# Lesson 2: Filters

In the previous lesson, you learned to create simple analyses by selecting existing columns from a subject area, and you created your own custom data columns as well. You also learned the simplest method of creating a filter (manual selection). In this lesson, you'll learn additional techniques for creating analysis filters and custom formulas. At the conclusion of this lesson, you will have learned the basic techniques for creating filtered Answers analyses, and will be ready to start creating the different views of the analysis data.

## *Exercise 2a: Filtering using Repository Variables – part 1*

In a previous exercise, you manually selected values of Fiscal Month and saved them as the **Current YTD Months** filter. In this exercise, you will create and save a filter in which the appropriate values of Fiscal Month will be **dynamically** determined.

1. Click the New Analysis  icon to create a new Answers analysis from the **Training** subject area.

2. In the Selection panel, drill on the **Time** folder and double-click the **Fiscal Month** column to add it to the analysis.

3. Click the filter icon for the **Fiscal Month** column.

This filter will reference two **variables** that have been defined in the OBIEE Repository. One holds the value of the first Fiscal Month of the current year. The other holds the value of the most recently loaded Fiscal Month. A **variable** is a single-cell data container that holds a date, a character string, or a number.

4. Select **is between** as the **Operator**.

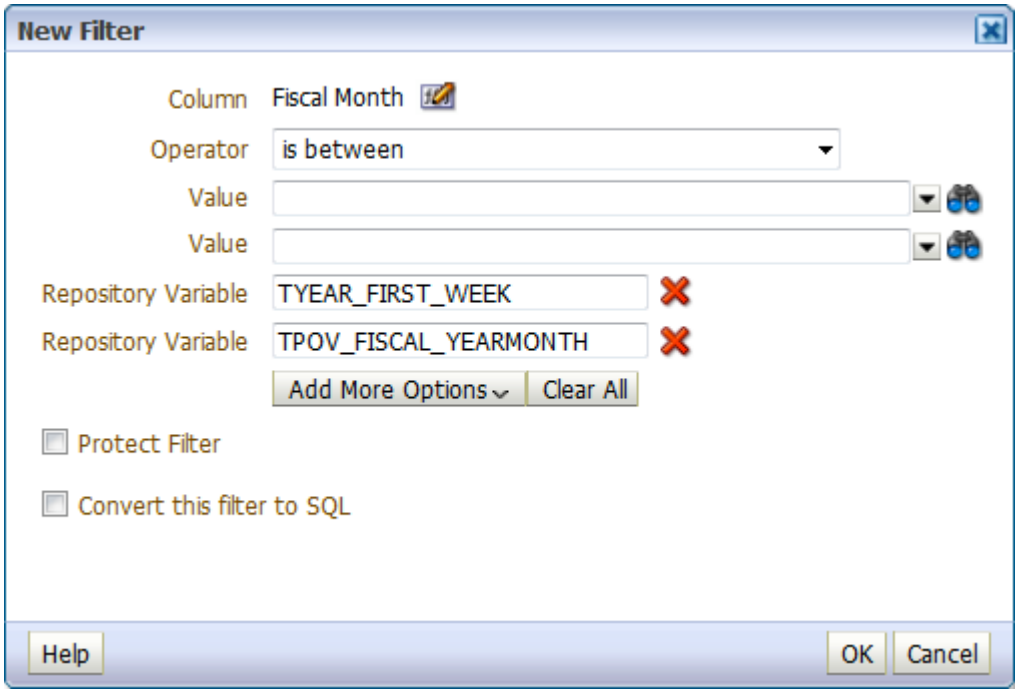
5. Click **Add More Options > Repository Variable** below.

6. In the Repository Variable field, type **TYEAR_FIRST_WEEK**, which is the name of the first repository variable.

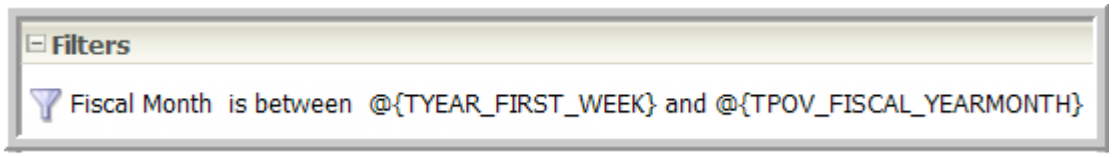
7. Click the **Add More Options > Repository Variable** button again, and type **TPOV_FISCAL_YEARMONTH into the new repository variable field.**

**Note: The 'T' in front of repository variable names is for the Training Subject Area**.

Your screen should look like this:




These two **Repository Variables** are automatically updated by the OBIEE Server every night at midnight. They contain dates, as does the Fiscal Month column. Click **OK** to close the dialog.




***NOTE**: There is no currently not a dropdown list from which to select values of variables. Repository variable names are not case-sensitive, but the generally accepted standard standard for repository developers is to use UPPER_CASE_NAMES.*

8. Click the **Save Filter** icon, and save the filter using the same name that you used earlier, **Current YTD Months**. You may simply click that name in the list of filters and click **OK.**

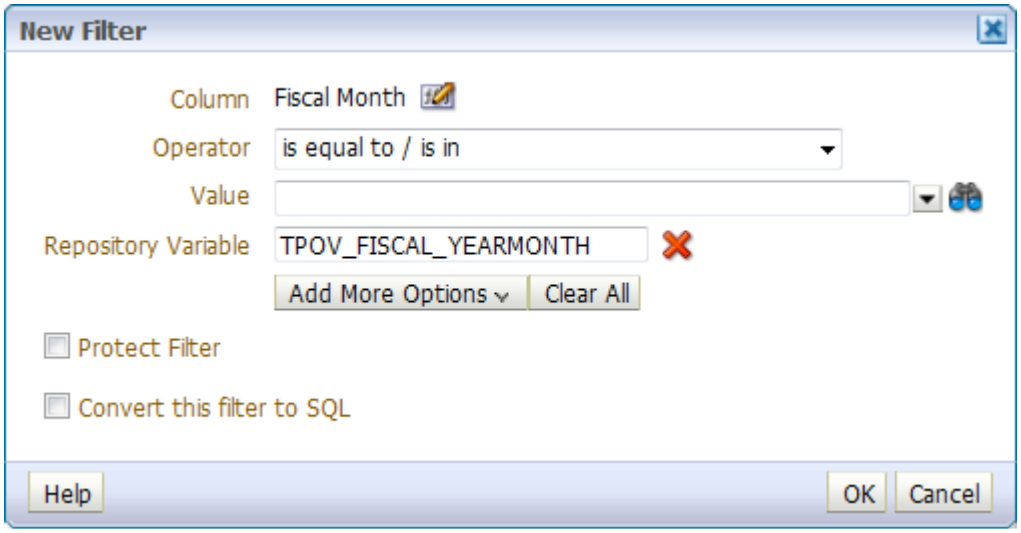
## *Exercise 2a: Filtering using Repository Variables – part 2*

Similar to the YTD range filter that we created in the previous exercise, we might also want to create a filter that contains a pointer to the "most recently closed" Fiscal Month. In this exercise, we'll create such a filter.

