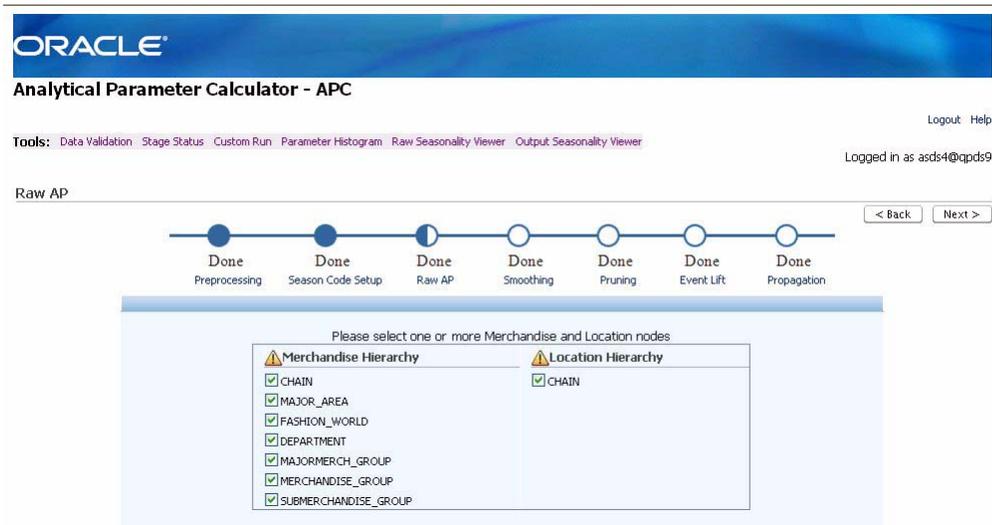
The Raw AP page is accessed by clicking Raw AP on the Process Train.

Details about using all the interface to the APC can be found in [Chapter 1, "Getting Started"](#).

Selecting Hierarchy Levels

Here is an example of the Hierarchy Levels section of the Raw AP stage.

Figure 4–1 Hierarchy Levels



Select the merchandise and location levels for which APC should calculate demand parameters. The APC calculates demand parameters for the partitions of the levels that are the cross products of all the levels you select. For example, if you select Chain and Division for the merchandise levels and Chain and Region for the location levels, then APC calculates demand parameters for the partition in Chain/Chain, Chain/Region, Division/Chain, and Division/Region.

Seasonality Settings

Here is an example of the Seasonality Setting section of the Raw AP stage.

The seasonality settings establishes the length and start date of the raw seasonality curve.

Table 4–1 Seasonality Settings

Setting Name and Description	Default Value	Range of Values
Seasonality Length – determines the length of the raw curves for regular (non-basic) season codes. The length from the start determines how many weeks after the start date are in the curve. This value does not take length buckets into consideration.	52	> = 1
Start Week – raw curves for basic season codes are always 53 weeks long. This parameter sets the starting week of the basic season code curves in terms of fiscal week number.	1	> = 1, < = 52

Item-Week Filters

Here is an example of the Item Week Filters of the Raw AP stage.

Figure 4–2 Item Week Filters

The following item-week filters are more stringent than the preprocessing filters.

Table 4–2 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Relative Price – used to filter out item-weeks with a ratio of sales price to maximum ticket price that falls outside the specified range.	Lower: 0.2 Upper: 1.5	Lower: ≥ 0 Upper: $>$ Lower value
Relative Inventory – the upper and lower bounds for the value for inventory relative to maximum inventory.	Lower: 0.2 Upper: 1.5	Lower: ≥ 0 Upper: $>$ Lower value; ≤ 1.0

Markdowns

Here is an example of the Markdowns Parameters section of the Raw AP stage.

Figure 4–3 Markdowns

Use the markdowns parameters to define what you consider a markdown to be.

Table 4–3 Markdowns Parameters

Markdowns Parameters Name and Description	Default Value	Range of Values
Time Window – defines the weeks before and after the markdown. The preceding weeks value is the # weeks before the markdown occurred. The following weeks value is the # weeks after the markdown and includes the week of the markdown. A week is a calendar week.	2	≥ 2
Min Eligible Weeks – the week that precedes two calendar weeks in which an item is actually sold (i.e., two weeks that contain data).	> 0	6
Max Deviation – the standard deviation of the regular price in the weeks before and after the markdown. Provides stability on the variance.	0.1	> 0.0
Markdown Ratio – the average price in the weeks following the markdown that satisfies all conditions.	0.9	$> 0.0; < 1.0$

Partition Filters

Here is an example of the Partition Filters section of the Raw AP stage.

Figure 4–4 Partition Filters

The eligible items threshold filter is used to filter merchandise/location/season code partitions with the number of eligible items below the specified threshold. It looks at the items that have already been filtered using the above filters. This defines the minimum number of items required for raw AP to continue calculating demand parameters. The default value is 10. The range is ≥ 0 .

Elasticity Target

Here is an example of the Elasticity Target section of the Raw AP stage.

Figure 4–5

Elasticity is the effect of markdowns on unit sales. If the value is too low, then no markdowns can be recommended.

Table 4–4 Elasticity Target Parameters

Elasticity Parameter Name and Description	Default Value	Range of Values
Enable Gamma Transform – turns on the gamma transform.	True	True/False
Gamma Transform Target – minimum and maximum values for transformed gamma.	Min: 1.4 Max: 2.3	Min: ≥ 0.0 Max: $> \text{Min}$

This chapter contains the following:

- ["Introduction"](#) on page 5-1
- ["The Smoothing Interface"](#) on page 5-1
- ["Seasonality Correlation Period"](#) on page 5-1

Introduction

The Smoothing stage calculates the seasonality correlations. This process consists of calculating the year-to-year correlation for different years of data by using the portion of the seasonality curve that falls between the low and high sales percentages. By default, the first 2% and the last 15% are not considered in defining the seasonality correlation period. This prevents an artificial inflation of the seasonality curves.

The Smoothing Interface

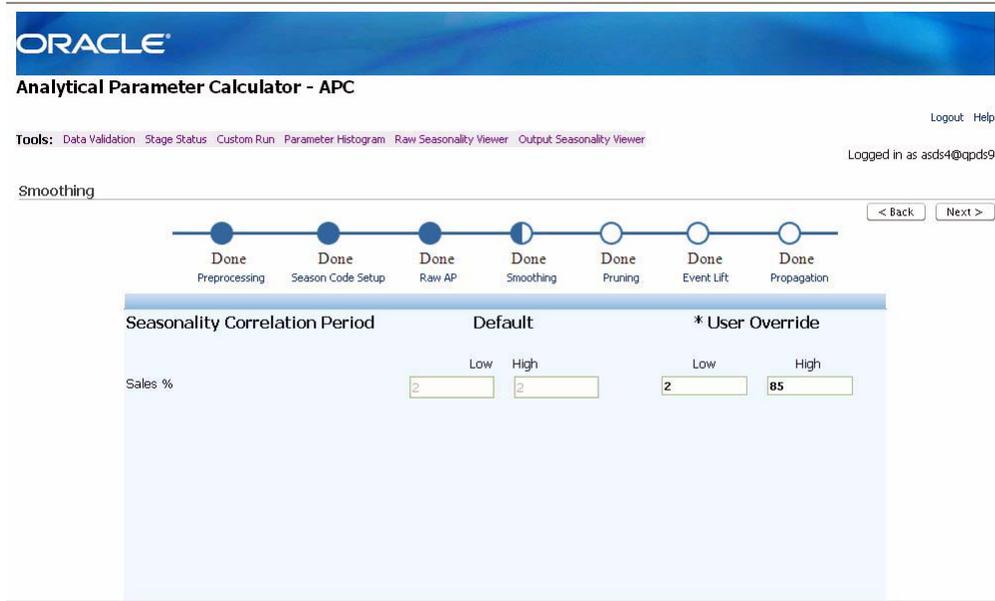
The Smoothing page is accessed by clicking Smoothing on the Process Train.

