Cal Answers
Analysis Training
Part III

Advanced OBIEE - Dashboard Reports

University of California, Berkeley
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To report any problems with the Cal Answers Portal, Reports, or Dashboards:

• Send an e-mail to calanswers-help@berkeley.edu
  Or
• Call the Help Desk at 642-8500 (press option 4, then 2), Monday – Friday, 8:00am – 5:00pm
Overview

Cal Answers is the new reporting environment for UC Berkeley’s Enterprise Data Warehouse (EDW). It currently uses Oracle Business Intelligence Enterprise Edition (OBIEE) version 11g software.

This three-part training course will deal with using OBIEE, including how to write your own queries and create your own dashboard reports. Specifically, the sessions will cover:

1. Creating Analyses in OBIEE
2. Viewing Analysis Results in OBIEE
3. Advanced OBIEE – Dashboard Reports

Remember How to Create a Query?

Clicking either “New > Analysis” or “Create… > Analysis,” and then choosing a data subject area will start the OBIEE ad hoc query tool:

The various fields available in a given subject area are stored in an expandable/collapsible tree. Click the plus signs (+) to expand a branch, and the minus signs (-) to collapse it. To bring a column into your query, either double-click it or drag it over into the “Selected Columns” area.
Create a Query to Use in This Class

For this class, we’re going to build a personal dashboard that shows, in one report, degree recipient counts for each level of degree awarded by the college/school of your choice, by either department (as the default) or gender, for any academic years since 2000-01 that the user selects. It should be able to display the data either as a pivot table (the default) or as a chart if the user chooses.

The first step is to create the query that retrieves this data. I’ll use the College of Chemistry as an example, but you can use any college you want. At this point, I’ll also just pull the most recent five years. Using the “Student Counts – Degrees” subject area, your query should look something like this:

If you’d like to verify that you’re getting the correct numbers, you can compare your query results to one of the Cal Answers dashboard reports showing degree data.

Remember How to Work with a Compound Layout?

To add a new view to a compound layout, use the “New View” toolbar button at the top of the layout screen.

Eight of the most common types of views are shown directly: title, table, pivot table, graph, gauge, funnel, map, and filters. You can also choose from nine additional views on the “Other Views” submenu.

Depending on which “New View” toolbar button you choose (remember there’s another one on the “Views” pane at the bottom left), OBIEE will either just add the view to your compound layout, or it will create the view without adding it.

Create a Pivot Table to Use in This Class

The next step is to create a pivot table for use in the compound layout that will comprise your dashboard report. You should also change your compound layout so that it only has a title and your new pivot table.
The compound layout should look something like this when you’re finished:

Create a Chart to Use in This Class
Although you won’t add it to the compound layout, you also need to create a chart of the data, so that users can switch back and forth between the pivot table and chart views. Here’s the one that I added:
View Selector and Column Selector Views

Now would be a good time to save your query (which also saves all result views that you might have defined), if you haven’t already done so.

As you might recall from the last class, there are two commonly-used result views that we haven’t covered yet. These are:

- View Selector view, which lets the user choose different ways of seeing the data (all of which you’ve defined ahead of time);
- Column Selector view, which lets the user choose which database fields appear in the results.

View Selector View

A view selector view lets the user choose between alternate (predefined) views of the data. In this case, we’ll let users decide if they want to see the data as a pivot table or as a chart.

To add a new view selector to your compound layout, use one of the “New View” toolbar buttons and look under “Other Views.” Choosing “View Selector” will either add an empty view to the compound layout, or just open the view’s editor directly.

View Selector Editor

The View Selector editor lets you define which views from which you want the user to be able to select. The various options here include:

- **Caption** – The text that will appear next to the view selector dropdown;
- **Caption Position** – Where the caption will appear, relative to the dropdown;
- **Available Views/Views Included** – Which views will appear in the dropdown; note that you can rename these;
- **Display Results** – What everything will look like.

In this case, we want to include the pivot table and the chart, with the pivot table as the default view.
Using the View Selector in a Compound Layout

When you click the “Done” button in the View Selector editor, you’ll go back to the compound layout, which will now consist of three views (or you may need to add the view selector first, depending on which toolbar button you used): the title, the original pivot table, and the new view selector. We don't need the original pivot table anymore, so you can remove it by clicking the appropriate button. This again is a good time to save your query.