1. It isn't necessary to create a filter as part of an analysis. Click **New > Filter**, and choose the **Training** subject area.

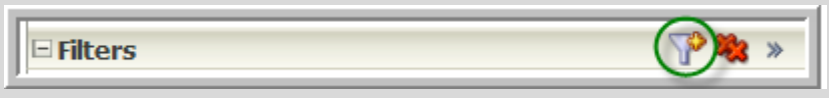
2. In the Selection panel, drill on the **Time** folder and double-click the **Fiscal Month** column to add it to the filter.

3. Select the **is equal to / is in** operator, add a repository variable field as described in the previous exercise, and enter **TPOV_FISCAL_YEARMONTH** as the Repository Variable name, as shown here:




4. Click **OK**, then save the filter under **My Folders** with the name **Current Fiscal Month**.

**Helpful Hint:** We do not need to add a particular column to the analysis in order to create a filter for that column. When creating an analysis, we can click the Create Filter icon, located on the Filters header, as shown here,

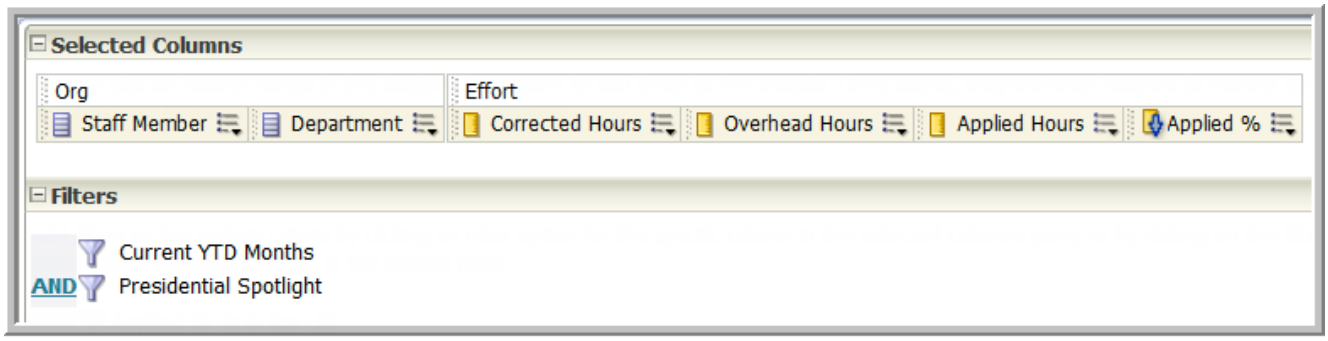



and choose from all columns in the subject area.

## *Exercise 2b: Creating Top/Bottom filters*

In this exercise, you'll find the 10 values of Staff Member with the highest Current YTD Months Applied %.

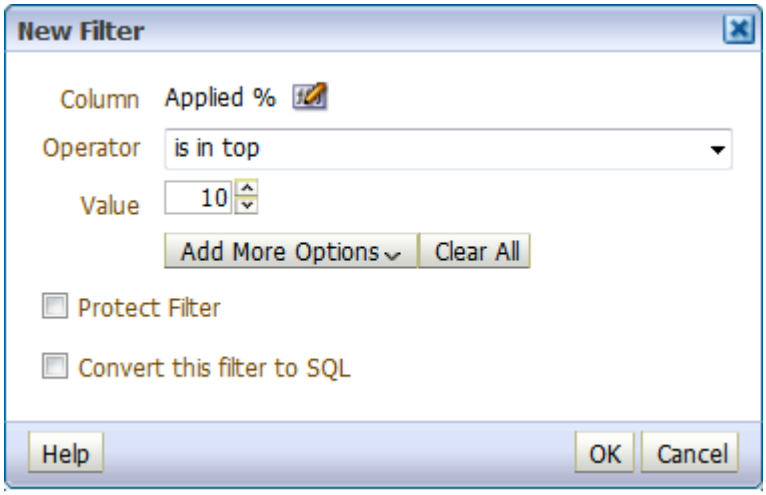
1. Create the following analysis. Note the two filters, and the descending sort on the last column.



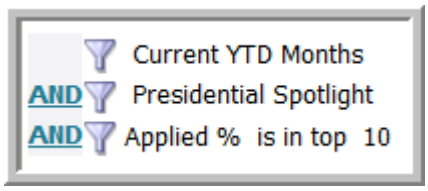

2. Save the report as **Top 10 Analysis**.

3. Click the **Filter** icon for the **Applied %** column.

4. In the Create/Edit Filter dialog, select **is in top** as the Operator, and enter a value of **10**.




5. Your filters should look like this:



6. View the Table of results.

| Staff Member | Department | Corrected Hours | Overhead Hours | Applied Hours | Applied % |
|---|---|---|---|---|---|
| Liza Haiyang | Recruitment & Employment Ctr | 1,004 | 87 | 917 | 91 |
| Stacey Teresa | Graduate School Administration | 979 | 146 | 833 | 85 |
| Nicolien Ethan | Recruitment & Employment Ctr | 972 | 177 | 795 | 82 |
| Dwane Theodore | Graduate School Administration | 932 | 178 | 754 | 81 |
| Karthik Shannon | HR Info Systems & Records Adm | 772 | 158 | 614 | 80 |
| Santo Anitra | Office of Human Resources - VP | 900 | 187 | 713 | 79 |
| Sarah Ryan | College of Arts and Sciences | 993 | 207 | 786 | 79 |
| Monica Peter | Office of Human Resources - VP | 465 | 99 | 366 | 79 |
| Amy James | Graduate School Administration | 897 | 193 | 704 | 79 |
| Stacey Fred | Graduate School Administration | 821 | 184 | 637 | 78 |

7. Resave the **Top 10** analysis.

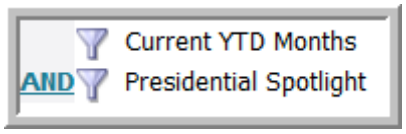
Next Fiscal Month, and in every subsequent Fiscal Month, this analysis will return a different group of 10 Staff Members. When the repository variables are automatically updated at the end of each Fiscal Month, all analyses which use those variables will automatically display new data the next time they're viewed.

## *Exercise 2c: Grouping filters using AND/OR conditions*

Frequently, filters may need to be applied in a specific order, or grouped together so that specific OR or AND conditional groupings can be handled. OBIEE allows the grouping of filters in that manner.