Details about using the interface to of the APC can be found in [Chapter 1, "Getting Started"](#).

Seasonality Correlation Period

Here is an example of the Seasonality Correlation Period of the Smoothing stage.

Figure 5–1



This stage has two parameters (low and high): the seasonality correlation period Sales %.

Table 5–1 Seasonality Correlation Period

Filter Name Description	Default Value	Range of Values
Sales % - the low and high sales percentage values	2%	Low: > = 0% High: < = 50%

This chapter contains the following:

- ["Introduction"](#) on page 6-1
- ["The Pruning Interface"](#) on page 6-1
- ["Data Sufficiency"](#) on page 6-1
- ["Item Week Filters"](#) on page 6-2
- ["Year-to-Year Pruning"](#) on page 6-3
- ["Base Historic Period"](#) on page 6-3
- ["Pruning Filtering Results"](#) on page 6-4
- ["Pruning Seasonality Results"](#) on page 6-5

Introduction

The Pruning stage is used to remove unreliable demand parameters. It removes merchandise/location/season code partitions from the APC. The two pruning methods are:

- remove all partitions except for those in the Base Historic Period
- determine which curves in the Base Historic Period are sufficient and reliable

The Pruning Interface

The Pruning page is accessed by clicking Pruning on the Process Train.

Details about using the interface to the APC can be found in [Chapter 1, "Getting Started"](#).

Data Sufficiency

Default data sufficiency thresholds are appropriate for most clients. If a client has low item counts or low rates of sale at the lowest parameter level, then the corresponding threshold can be lowered. More parameters will be kept, but future reliability may suffer. Note that Prune curves with missing dates and top level curves are generally kept enabled.

Item Week Filters

Here is an example of the Item Week Filters section of the Pruning stage.

Figure 6–1 Item Week Filters

Item Week Filters	Default	* User Override
Partition-level overrides	<input type="checkbox"/>	<input type="checkbox"/>
Keep top level curves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Prune curves with missing dates	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Eligible items threshold	<input type="text" value="10"/>	<input type="text" value="10"/>
Average weekly sales threshold	<input type="text" value="25"/>	<input type="text" value="25"/>
Raw seasonality length threshold	<input type="text" value="10"/>	<input type="text" value="10"/>

The following table provides descriptions, default values, and the range of values for the item week filters.

Table 6–1 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Partition-level Overrides – pruning can be done at the partition level if all partitions are defined in the ASDS_PRUNING_PARAMETERS table. This will override the pruning parameters. Any partitions not specified in this table will not be pruned.	True	True/False
Keep top level curves – all the highest level curves are kept, regardless of threshold values.	True	True/False
Prune curves with missing dates – permits pruning of basic curves with missing dates.	True	True/False
Eligible items threshold – partitions with fewer numbers of eligible items than the threshold value are removed. Eligibility is defined during pre-processing.	0.5	$> = 0.0; < = 1.0$
Average weekly sales threshold – partitions with average weekly sales below the threshold are removed. Weekly sales are the sum of all sales for all activities for a given week.	25	$> = 0$
Raw seasonality length threshold – allows curves to be discarded when the number of weeks from the first non-zero seasonality value to the last non-zero seasonality value is less than the threshold. It is possible, in Raw AP, that many seasonality values of zero have been added to the curves. Note that basic season codes have a length of 53, so picking a value greater than 53 will prune out any basic season codes.	10	$> = 0$

Year-to-Year Pruning

Here is an example of the Year-to-Year section of the Pruning stage.

Figure 6–2 Year-to-Year Pruning

Season Code	Base Year
03	2007
04	2007
05	2007
06	2007
07	2007
08	2006
09	2006
10	2006
11	2006
12	2006

The year-to-year pruning setting requires additional analysis. The default seasonality correlation is 0.5, but curves between 0.5 and 0.7 should be inspected or run through parent-to-child correlation analysis. Curves with only one year of data should also be inspected or run through parent-to-child correlation analysis.

The following table provides descriptions, default values, and the range of values for the year-to-year pruning parameters.

Table 6–2 Year to Year Pruning

Filter Name and Description	Default Value	Range of Values
Year-to- year pruning - allows pruning based on the BHP.	True	True/False
Pruning single cycle - allows pruning of curves with only one year of data.	True	True/False
Seasonality correlation threshold - removes curves if the maximum correlation between the BHP curve and other curves with that merchandise and location ID and the same year-invariant season code is lower than the threshold. For example, if the merchandise/location of 1/1 had a curve for 2001-01, 2002-01, and 2003-01, and the 2003-01 curve is the BHP curve, if the correlation between either 2001-01 and 2003-01 or 2002-01 and 2003-01 is greater than the threshold, then it passes the threshold.	0.5	> = 0.0, < = 1.0
Maximum elasticity error -	0.3	> 0.0

Base Historic Period

The base Historic Period (BHP) table can only be loaded by clicking the Reload Season Codes button once the Season Code setup stage is complete. The table contains two columns. The first column lists the year-independent client-specific season codes. The second column lists the base fiscal year.

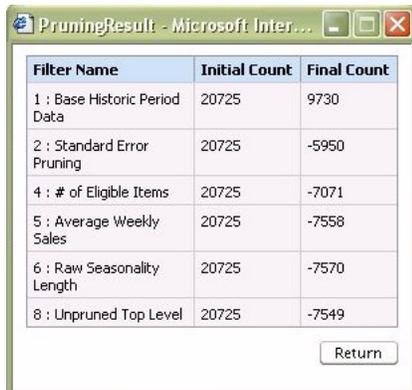
Different rows can have different years. Alternatively, you can set the fiscal year for all rows by selecting a year using the table tool bar and then clicking the Set all BHPD button.

Do not select a year-dependent season code that is too close to the beginning of the historical data or too close to the end of the historical data.

Pruning Filtering Results

Here is an example of the Pruning Filtering Results.

Figure 6–3 Pruning Filtering Results



The screenshot shows a web browser window titled "PruningResult - Microsoft Inter...". Inside the window is a table with three columns: "Filter Name", "Initial Count", and "Final Count". The table contains six rows of data. Below the table is a "Return" button.

Filter Name	Initial Count	Final Count
1 : Base Historic Period Data	20725	9730
2 : Standard Error Pruning	20725	-5950
4 : # of Eligible Items	20725	-7071
5 : Average Weekly Sales	20725	-7558
6 : Raw Seasonality Length	20725	-7570
8 : Unpruned Top Level	20725	-7549

The Filtering Results page displays the initial count before the specified filter is applied and the final count after the specified filter is applied. The filters are listed in the order they are applied.