Your compound layout should now look like this:

![Compound Layout Example](image)

To switch between views, simply choose one option or the other in the “Select Data View” dropdown.

Column Selector View

The column selector view lets users “build their own tables” essentially. In our example, we’ll let users decide if they want to see the data broken out by academic department or by gender. You obviously could get a lot more complicated than that, but, hey, this is just an example.

As above, to add a new column selector to your compound layout, use one of the “New View” toolbar buttons and look under “Other Views.” Choosing “Column Selector” will either add an empty view to the compound layout, or just open the view’s editor directly.
Column Selector Editor
The Column Selector editor has a few options for you to work with:

- **Label Position** – Where the label will appear, relative to the column selector dropdown;
- **Automatically Refresh** – Checking this box will automatically update results when you select a new column from the dropdown. If you don’t check this, you’ll have to click the “Apply” button every time you make a change.
- **Include Selector** – Each column in your query has one of these checkboxes. By checking it, you’re telling OBIEE that you want this column to be changeable by the user.
  - **Label** – For any column that you “Include,” you can specify the text that will appear next to the dropdown for that column.
  - **Choices** – For any column that you “Include,” you can then add additional columns to be included in the dropdown. You can add them by double-clicking the fields in the “Subject Areas” pane on the left side of the screen. Once you’ve included an additional column, you can remove it or add more.

In this case, we want to include “Academic Department Short Nm” as a selector, along with the “Gender Desc” field. Set the label to something like “Select Grouping Field:” and make it appear to the left of the dropdown. Finally, make sure that the column selector will automatically refresh.

Using the Column Selector in a Compound Layout
When you click the “Done” button in the Column Selector editor, you’ll go back to the compound layout, which will once again have three views (or, as before, you may need to add the column selector first, depending on which toolbar button you used): the title, the view selector, and the column selector at the bottom. The column selector would probably be a little more user-friendly if it were above the view selector, however, so just drag it there. Then try it and see if it works.

You’ve now completed the compound layout that will become the data section of your dashboard!

Your average level of utility for the rest of your life will be slightly higher if you save your query now.

I’m serious.
Creating Dashboard Prompts

As you might recall from way back on page three, we’re trying to build a personal dashboard that shows degree recipient counts for each level of degree awarded by a college/school, by either department (as the default) or gender, as either a pivot table (the default) or as a chart if the user chooses. The queries and views for that part are all done now, but we also want the user to be able to select any academic years since 2000-01. And, of course, we want this to be a dashboard and not just a query.

So first, how do you allow a user to select what years to display?

Making a Query Filter Use a Prompted Value

To enable your query results to make use of a dashboard prompt, you first need to change the filter for the field that you want to be prompted.

In your query, edit the prompt for the “Academic Yr” field, and change the operator to “is prompted.” This will delete any values that were already there.

Why didn’t we just set the query up this way to begin with, rather than having it show the most recent few years all this time? Well, try running your query now. Since there’s no longer a limit on “Academic Yr,” you get a very large result set. If you build your query and compound layout using a relatively small result set, however, things go a lot faster and you don’t have to scroll as much. So I like to get everything looking the way I want, and then change the filters to “is prompted” once I’m at the point where I don’t need to run the query anymore.

Save your query one last time, and then we’ll move on to creating the dashboard prompt itself.

Creating a New Dashboard Prompt

To create a new dashboard prompt, go up to the OBIEE toolbar and drop down the “New” button. Then choose “Dashboard Prompt.”

You’ll then be asked to select the subject area that contains your prompted field. We’ve been working with “Student Counts – Degrees,” so click once on that.
Using the Dashboard Prompt Editor

Now you’ll see the dashboard prompt editor, which looks like this at first:

To add a prompted field, such as “Academic Yr,” to the dashboard prompt that you’re building, use the green plus sign in the toolbar. This has three options, for column, variable, and image prompts. You’ll almost always use column prompts, and that’s what you should choose now. That will display a “Select Column” dialog, where you can find the field in question and select it.

After doing so, you’ll see the “New Prompt” dialog box. Here you have all sorts of options, as follows:

- **Label** – The text that appears next to the prompt.
- **Description** – The text that appears as a tooltip for this prompt.
- **Operator** – The logical operation that will be applied for this prompt.
- **User Input** – This defines the appearance of the prompt as: a text field, a choice list, a slider (for numeric fields), check boxes, radio buttons, or a list box.
- **Options** – Depending on the type of user input you selected, you’ll see different choices for formatting, defaults, etc.