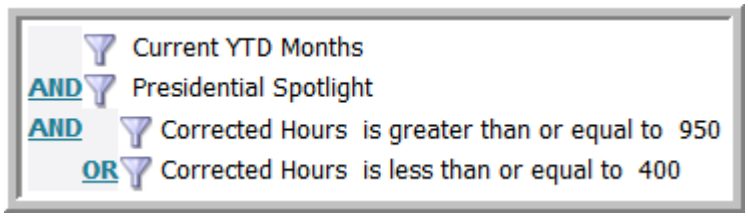
1. Open (if necessary) the **Top 10 Analysis** and use the Save As icon (to the right of the Save icon) to save it under the new name **Filter Groupings.**

2. Remove the filter for the Applied % column. The Filters should look like this:




3. Create **two** filters for the **Corrected Hours** column. We're interested in finding the Staff Members for whom the YTD Corrected Hours were greater than or equal to 950 or less than or equal to 400. Create the two filters so that the Filters section of the Criteria tab looks like this:

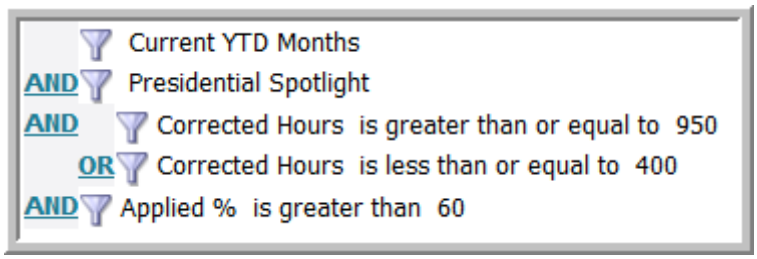

4. Obviously, this filter would never return any rows. As you see, the default operation for multiple filter conditions is AND. Click the last **AND** link, to change it to **OR.**

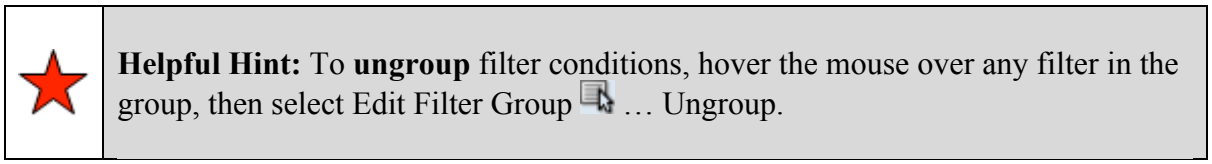



When an analysis contains three or more filter conditions, the AND operator not only gets changed to an OR, but the filter condition that you clicked also gets **grouped with the filter condition immediately ABOVE it**. Notice the indentation of the two Corrected Hours filters. This indentation indicates that the two filter conditions are grouped together.

5. Now that we've selected our **outlier** Staff Members, we'd like to further limit the returned rows to only those in which the Applied % is greater than 60%. Click the **Filter** icon for the **Applied %** column, and create an **is greater than 60** filter.

6. The result of adding this filter looks like this.




7. View the results in the Table view:

| Staff Member | Department | Corrected Hours | Overhead Hours | Applied Hours | Applied % |
|---|---|---|---|---|---|
| Liza Haiyang | Recruitment & Employment Ctr | 1,004 | 87 | 917 | 91 |
| Stacey Teresa | Graduate School Administration | 979 | 146 | 833 | 85 |
| Nicolien Ethan | Recruitment & Employment Ctr | 972 | 177 | 795 | 82 |
| Sarah Ryan | College of Arts and Sciences | 993 | 207 | 786 | 79 |
| Stefanie Michelle | HR Info Systems & Records Adm | 1,016 | 234 | 782 | 77 |
| Nicolas Eunmi | HR Info Systems & Records Adm | 977 | 276 | 701 | 72 |
| Jeffry Colleen | Office of Human Resources - VP | 391 | 131 | 260 | 66 |
| Tetsuko Sidney | Recruitment & Employment Ctr | 978 | 348 | 630 | 64 |
| Steven David | Graduate School Administration | 987 | 366 | 621 | 63 |

In a later lesson, we'll learn how to use Variables instead of hard-coded values for the two Corrected Hours filters.

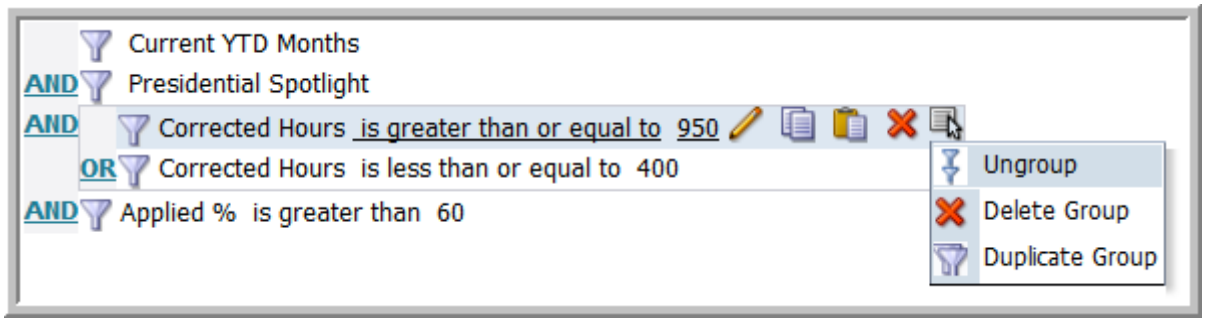
8. Resave the **Filter Groupings** analysis.

## *Exercise 2d: Filtering using SQL*

There may be circumstances under which you simply cannot use the mouse-click functionality of OBIEE to create a filter that you need. In those situations, you can use a SQL expression as the filter condition. In this exercise, we create just such a filter.

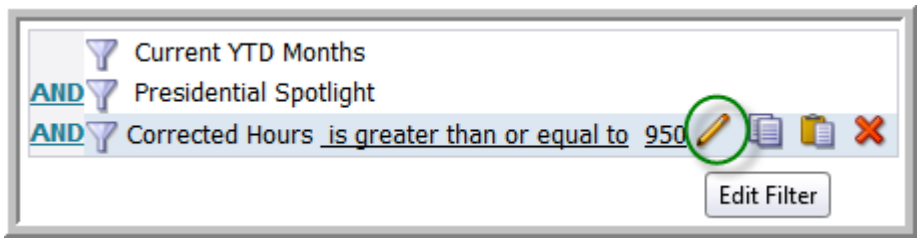
1. Starting with the **Filter Groupings** analysis completed in the previous exercise, go to the **Criteria** tab

2. Hover the mouse over the two grouped Corrected Hours filters, then select Edit Filter Group … Ungroup.

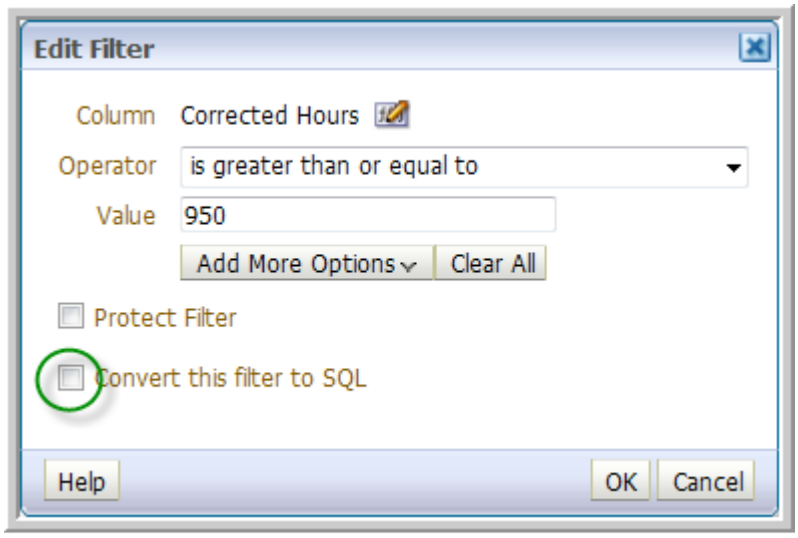



3. Remove the filter on Applied % as well as the second filter on Corrected Hours (less than or equal to 400). These filter criteria will remain:

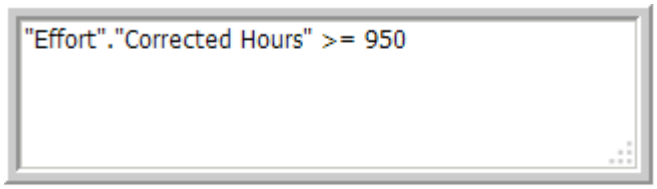
4. Select **Edit Filter** for the last filter condition (Corrected Hours >= 950)



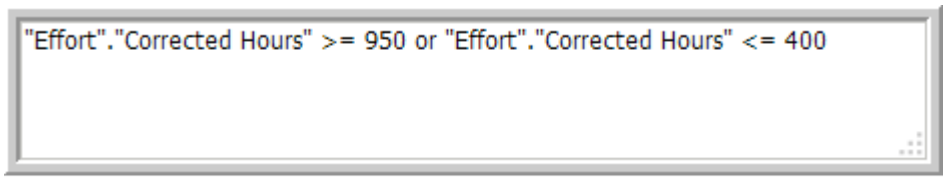

5. Select the **Convert this filter to SQL** and click **OK**.



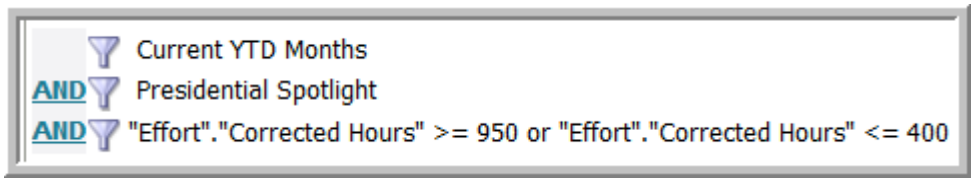

6. The results of converting the filter to SQL look like this. Do NOT click OK on this screen yet.



7. In that same box, type the word **OR** after the existing text**,** then either type or copy/paste from the existing SQL so that you end up with this. Click **OK**.




8. At this point, you end up with a set of filters that looks like this:



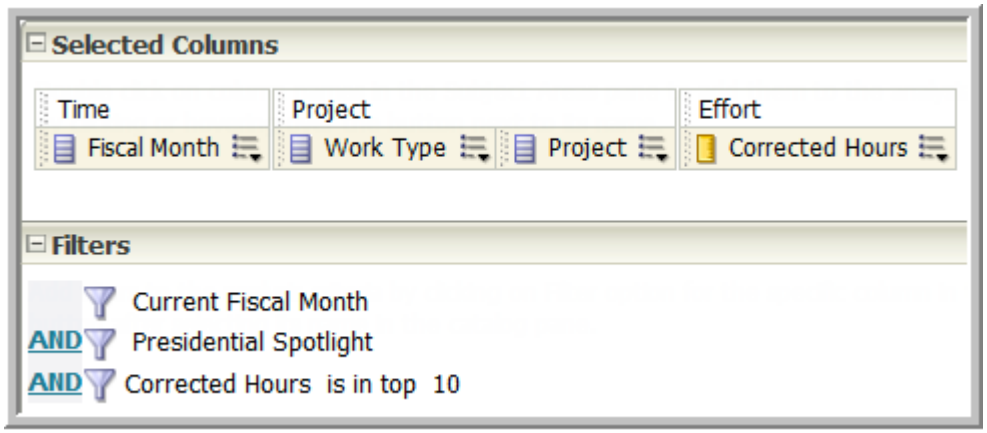

9. Save the analysis as **SQL Filter**.

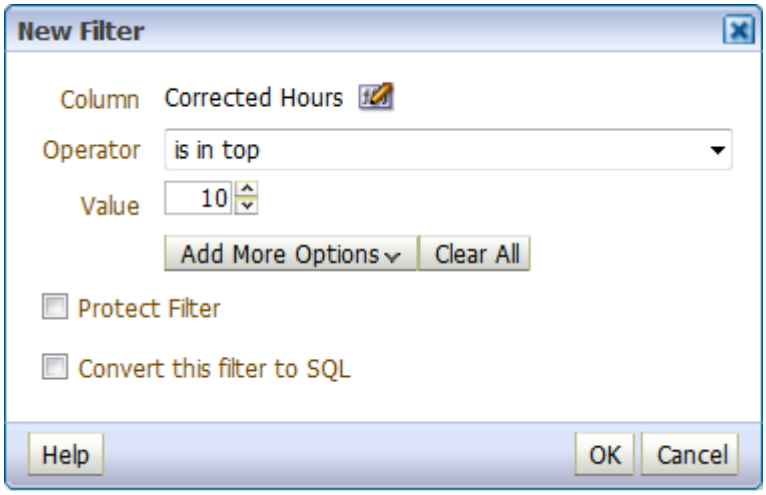
As you might imagine, you can use any sort of complex SQL statement that you need. Just start with any ordinary filter condition, then change it to suit your needs. Note that the table and column references in the filter are references to the tables and columns in the selected Subject Area in Answers.

## *Exercise 2e: Filtering based on a saved Answers analysis*

Suppose you wanted to find the 10 Projects with the greatest Corrected Hours for last Fiscal Month, and then view the Corrected Hours for those same **Projects** for the Current YTD Months period. This is accomplished by writing two analyses, in which the first analysis serves as the filter for the second analysis.

1. Create a new Answers analysis as shown here. (Remember: **Current Fiscal Month** and **Presidential Spotlight** are existing saved filters.)



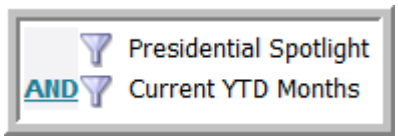




2. Click the **Results** tab and notice which Projects are selected. Close the preview window.

3. Save the analysis as **Current Top 10 Projects.**

4. Now create the second analysis. Start with the current analysis (Current Top 10 Projects) and save it under a new name, **Filter On Other Analysis**.