Pruning Seasonality Results

Here is an example of the Pruning Seasonality results.

Figure 6–4 Pruning Seasonality Results

Total	Min Value	Max Value	Value Average	Earliest	Latest
44783	.001	33.163	1	Dec 25, 2005	Sep 21, 2008

Level Name	Curve Count
Location-CHAIN	774
Merchandise-SUBMERCHANDISE_GROUP	94
Merchandise-MERCHANDISE_GROUP	125
Merchandise-MAJORMERCH_GROUP	205
Merchandise-DEPARTMENT	183
Merchandise-FASHION_WORLD	82
Merchandise-MAJOR_AREA	42
Merchandise-CHAIN	43
Total	774

Season Code	Curve Count
02-2007	56
03-2007	56
04-2007	64
05-2007	52
06-2007	32
08-2006	56
09-2006	44
10-2006	50
11-2006	47
B-2006	16

The Seasonality Results page displays when you click the View Seasonality Results button. It provides a check on the quality of the data. It is divided into three sections and shows the counts of the curves that survived pruning.

The first section displays information about season codes over all partitions. The value for Value Average should be close to 1.

The second section displays the number of curves by level.

The third section displays the number of seasonality curves per season code.

This chapter contains the following:

- ["Introduction"](#) on page 7-1
- ["The Event Lift Interface"](#) on page 7-1
- ["Curve Creation"](#) on page 7-2
- ["Events"](#) on page 7-3

Introduction

In the Event Lift stage, the curves for the regular season codes are extended, all curves are padded, and event lifts are calculated. The purpose is to correct seasonality curves in order to account for holiday and promotion lifts.

The Event Lift Interface

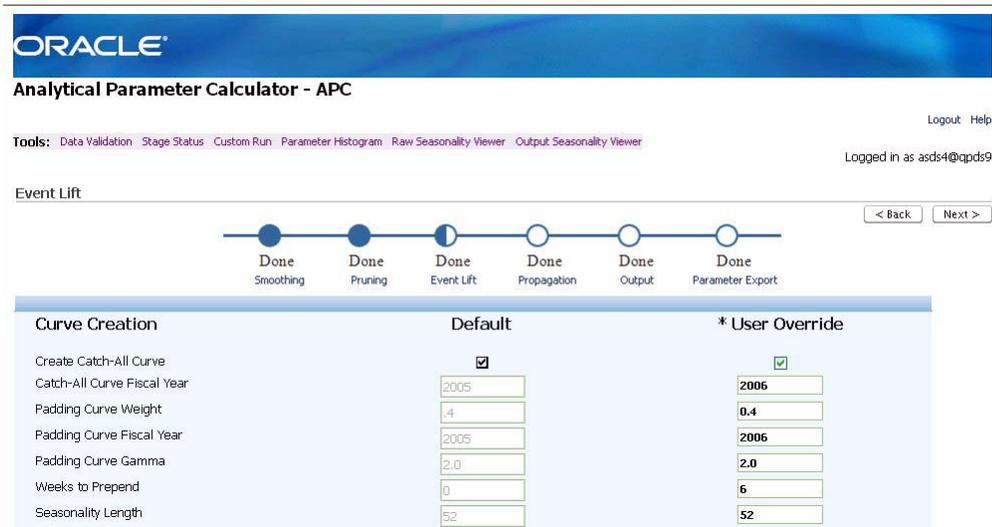
The Event Lift page is accessed by clicking Event Lift on the Process Train.

Details about using the interface to the APC can be found in [Chapter 1, "Getting Started"](#).

Curve Creation

Here is an example of the Curve Creation section of the Event Lift stage.

Figure 7-1 Curve Creation



The following parameters are used to configure the padding of all curves and the extension of regular season code curves.

Table 7-1 Catch-All Curves

Catch-All Curve Parameter Name and Description	Default Value	Range of Values
Create Catch-All Curve - the catch-all seasonality curve is created above the Chain/Chain level so that all items will be given a minimum of one seasonality curve.	True	True/False
Catch-All Curve Fiscal Year - the year specified for the creation of the seasonality curve.		A fiscal year from the historical data.

The padding curve parameters include Padding Curve Weight, Padding Curve Fiscal Year, Padding Curve Gamma, Weeks to Prepend, and Seasonality Length. These parameters determine:

- the shape of the padding curve
- how much of the curve is applied to each extended curve

The padding seasonality curve is determined by using the value of gamma to create a deprived curve for the highest merchandise/location partition for each season code in the given fiscal year. The final seasonality curve is calculated as $\text{weight} * \text{padding curve} + (1 - \text{weight}) * \text{seasonality curve}$.

Table 7-2 Padding Curves

Padding Curve Parameter Name and Description	Default Value	Range of Values
Padding Curve Weight - the value used in determining the final seasonality curve.	0.4	> 0.0; < 1.0
Padding Curve Fiscal Year - the year specified for the creation of the padding curve.		
Padding Curve Gamma - price elasticity, i.e., a measure of the increase in sales as the price decreases.	2.0	> 0.0
Weeks to Prepend - number of weeks to add to the curve	0	>= 0
Seasonality Length - Seasonality Length - the seasonality curve is extended before it is padded. If the length of the curve from start date to end date is longer than the length of the Raw AP, then the difference is added. Otherwise, it is not changed. This applies to regular season codes only.	52	>= 1

Events

Holidays and promotions must be removed from seasonality curves in this stage, as APC does not correct for holidays and promotions in the Raw AP stage. You should not use too many holidays and promotions for this process. The sum of the holidays and the promotions in a given calendar year should not be greater than 25, on average. If you use more than this, the lift from the event will not impact the APC's calculations.

Here is an example of the Events section of the Event Lift stage.

Figure 7-2 Event Lift Events

The screenshot displays the 'Events' section of a software interface. At the top, there are buttons for 'Save Changes', 'Undo Changes', a 'Holiday Set' dropdown menu, and a 'Load Holiday Set' button. Below this is a table with the following columns: Event ID, Year, Event Description, Start Date, End Date, Days Prior, Days After, Used, Year-Ind. ID, and Baseline Type. The table contains 10 rows of data for events from 2004 to 2005. The 'Used' column has dropdown arrows, and the 'Baseline Type' column has 'linear' text and dropdown arrows. Below the table is a 'Promos' section with a 'Load Promos' button and an empty table with the same column headers. At the bottom right, there are buttons for 'Restore Default', 'Run', and 'Stop'. A small note at the bottom left states: '* If no override default will be used'.