Click “OK” in this box. You can always get back to it by highlighting the appropriate row in the “Definition” pane and then clicking the pencil icon “Edit” button.

Note that the row in the “Definition” pane also has one other option on the far right, a checkbox called “New Column.” By default, multiple prompts will be stacked on top of each other when displayed. If you want the prompts to appear in columns, just put a check next to the field that you want to start a new column.
**Defining Your Dashboard Prompt**

At this point, your dashboard prompt editor will look something like this, with one row for the “page,” or set of prompts, and then one row for each of the individual prompts:

To edit these, either double-click a row or highlight it and then click the pencil icon “Edit” toolbar button. If you edit the “Page 1” row, for instance, you’ll see the dialog shown to the right. You can change various things about the formatting and headings here.

Now let’s move on to the Academic Year prompt. Open the “Edit Prompt” dialog for that field, and try setting some of those options. Remember that we want to let the user choose any set of academic years from 2000-01 onward. So, we’ll want to use a choice list (or possibly a list box or check boxes), with appropriate display and default values, and a nice label of some sort.

Under “Options – Choice List Values,” you’ll have to use “SQL Results,” since we only want a specific set of years to show. Note that this refers to the OBIEE logical SQL that we talked about briefly way back in the first class, rather than actual database SQL. The good news on that is that you don’t have to write it all yourself, although it will give you a head start. You can just create a query in Analysis and copy the logical SQL (from the Advanced tab) that it produces.

Anyway, for the “Choice List Values,” you want an SQL statement that will only retrieve academic years between 2000-01 and 2011-12. It would look like this:

```
SELECT "Calendar - Snapshot Date"."Academic Yr" FROM "Student Counts - Degrees" WHERE "Calendar - Snapshot Date"."Academic Yr" BETWEEN '2000-01' AND '2010-11' ORDER BY "Calendar - Snapshot Date"."Academic Yr" DESC
```

Note that you can’t just say, `WHERE "Calendar - Snapshot Date"."Academic Yr" >= '2000-01'` because that will also retrieve future years (the academic calendar is typically defined five years out) that have no data yet. So, you’ll have to change this SQL each time a new year’s worth of data gets loaded into the EDW. Well, OK, there is a way to select only years that actually have degree data, but it requires a fiendishly complicated SQL statement:

```
SELECT t.AY FROM (SELECT "Calendar - Snapshot Date"."Academic Yr" AS AY, "FACT - Academic Degree Counts"."University Nm" AS JF FROM "Student Counts - Degrees" WHERE "Calendar - Snapshot Date"."Academic Yr" >= '2000-01' ORDER BY "Calendar - Snapshot Date"."Academic Yr" DESC) t
```
For the “Default Selection” option, enter the same “BETWEEN” SQL that you used for the “Show” option. As above, you can automatically see, say, the most recent five years of data, but the SQL statement is even more fiendishly difficult, along the lines of:

```
SELECT t.AY FROM (SELECT "Calendar - Snapshot Date"."Academic Yr" AS AY, RCOUNT("Calendar - Snapshot Date"."Academic Yr") AS RC, "FACT - Academic Degree Counts"."University Nm" AS JF FROM "Student Counts - Degrees" WHERE "Calendar - Snapshot Date"."Academic Yr" >= '2000-01' AND RCOUNT("Calendar - Snapshot Date"."Academic Yr") <= 5 ORDER BY "Calendar - Snapshot Date"."Academic Yr" DESC) t
```

Using the “Save” (✓) button up in the top right corner of your screen, save this dashboard prompt. I always name my prompts with “—Prompt” at the end so that they’re easy to find. Some people like putting prompts in a separate folder and some would rather put them with the query that they prompt. (Keep in mind that you can reuse dashboard prompts for many different queries.)

**Putting It All Together in a Dashboard**

Now all that’s left to do is to combine your compound layout with the dashboard prompt on an actual dashboard page. The ability to create dashboards that anyone can see is apparently one of the most closely guarded secrets of our time. Anyone with Analysis access, though, can create a personal “My Dashboard” that can display data that you frequently need to see.

First, click on the “Dashboards” dropdown in the OBIEE toolbar. The second option (usually) that you’ll see there is called “My Dashboard.”