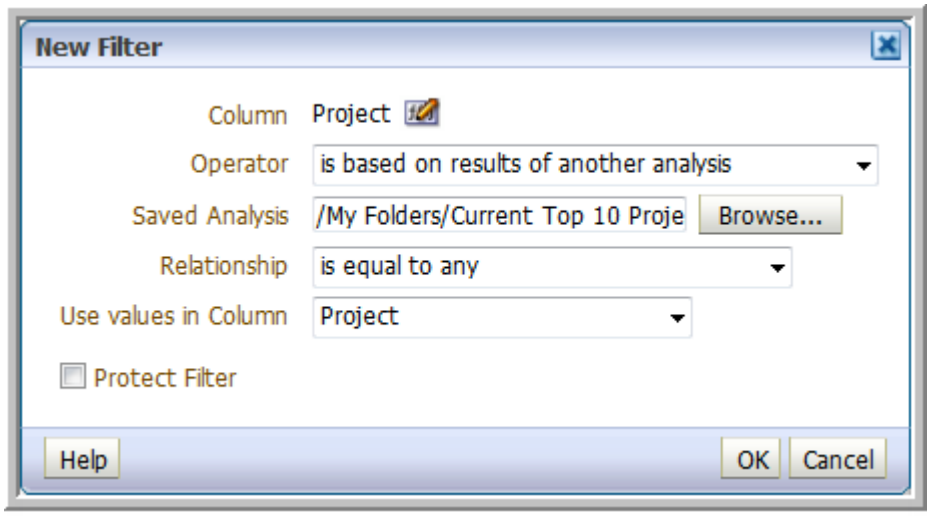
5. We want to keep all of the existing columns, but we need a different set of filters. Delete and add filters as needed so that you have these two filters:



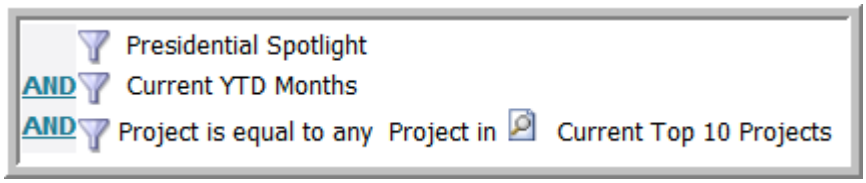

6. So, which Projects do we want to see? We're interested in the 10 Projects that were selected in our **Current Top 10 Projects** analysis. Start a filter for the **Project** column.

7. The operator for this filter will be the last option in the dropdown list, **is based on results of another analysis.**

8. Browse to, and select, the **Current Top 10 Projects** analysis as shown. If **Use Values in Column** defaults to a different field, change to Project as shown below.



9. The finished filter set will look like this:




10. Display the Results tab. You should see Current YTD Months of Corrected Hours for the same Projects that were selected as the Current Top 10 Projects.

| Fiscal Month | Work Type | Project | Corrected Hours |
|---|---|---|---|
| 201001 | Non Billable | Leave | 2,565 |
| | | Non Billable Time - Admin Work, Desktop Supt, Town Mtngs, etc. | 1,044 |
| | | Non Billable Time - Training & Conf (ELP, CPMM) | 310 |
| | Operational Improvement | PS Op Improvement - Payroll | 34 |
| | | Pinnacle Operational Improvements (including Special Requests) | 233 |
| | | SP - COG Facilities Space Inventory System Development | 401 |
| | Operational Support | Accounting - Operational Support | 172 |
| | | Blackboard Operational Support | 131 |
| | | Database Infrastructure - Operational Support | 188 |
| | | Hosting - CMS Hosting Service | 129 |
| 201002 | Non Billable | Leave | 2,723 |

11. Save the analysis as **Filter On Other Analysis**.

## *Exercise 2f: Filtering Within an Answers Column Formula*

Let's suppose that you have a very simple report that looks like this:

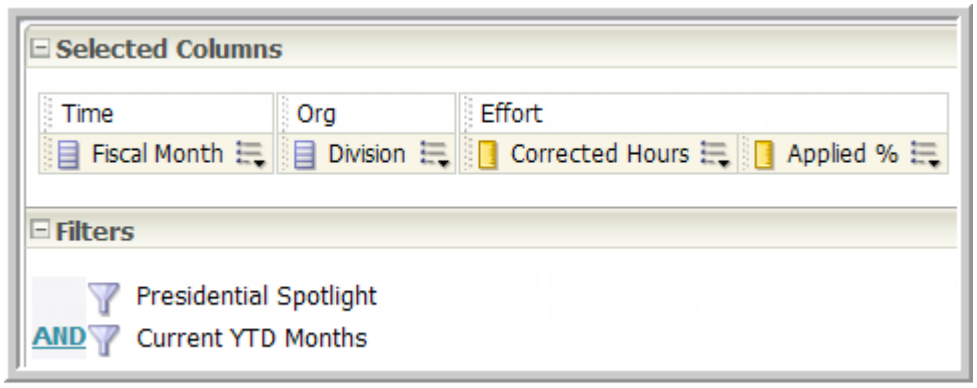
| Fiscal Month | Division | Corrected Hours | Applied % |
|---|---|---|---|
| 201001 | Arts & Sciences | 2,339 | 62 |
| | Graduate School | 3,380 | 51 |
| | Office of Human Resources | 6,175 | 60 |
| 201002 | Arts & Sciences | 2,270 | 62 |
| | Graduate School | 3,489 | 55 |
| | Office of Human Resources | 5,792 | 64 |
| 201003 | Arts & Sciences | 1,870 | 53 |
| | Graduate School | 2,685 | 61 |
| | Office of Human Resources | 4,570 | 67 |
| 201004 | Arts & Sciences | 2,244 | 67 |
| | Graduate School | 3,241 | 67 |
| | Office of Human Resources | 5,629 | 70 |
| 201005 | Arts & Sciences | 1,892 | 54 |
| | Graduate School | 2,607 | 54 |
| | Office of Human Resources | 4,735 | 55 |
| 201006 | Arts & Sciences | 56 | 39 |
| | Graduate School | 51 | 76 |
| | Office of Human Resources | 301 | 56 |

Let's further suppose that you would like to see the report like this in the Table view:

| Time | Arts & Sciences | | Office of Human Resources | | Graduate School | |
|---|---|---|---|---|---|---|
| Fiscal Month | Corrected Hours | Applied % | Applied % | Corrected Hours | Corrected Hours | Applied % |
| 201001 | 2,339 | 61.6% | 60.5% | 6,175 | 3,380 | 51.1% |
| 201002 | 2,270 | 61.9% | 63.9% | 5,792 | 3,489 | 55.2% |
| 201003 | 1,870 | 52.6% | 66.6% | 4,570 | 2,685 | 61.3% |
| 201004 | 2,244 | 67.1% | 70.2% | 5,629 | 3,241 | 66.8% |
| 201005 | 1,892 | 54.4% | 55.4% | 4,735 | 2,607 | 54.2% |
| 201006 | 56 | 39.5% | 56.2% | 301 | 51 | 76.4% |

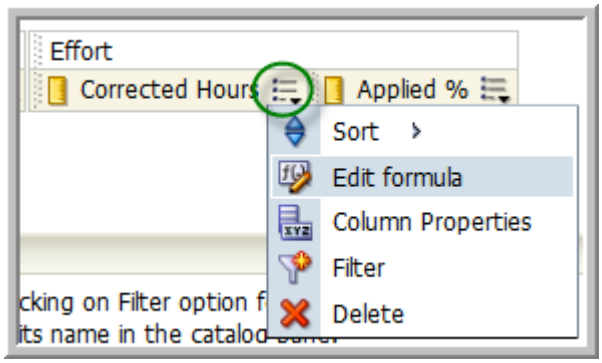
Although the above view is **very** easy to produce using a Pivot Table, it's not directly available in the Table. However, it can be accomplished using **column-based filters**.