Event ID	Year	Event Description	Start Date	End Date	Days Prior	Days After	Used	Year-Ind. ID	Baseline Type
1001	2004	New Years Day	Jan 1, 2005	Jan 1, 2005	3	1	N	1	linear
1002	2005	Carnival	Feb 8, 2005	Feb 8, 2005	7	1	Y	2	linear
1003	2005	Easter	Mar 27, 2005	Mar 27, 2005	6	6	Y	3	linear
1004	2005	Labor Day	May 1, 2005	May 1, 2005	6	1	Y	4	linear
1005	2005	Ascension	May 5, 2005	May 5, 2005	7	1	Y	5	linear
1006	2005	Corpus Christi	May 26, 2005	May 26, 2005	7	1	Y	6	linear
1007	2005	German Unification	Oct 3, 2005	Oct 3, 2005	7	1	Y	7	linear
1008	2005	All Hallows	Nov 1, 2005	Nov 1, 2005	7	1	Y	8	linear
1009	2005	Christmas Day	Dec 25, 2005	Dec 25, 2005	17	5	Y	9	linear
1010	2005	New Years Day	Jan 1, 2006	Jan 1, 2006	3	1	N	1	linear

Holidays

This section describes the holiday list.

After you select the holiday set from the drop-down list, you can load the holidays into APC using the Load Holiday Set button. The holidays are located in `ASDS_EVENT_HOLIDAY_SET_TBL`.

The baseline type determines how to smooth the seasonality curve. If you select the linear option, APC looks at X days before and X days after and draws a straight line between them.

Promotions

This section describes the promo list.

You can load promotions into APC using the Load Promos button. The promotions are located in `ASDS_EVENT_PROMOS_TBL`.

Propagation

This chapter contains the following:

- ["Introduction"](#) on page 8-1
- ["The Propagation Interface"](#) on page 8-1
- ["Seasonality Coverage"](#) on page 8-2

Introduction

The Propagation stage is used to copy historical seasonalities backward and forward in time. This includes re-applying event lifts according to the event calendar configured in the previous stage. This stage removes promo lifts and holiday lifts.

During propagation, you can:

- decide whether or not to remove a promotion from a curve
- determine how many years to create output curves for
- determine the type of output seasonality, single cycle or multi-cycle

The Propagation Interface

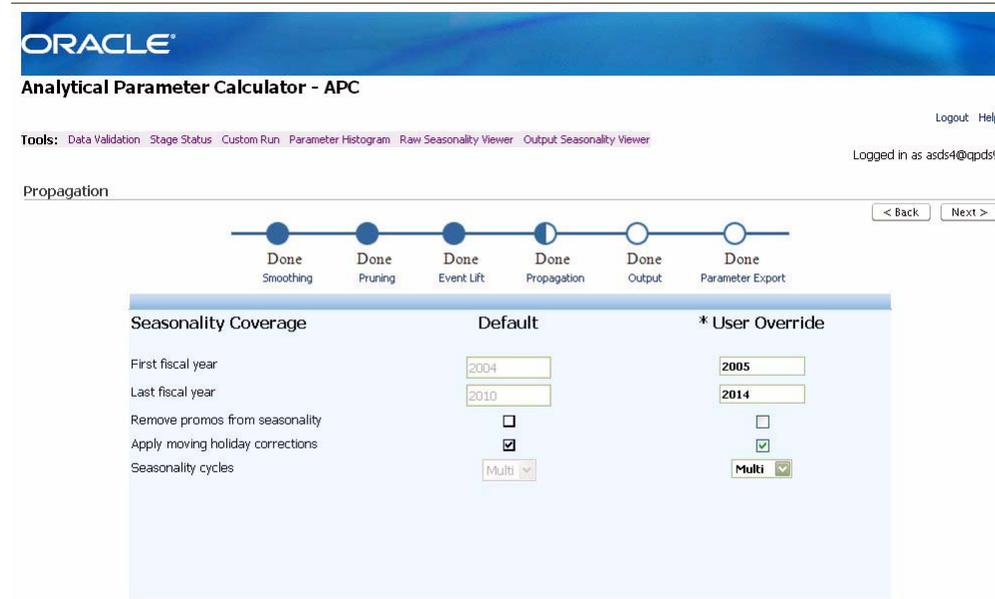
The Propagation page is accessed by clicking Propagation on the Process Train.

Details about using the interface for the APC can be found in [Chapter 1, "Getting Started"](#).

Seasonality Coverage

Here is an example of the Propagation stage.

Figure 8–1 Propagation



The following parameters are used for propagation.

Table 8–1 Propagation Parameters

Propagation Parameter Name and Description	Default Value	Range of Values
First Fiscal Year - The first fiscal year and the last fiscal year are used to create copies of the base curves for each of the years you enter. Holidays are re-applied to these curves, so it is important that the coverage matches the events table, or the moving holiday and promotions corrections will not be applied for those years. Seasonality curves should be propagated at least five years beyond the current year.	2004	> 2004
Last Fiscal Year - The first fiscal year and the last fiscal year are used to create copies of the base curves for each of the years you enter. Holidays are re-applied to these curves, so it is important that the coverage matches the events table, or the moving holiday and promotions corrections will not be applied for those years. Seasonality curves should be propagated at least five years beyond the current year.	2010	> 2004

Table 8-1 (Cont.) Propagation Parameters

Propagation Parameter Name and Description	Default Value	Range of Values
Remove Promos from Seasonality - used to remove promotions from the seasonality curves.	False	True/False
Apply Moving Holiday Corrections - used to propagate moving holiday corrections. It is recommended that this almost always be enabled.	True	True/False
Seasonality Cycles - the value is either single-cycle or multi-cycle. The life cycle length histogram and information about your planned outdates should determine whether you should use multi-cycle or single-cycle seasonalities. For the multi-cycle seasonality type, each curve has multiple yearly seasonal cycles, one cycle per year. The length of the curve is determined by the first fiscal year and the last fiscal year. A multi-cycle is limited to 52 weeks. For the single-cycle seasonality type, each curve has a single-cycle. The length of the curve is determined by the Raw AP and Correction stages. The number of curves is determined by the first fiscal year and the last fiscal year. A single-cycle can be longer than 52 weeks.	Multi	Single/Multi

Output and Parameter Export

This chapter contains the following:

- ["Introduction"](#) on page 9-1
- ["The Output Interface"](#) on page 9-1
- ["Item Week Filters"](#) on page 9-2
- ["Escalation Path"](#) on page 9-2
- ["Parameter Export"](#) on page 9-3

Introduction

The Output stage is used after the analyst has completed the configuration. It converts propagated seasonalities and other parameters into the final format required by the analytic application. You can enable or disable particular parameters in the output. You can also specify the merchandise hierarchy-location hierarchy search escalation path. The first time you access the Output stage, the table is empty.

The output files are produced in the format required by the analytic application. Once you are finished with the Output stage, you are taken to the Parameter Export stage.

The Output Interface

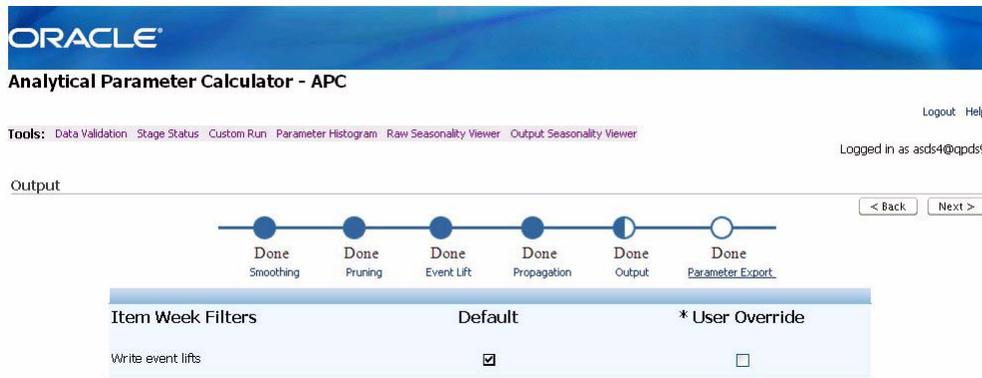
The Output page is accessed by clicking Output on the Process Train.