1. Create this new analysis:

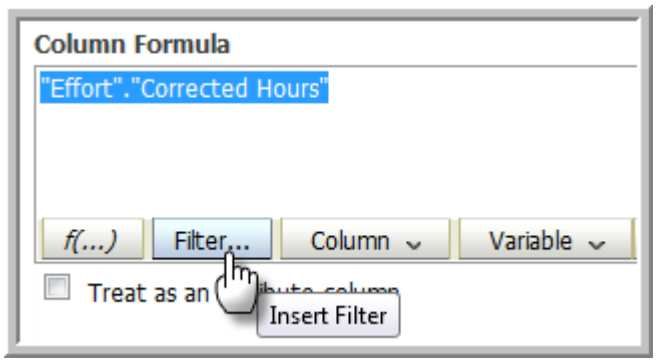



In these next steps, we'll convert the data columns so that they only return information about the Arts & Sciences Division.

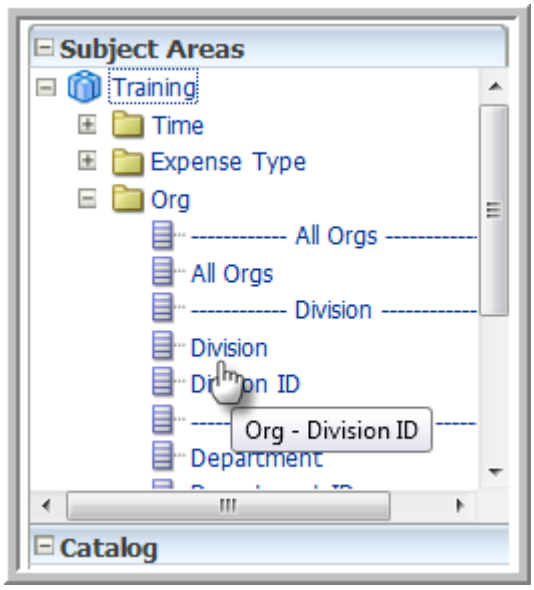
2. Return to the Criteria tab and modify the formula for the Corrected Hours column.



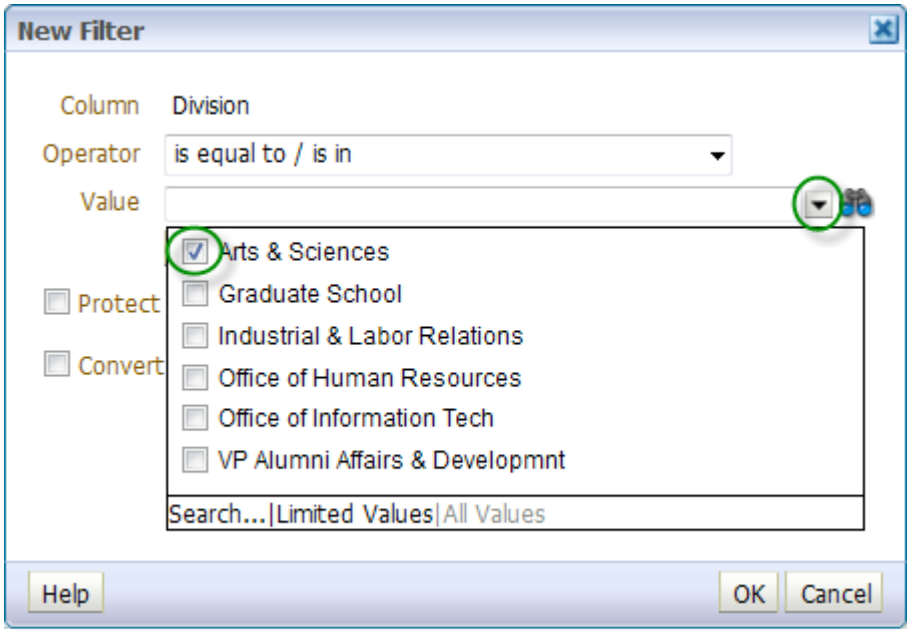
3. With the formula highlighted as shown below, click the **Filter** (Insert Filter) button on the edit screen.




4. With the **Insert Filter** dialog displayed, double-click Division from the selection panel.

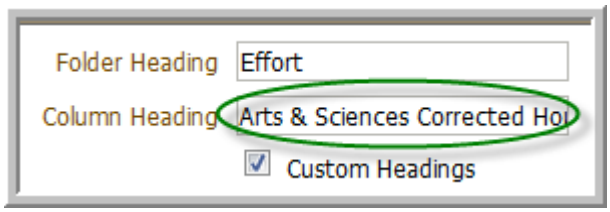


5. On the Create/Edit Filter dialog, select Arts & Sciences from the Value dropdown.




6. Click **OK** (twice) to close the Insert Filter dialog.

7. The filtered column formula should look like this. Change the Custom Heading to **Arts & Sciences Corrected Hours** and click OK.




8. Repeat the same process for the **Applied %** column.

9. Remove the **Division** column from the analysis.

10. Confirm that the results look like this:

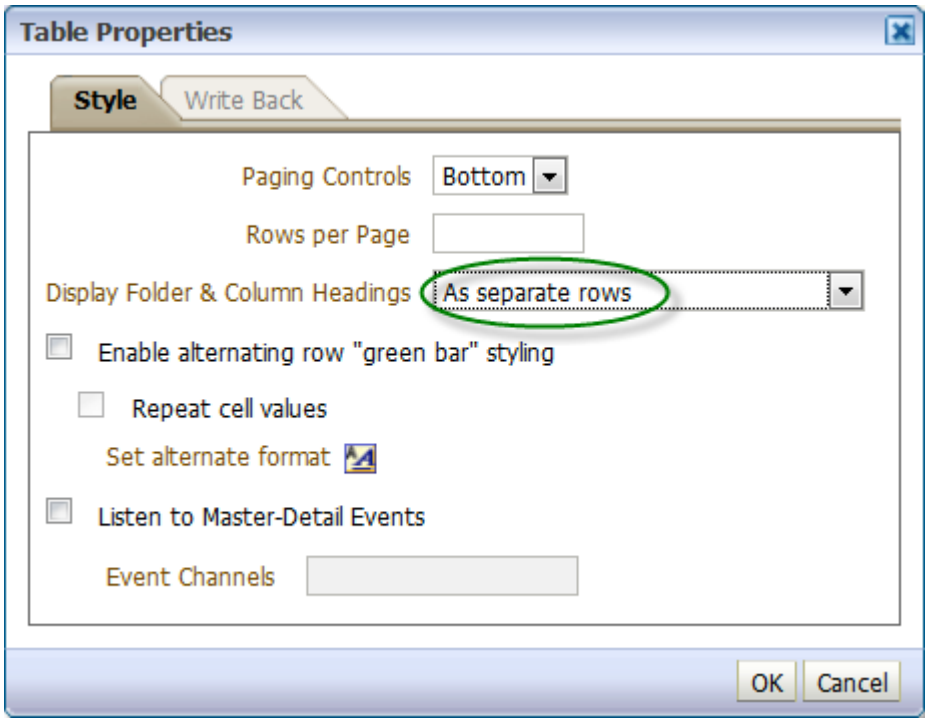
| Fiscal Month | Arts & Sciences Corrected Hours | Arts & Sciences Applied % |
|---|---|---|
| 201001 | 2,339 | 62 |
| 201002 | 2,270 | 62 |
| 201003 | 1,870 | 53 |
| 201004 | 2,244 | 67 |
| 201005 | 1,892 | 54 |
| 201006 | 56 | 39 |

The column headings are too wide, and there's no way to force them to wrap. But we **can** use some features of the table to help us adjust the column widths. In an earlier lesson, we learned how to edit a view (in this case, the "table" view). Let's return to the table editor.

11. On the Results tab, use one of the Edit icons (the pencil) to open the Table for editing.

12. In OBIEE 11g, any time we want to adjust the properties of a view, we're going to look in the toolbar for an icon that has **xyz** on it, like the one circled in this screenshot. Click on that **Table View Properties** icon now.

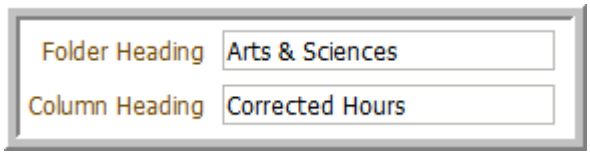
13. The default setting for **Display Column & Table Headings** is 'Only column headings'. Table headings aren't typically shown in the Table view. Change that setting to 'As separate rows'.




14. Click **Done** (top right) to indicate that you are finished editing the view.

**15.** Now let's change the table and column headings for each of the data columns in our report. Return to the Criteria tab, and edit the formula for the first data column, **Arts & Sciences - Corrected Hours.**

16. Change the **Folder Heading** to Arts & Sciences, and the Column Heading to Corrected Hours. Click OK.




17. Repeat the previous step for the Applied % column.

18. View the results.

| Time | Arts & Sciences | |
|---|---|---|
| Fiscal Month | Corrected Hours | Applied % |
| 201001 | 2,339 | 62 |
| 201002 | 2,270 | 62 |
| 201003 | 1,870 | 53 |
| 201004 | 2,244 | 67 |
| 201005 | 1,892 | 54 |
| 201006 | 56 | 39 |

19. Repeat the above procedure to create the two similar Office of Human Resources columns and the two Graduate School columns, with their associated table names and column names.

20. Display all of the Applied % columns with 1 decimal place and a percent sign, and display all of the Corrected Hours columns with commas, no decimals, and no dollar sign.

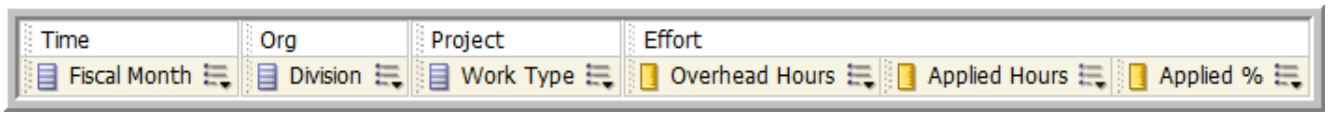
| Time | Arts & Sciences | | Office of Human Resources | | Graduate School | |
|---|---|---|---|---|---|---|
| Fiscal Month | Corrected Hours | Applied % | Applied % | Corrected Hours | Corrected Hours | Applied % |
| 201001 | 2,339 | 61.6% | 60.5% | 6,175 | 3,380 | 51.1% |
| 201002 | 2,270 | 61.9% | 63.9% | 5,792 | 3,489 | 55.2% |
| 201003 | 1,870 | 52.6% | 66.6% | 4,570 | 2,685 | 61.3% |
| 201004 | 2,244 | 67.1% | 70.2% | 5,629 | 3,241 | 66.8% |
| 201005 | 1,892 | 54.4% | 55.4% | 4,735 | 2,607 | 54.2% |
| 201006 | 56 | 39.5% | 56.2% | 301 | 51 | 76.4% |

21. Save the analysis as **Column Filters**. We'll use this analysis in a later exercise.

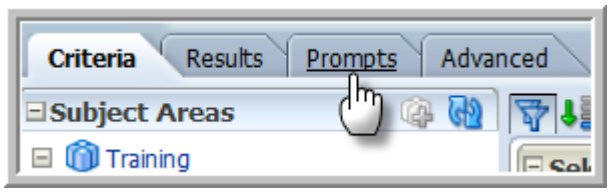
## *Exercise 2g: Column Filter Prompts*

Frequently, the developer of an analysis might wish to allow a user to select a set of filter conditions at run time, rather than hard-coding the filter conditions into the analysis. In addition, to avoid the unnecessary overhead of running large, unfiltered analyses, we might like to require the user to select one or more filter conditions before the analysis is executed. We can accomplish that through the use of a **Column Prompt**.