Details about using the interface for the APC can be found in [Chapter 1, "Getting Started"](#).

Item Week Filters

Here is an example of the Item Week Filters section of the Output stage.

Figure 9–1 Item Week Filters



The following values determine the APC output.

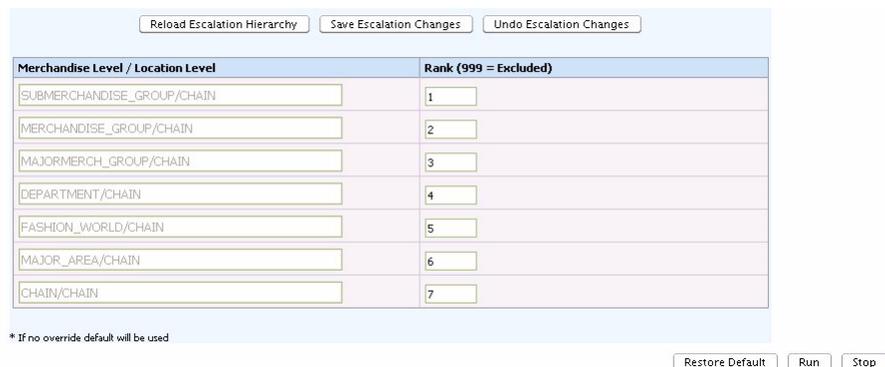
Table 9–1 Item Week Filters

Filter Name and Description	Default Value	Range of Values
Write Event Lifts - enables event lifts as an output value.	True	True/False

Escalation Path

Here is an example of the Escalation Path section of the Output stage.

Figure 9–2 Escalation Path



You load the escalation hierarchy using the Reload Escalation Hierarchy button. The Rank defines the escalation path, which is part of the APC output (but is not used by APC). The default escalation path is first along the location hierarchy, and then along the merchandise hierarchy. It is based on the levels selected in the Raw AP stage and is only available after the Raw AP stage has been run. It runs consecutively from the lowest value to the highest value. The value 999 indicates that the associated level should not be included in the escalation path.

Parameter Export

Once all the previous stages are complete, you see the Parameter Export screen. This indicates that the APC database schema has been updated with the APC results. The results are ready for export.

This chapter contains the following:

- ["Introduction"](#) on page 10-1
- ["Data Validation"](#) on page 10-2
- ["Stage Status"](#) on page 10-3
- ["Custom Run"](#) on page 10-4
- ["Parameter Histogram"](#) on page 10-4
- ["Raw Seasonality Viewer"](#) on page 10-6
- ["Output Seasonality Viewer"](#) on page 10-7

Introduction

The Tools Bar appears at the top of each screen and provides access to:

- Data Validation – provides a summary of the historical data for a given period of time.
- Stage Status - provides access to the stage status.
- Custom Run – provides a way to run all the stages or a subset of the stages sequentially without interruption.
- Parameter Histogram - displays a histogram of the elasticities or inventory effect for selected partitions that have passed pruning.
- Raw Seasonality Viewer – displays a graph of selected seasonality curves after the Raw AP stage has been run.
- Output Seasonality Viewer – displays a graph of selected seasonality curves after the Output stage has been run.

Data Validation

Here is an example of the Data Validation data.

Figure 10–1 Data Validation

Summary		
merchandise count	115423	
location count	1	
item count	115423	
calendar extent	11-MAR-01	28-OCT-18
data extent	09-OCT-05	25-NOV-07
merchandise levels	9	
location levels	3	
data merchandise level	COLOR	
data location level	STORE_CL5TR	

Level Desc	Element Count
Location-STORE	65
Location-STORE_CL5TR	1
Location-CHAIN	1
Merchandise-COLOR	115427
Merchandise-ARTICLE/STYLE	62401
Merchandise-SUBMERCHANDISE_GROUP	2660
Merchandise-MERCHANDISE_GROUP	1311
Merchandise-MAJORMERCH_GROUP	399
Merchandise-DEPARTMENT	62
Merchandise-FASHION_WORLD	6
Merchandise-MAJOR_AREA	3
Merchandise-CHAIN	1

The APC validates historical data and loads it into the APC database after the application is first configured. The data validation chart is useful for examining a summary of the data after a change, such as a data refresh, has occurred in the historical data.

The data validation chart contains the following:

- merchandise count – the number of distinct merchandise IDs in the historical items.
- location count – the number of distinct location IDs in the historical items.
- item count – the total number of historical items.
- calendar extent – the extent of the `asds_calendars_in_tbl` imported from the related application.
- data extent – the extent of the historical data.
- merchandise levels – from the `asds_client_hierarchy_tbl`, which is the input table constructed from the `merch_hierarchy_in_tbl`.
- location levels – the count of the location levels.
- data merchandise levels – the name of the merchandise level used
- data location levels – the name of the location level used
- Level Desc/Element Count – the counts for each location and merchandise hierarchy level.

Stage Status

Here is an example of the Stage Status data.

Figure 10–2 Stage Status

Stage	Running Status	Run Time	Start Time	Finish Time	Exception
Preprocessing	Complete	118.83	08/08/2008 20:53:34	08/08/2008 20:55:33	
SeasonCodeSetup	Complete	126.64	08/08/2008 20:55:33	08/08/2008 20:57:40	
RawAP	Complete	317.89	08/08/2008 20:57:40	08/08/2008 21:02:58	
Smoothing	Complete	154.66	08/08/2008 21:02:58	08/08/2008 21:05:32	
Pruning	Complete	304.09	08/08/2008 21:05:32	08/08/2008 21:10:37	
Corrections	Complete	166.92	08/08/2008 21:10:37	08/08/2008 21:13:24	
Propagation	Complete	675.06	08/08/2008 21:13:24	08/08/2008 21:24:39	
Output	Complete	204.16	08/08/2008 21:24:39	08/08/2008 21:28:03	
ParameterExport	Complete	173.88	08/08/2008 21:28:03	08/08/2008 21:30:57	

The Custom Run option provides access to the Stage Status page, which displays the status of each stage along with any dependencies. It includes the start and finish time (if a stage has completed) of each stage.