1. Create this simple, unfiltered analysis in Answers, but do not display its results:

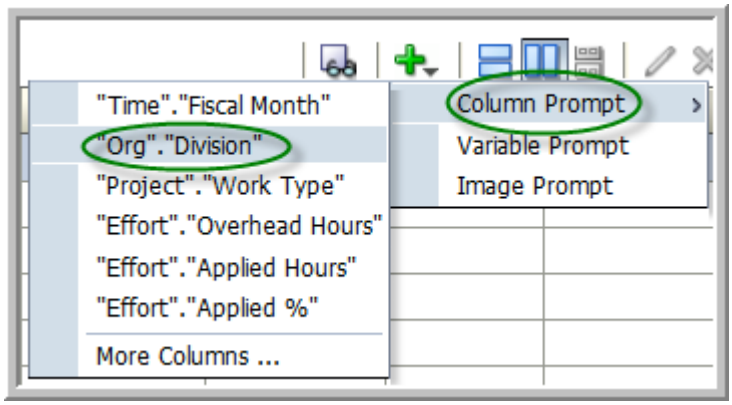



2. Click the Prompts tab.

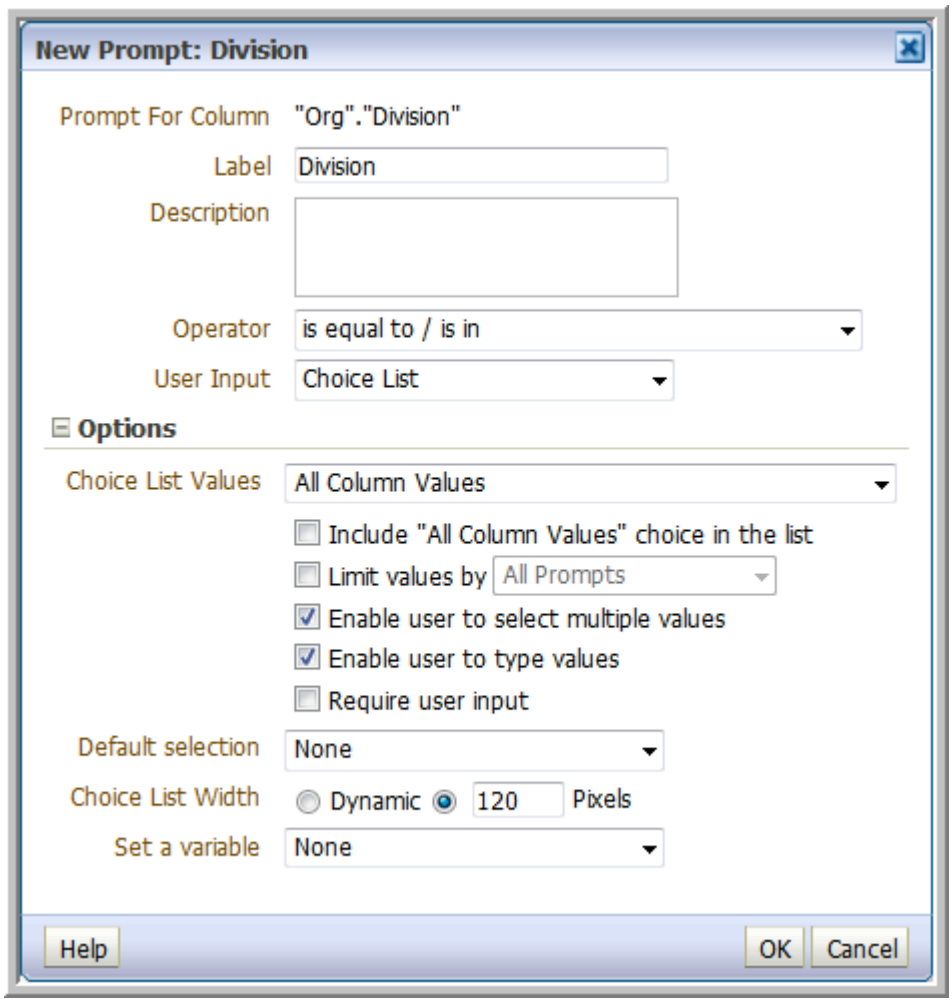



3. In OBIEE 11g, you'll look for one of two symbols when creating a new object. One is a yellow plus sign with an orange surround, like the one on this New View icon:  The other is a green plus sign that you see on this screen. Click that icon now.

4. From the dropdown menu, choose **Column Prompt … Org.Divison**.

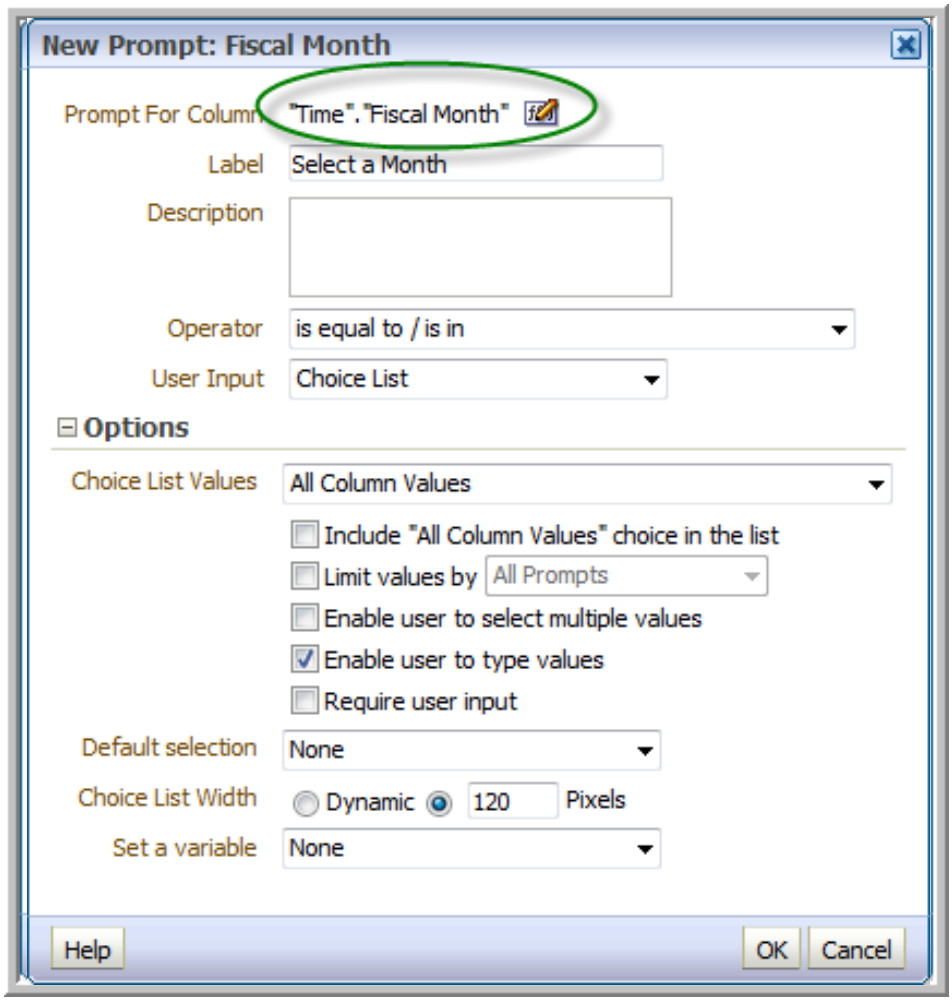


5. Complete the Column Filter Prompt Properties dialog box as shown here, and click **OK**. Some of the options are described below the screenshot.




A. User Input: The available choices may be presented as a simple dropdown list, a series of check boxes, radio buttons, and so forth. Leave this setting at **Choice List.**
B. If the **Enable user to select multiple values** box is left unchecked, then only a single value may be selected at any given time. If this box is checked, then the user may select multiple values from the selection list.
C. **Include "All Column Values" choice in the list** permits the user to select all values with a single click.
D. The Default Selection option allows the analysis developer to assign a default value that appears initially when the analysis is displayed.

6. Create a second Column Filter Prompt, starting with the green plus sign, as shown here:




Notice that for this prompt, we want the user to select only one value.

7. After completing the second Column Filter Prompt, notice that multiple prompts can be rearranged using the up and down arrow icons found at the right side of the prompt list when a prompt entry is highlighted.

8. Click the Dashboard Preview icon to show how the analysis will be rendered on a dashboard, or when invoked for execution from a web address link.

9. Make a selection from each of the prompts, and click Apply to see how a Column Prompt works to filter an analysis prior to its display.

10. Save the analysis as **Column Filter Prompts**.