The possible values for status include:

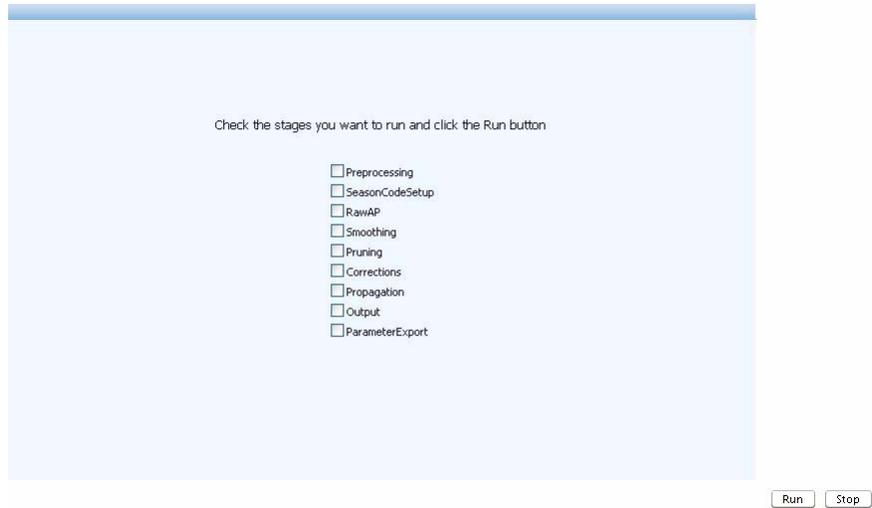
Table 10–1 Stage Status Values

Status Value	Meaning of Status Value
Complete	The stage ran to completion
Running	The stage is currently in the process of executing.
Stopped	The user terminated the run.
Incomplete	The stage has not finished.
Exception	An error occurred.

Custom Run

Here is an example of the Custom Run.

Figure 10–3 Custom Run



The Custom Run option allows you to select all the stages or some subset of the stages and run them sequentially without interruption. By using this feature, you can set up APC to run without monitoring the process.

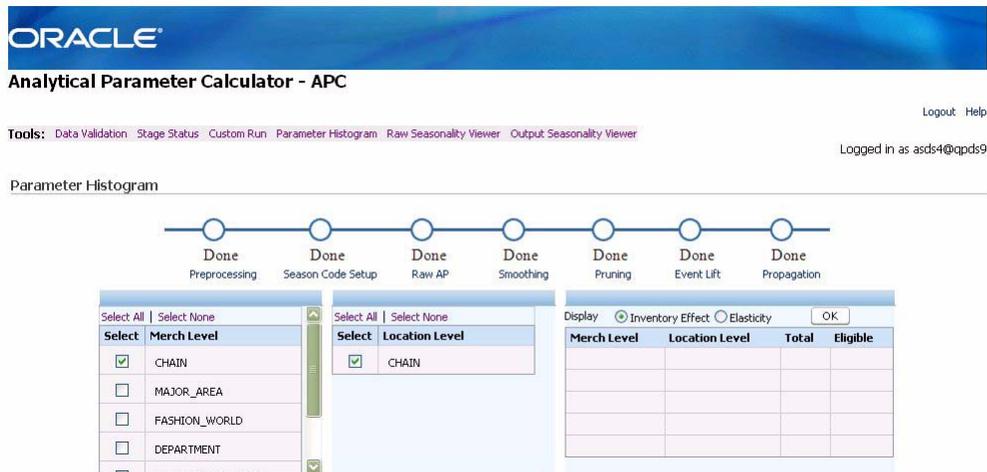
Parameter Histogram

The Parameter Histogram option provides a histogram of the demand parameters elasticity or inventory effect for partitions after pruning is complete. The histogram provides information that can be used to adjust the parameter configuration.

The Histogram screen is divided into two major sections.

Here is an example of the top section.

Figure 10–4 Histogram Options



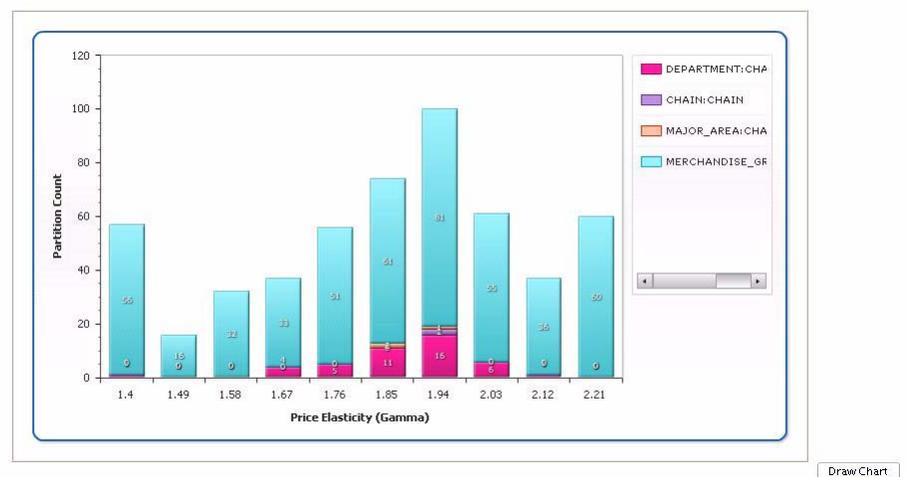
The top section contains select lists for merchandise levels and location levels. These levels are derived from the levels you selected during the Raw AP stage. Using these two lists, you select the merchandise levels and locations levels you are interested in seeing charted.

Once you have selected the levels you are interested in, you must also select the demand parameter you are interested in seeing charted: Inventory Effect or Elasticity. Select one of these options and click OK. The display list is populated with all the combinations of the merchandise and location levels you originally selected. To maximize the display quality of the histogram, this list of combinations should be no greater than 6.

After you have made all the necessary selections in the top part of the screen, click Draw Chart in order to generate the histogram.

Here is an example of the bottom section.

Figure 10–5 Histogram



Each of the merchandise level/location level combinations is assigned a different color. The partitions and their associated colors are listed in the top right corner.

The histogram itself is dynamic: The size of the bars and the numbers used for the partition count along the y axis and the number used for the price elasticity or inventory effect along the x axis will depend on the data used to generate the histogram.

The numbers along the x axis refer to the center of each bar. The bars are divided proportionally by the color of each partition.

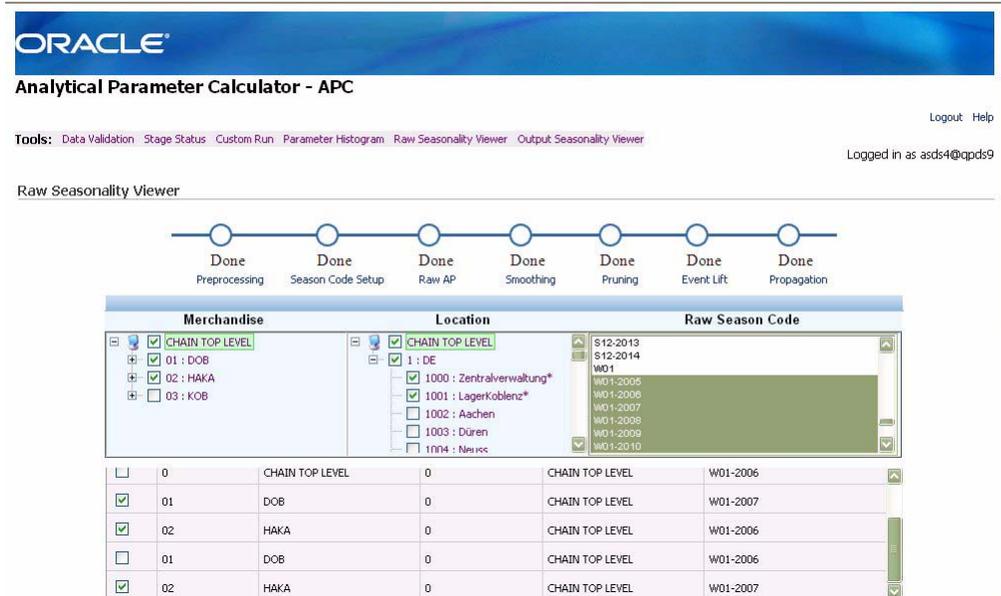
You can click any of the color sub-divisions of any of the bars. The color of the selected sub-division changes color for easier visualization.

Raw Seasonality Viewer

The Raw Seasonality Viewer option provides a graph of the seasonality curves after the Raw AP stage has been run.

Here is an example of the Raw Seasonality Viewer options.

Figure 10–6 Raw Seasonality Viewer Options

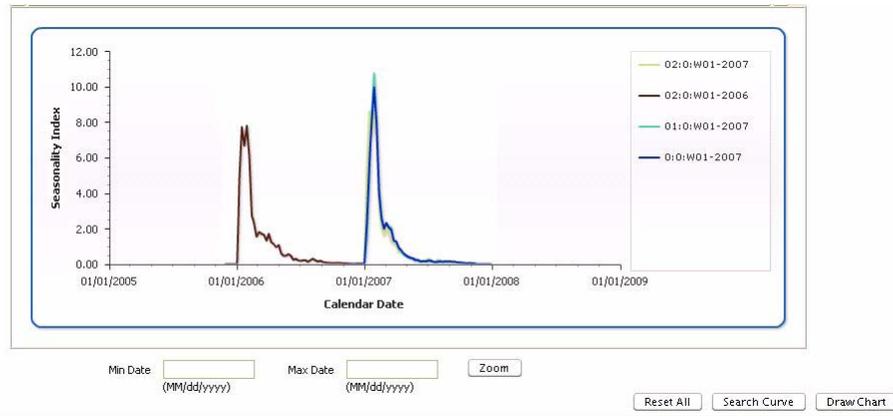


Use the topmost section to select the merchandise levels, location levels, and season codes you are interested in seeing graphed. Click Search Curve. You will see a list of the available seasonality curves.

To generate the graph, click the check boxes for the seasonality curves you want to display and click Draw Chart.

Here is an example of the Raw Seasonality Viewer chart.

Figure 10–7 Raw Seasonality Viewer Chart



The list of available seasonality curves and their associated colors are listed in the top right corner of the bottom section of the screen. A graph is displayed for each

seasonality curve listed. The values used in the x axis and the y axis are dynamic, depending on the data used to generate the graphs.

You can narrow the time range used in the x axis by entering the Minimum and Maximum dates you are interested in, using the format MM/DD/ YYYY), and clicking Zoom. The display changes to show the time range you specified. To change the date range, enter the new dates and click Zoom again.

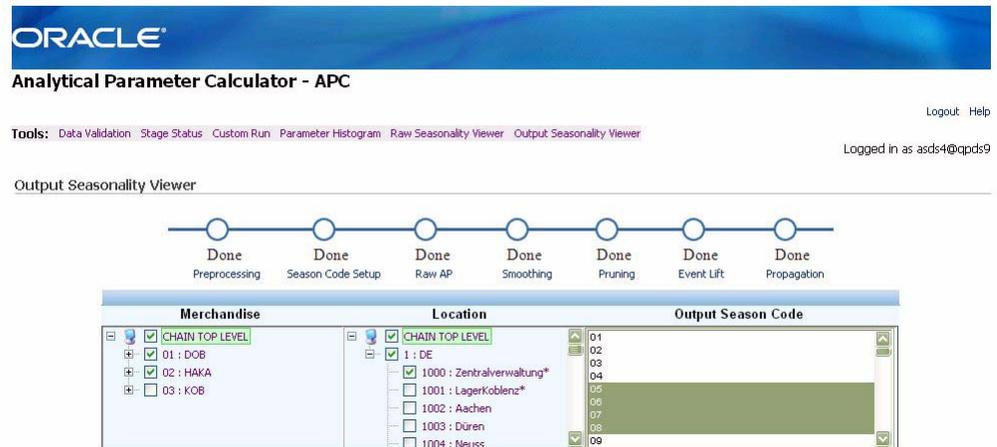
Use Reset All to clear all the fields and make new selections.

Output Seasonality Viewer

The Output Seasonality Viewer option provides a graph of the seasonality curves after the Output stage has been run.

Here is an example of the Output Seasonality options.

Figure 10–8 Output Seasonality Viewer Options

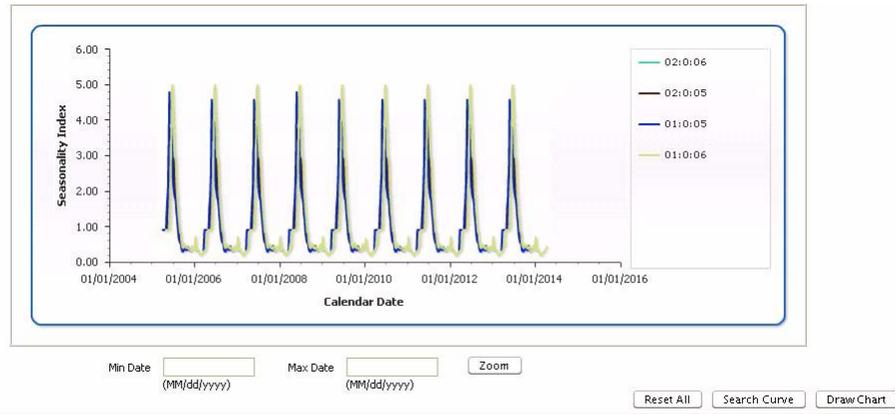


Use the topmost section to select the merchandise levels, location levels, and season codes you are interested in seeing graphed. Click Search Curve. You will see a list of the available seasonality curves.

To generate the graph, click the check boxes for the seasonality curves you want to display and click Draw Chart.

Here is an example of the Output Seasonality Viewer chart.

Figure 10–9



The list of available seasonality curves and their associated colors are listed in the top right corner of the bottom section of the screen. A graph is displayed for each seasonality curve listed. The values used in the x axis and the y axis are dynamic, depending on the data used to generate the graphs.

You can narrow the time range used in the x axis by entering the Minimum and Maximum dates you are interested in, using the format MM/DD/ YYYY), and clicking Zoom. The display changes to show the time range you specified. To change the date range, enter the new dates and click Zoom again.

Use Reset All to clear all the fields and make new selections.

Glossary

Aggregation

Combining data to a higher level in order to obtain more effective data that has a higher rate of sales.

Alpha

The learning rate. A large alpha places high weight on the last week. Alpha can be considered as the inverse of the number of weeks of sales to consider. For example, when considering ten weeks of sales, then $\alpha = 0.1$.

Attribute

Used to categorize an item's season, inventory flow, or..., and to distinguish between different selling patterns.

Attribute Mapping

Mapping the type of seasonality curve to the type of merchandise (indicated by the attribute for the merchandise). The two types of seasonality curves are Basic and By Start Date.

Analytical Services (AS)

The section of the retail business unit that performs the analytical work for an analytic implementation.

ASDS

The database schema used by APC.

Base Historical Period

The year-specific season code for each year-independent season code that is used to calculate the output demand parameters. For example, the base historical period for the season code January is January-2005.

Basic Season Code

A season code that does not have a start date or an end date. It is year-independent.

Catch-all Curve

This curve is defined at the highest merchandise/location level and is associated with a single season code that is mapped to all historical items.

Corrections Stage

One of the APC stages. It extends regular season code curves and calculates the event lift.

Data Sufficiency

Enough data for reasonably meaningful calculations.

Demand Model

It consists of a set of demand parameters that are combined to determine the modeled sales units for a given item/week.

Demand Parameters

A set of numeric values that are required for the calculation of forecast model values for the customer. Demand parameters include seasonality values, price elasticity, inventory effect parameters, store count effect parameters, and promotional lifts.

Depriced

Corrected value for sales based on price elasticity (price effect removed).

Effective End Date

The last day a markdown can be recommended.

Effective Start Date

The first day a markdown can be recommended.

Eligible Item

An item that meets the defined eligibility requirements. This is defined in the Pre-processing stage. Only eligible items can be used to generate demand parameters.

Eligible Week

Historical data that corresponds to a particular week for an eligible item. Only eligible weeks can be used to generate demand parameters.

Escalation Path

The order to use when searching through the merchandise levels and the location levels. The first level to be searched is always the top search level and the last level to be searched is always the bottom search level.

Filter

The process of removing historical data that should not be used in calculating demand parameters.

Filtered Eligible Item/Week

The eligible item/weeks that pass the following three filters:

- the ration of sales price to max ticket price is within the user-specified range
- the weeks of a particular item belong to the date range that corresponds to the user-specified min/max percent of cumulative sales units of the item
- the ratio of end-of-week inventory units on hand to the max end-of-week inventory units for that item is greater than or equal to the user-specified threshold.

Gamma

The value for the demand parameter price elasticity.

Historical Data

Past sales data that is used by AS to determine demand parameters.

Inventory Effect

Inventory effect is intended to approximate the effect of inventory depletion on the sales rate. As the inventory of an item depletes, it is possible for the sales rate to slow down. This can happen because the customer is unable to find the correct size or preferred color, for example. It can also happen because some stores stock out.

Inventory Ratio

The ratio of inventory at the end of the week to the maximum inventory of all weeks.

Item

A combination of merchandise and location nodes at a certain merchandise and location level. For example, possible items are Style/Region, SKU/Chain, or Chain/Chain.

Item Partition

A set of items for which the APC calculates a single set of demand parameters. The APC does not calculate demand parameters for a single item. Instead, the APC assigns demand parameters to a set of items. The APC divides the entire set of items in the historical data into partitions, and, for each partition, it calculates a single set of demand parameters for that partition. A single set of demand parameters consists of one seasonality curve and on value for each of the other demand parameters.

Level

One of the following:

- any element of the merchandise hierarchy or the location hierarchy
- any combination of levels in the individual hierarchies

Life Cycle

The time period during which an item is sold.

Lift

An increase in the sales for an item as a result of a promotion or a holiday sale.

Location Hierarchy

The levels or groupings of stores in your company. Typically the levels in location hierarchies are chain, region (or zone), and store

Lowest Pass Level

The merchandise/location level combination that corresponds to the lowest merchandise and location levels from the list of merchandise and location levels that are used to calculate demand parameters.

Merchandise Hierarchy

The levels or groupings of product in your company, typically extending from SKU or size at the lowest level to company at the highest.

Merchandise/Location Partition

A combination of the merchandise hierarchy node, the location hierarchy node, and the season code, used to create a grouping that is suitable for statistical analysis.

Moving Holiday

A moving holiday is defined as any holiday whose fiscal week can change over the course of multiple years, and whose presence causes a lift in sales. Examples include Labor Day and Thanksgiving.

A moving holiday's date is defined as the actual calendar date that the moving holiday occurs on. A moving holiday is also defined with a range of dates in which sales are affected by the holiday

Multi-cycle Curve

A multi-cycle curve contains multiple cycles of the seasonality pattern, one for each future year. A cycle is limited to 52 weeks.

Output Stage

One of the APC stages. It determines output parameters, sets values for alpha, and sets the escalation path.

Padding Curve

The time series of weekly sums of deprecised sales, normalized for weeks that belong to the user-specified fiscal year.

Pre-Processing Stage

One of the APC stages. It is used for the initial filtering of bad weeks of data and bad items.

Price Effect

The price effect is a function of the relative price, which is computed as $\text{Relative price} = \text{salesPrice} / \text{fullPrice}$. The relative price is combined with input and configuration parameters to determine the price effect.

Price Elasticity

A measure of the increase in sales as the price decreases. Some items, such as Halloween candy, do not have price elasticity because demand is not determined by price.

Propagation Stage

One of the APC stages. This stage is used to remove moving holiday lifts and promotional lifts from seasonality curves.

Pruning Stage

One of the APC stages. It removes the demand parameters and seasonality curves that are unreliable.

Raw

Before pruning.

Raw AP Stage

One of the APC stages. This stage calculates the demand parameters.

Regular Season Code

A season code that has a start date and an end date. It is year-dependent.

Relative Price

relative price = sales price / full price.

Reliable Partition

A partition that has passed the pruning stage.

Richness

The number of items that are mapped, using the escalation logic defined in the search tables, to each merchandise level. Richness is a measure of the hierarchy levels at which items are mapped to parameters. Richness can change after seasonality curves are filtered out.

Sales Units

The number of units sold for a week.

Season Code

The item attribute that represents an item's inventory flow. Season codes can be monthly, quarterly (for example, Spring or Summer), or based on a client-provided merchandise attribute.

Two types of season code exist within APC: year-dependent season codes and year-independent season codes.

A year-dependent season code is associated with an item that began or was selling during a particular fiscal year (for example, January 2004 or the first quarter of 2005).

A year-independent season code is associated with an item that began or was selling during a time period that is not identified with a particular year (for example, January or first quarter).

Season Code Setup Stage

One of the APC stages. It defines season codes and maps season codes to items.

Seasonality

Seasonal variations in the demand for merchandise.

Seasonality Correlation

A calculation of the year-to-year correlation for different years of data.

Single Cycle Curve

A single-cycle is specific to a future year and contains only one cycle. A cycle can be longer than 52 weeks.

Smoothing Stage

One of the APC stages. It calculates the seasonality curve reliability that is used to prune unreliable seasonality curves during the Pruning stage.

Stage

Data processing in APC consists of multiple stages that are executed sequentially. The input and output data for each stage persists in the database.

Standard Interface

The specification for the formatting of the historical data feeds.

Start Date

The earliest calendar date that the item started selling. The start date is associated with a year-dependent season code only.

Store Count Effect

The reduction in the relative strength of sales due to size/store level stockouts.

Store Effect

The number of unique stores for a given item/week that either have positive sales units or positive end-of-week inventory units for that item.