When you click that link, you’ll then see a big blank page that even tells you that it’s blank, in case you weren’t sure. To create a new dashboard, click either the Edit link in the middle of the page, or the “Edit Dashboard” option on the “Page Options” menu at the top right:
The Dashboard Editor
You should now see the last of the OBIEE editors:

There’s a lot going on with the dashboard editor, so we’ll just walk through everything.

Dashboard Editor Toolbar
Toward the top of the screen, you’ll see a gray toolbar with several buttons and options:

- “Page 1” just tells you the name of the dashboard page that you’re currently building.
- The next two buttons let you add a new dashboard page or delete an existing one. Keep in mind that each page will appear as a tab in your dashboard. If you add a page, you’ll be asked to provide a name and description.
- The third button, “Tools,” has several options that let you set various properties, define how the dashboard will print, define the different links that can appear on a dashboard, allow/disallow personal customizations, and publish dashboards.
- The next two buttons let you either quickly preview your dashboard or run it for reals.
- The next two buttons let you “Save” or “Save As…” your dashboard.
- Finally, at the very end, you’ll find a “Help” button. Note that the help for OBIEE 11g is vastly improved over 10g. Yay!
Dashboard Objects and Catalog

Over on the left side of the dashboard editor, you’ll see the “Dashboard Objects” and “Catalog” sections. Dashboard objects are all of the things that you can put on your dashboard:

- **Column** – Defines columns within your dashboard page;
- **Section** – Defines a specific area on a dashboard page;
- **Alert Section** – Adds a section that displays alerts from software agents;
- **Action Link** – Runs an associated action, which can do things like allow enhanced navigation or start external processes;
- **Action Link Menu** – Adds a menu of action links from which the user can select;
- **Link or Image** – Adds text or image web links to a page;
- **Embedded Content** – Lets you display another web page inside your dashboard page;
- **Text** – Static text, HTML, or a mix of the two;
- **Folder** – Adds a folder in the OBIEE presentation catalog into your dashboard page, so that users could directly access saved queries, for instance;

The “Catalog” section gives you access to other saved dashboards (actually, the sections and contents of those dashboards), as well as all of the queries saved in your personal and the shared folders. You can drag any of these onto your dashboard page.

Dashboard Content Workspace

Finally, there’s the dashboard content workspace, where you drag and drop content for the page. For example, here’s a workspace with two columns and several sections and content types:
Notice that moving your mouse over the workspace shows toolbar buttons for each object. For instance, each column has two buttons, “Properties” and “Delete.” Each section has those, plus a couple of “Layout” buttons. Each content type has a “Delete” and a different “Properties” button. These various buttons let you take the following actions:

- **Column Properties** – Opens a dialog box that lets you change the alignment, color, and borders of each column on the page.
- **Column Delete** – Removes a column from the dashboard page.
- **Section Properties** – Lets you set section formatting and set conditions and drilling features.
- **Section Layouts** – Lets you change between horizontal and vertical layouts for a section.
- **Section Delete** – Removes the section from the dashboard page.
- **Content Properties** – Lets you define how results get displayed and what links appear under that content.
- **Content Delete** – Removes the section from the dashboard page.

### Creating Your Sample Dashboard

Now we’re finally ready to build your personal dashboard. If you clicked around in the preceding section, make sure you’re starting with a clean dashboard editor, like this:

For this example, let’s create a dashboard page named “Degree Recipients” that has two sections (you could just as easily make it one section, but that would be less interesting for purposes of this class). In the first section, show a title of some sort and the dashboard prompt on academic year that we created earlier. In the second section, show the actual data. Below the data, show at least an “Export” link, although you can include more if you want.

### Adding Dashboard Objects and Saved Content

Here are the steps for creating your dashboard:

1. First, change the name of the dashboard page to “Degree Recipients” by using the “Tools” button on the editor toolbar, choosing “Dashboard Properties...” from the menu, then highlighting the page and clicking the “Rename” button.
2. Next, add a title to your page. To do so, just drag a “Text” object into the gray workspace area. Dragging objects onto the dashboard will automatically create a column and section, or you can drag those over first if you really want to do so. Rename the section to “Header Section” and then change the text to this:

[b]Degree Recipients[br/]By Academic Year[/b]

When you’re done, it should look like this:

![Image of dashboard layout with text: Degree Recipients By Academic Year]

3. Now, using the “Catalog” pane, add the dashboard prompt that you created earlier. Place it just under the title, making sure that you get it inside the existing section, rather than creating a new one. Using the “Properties” toolbar button for the prompt, set the “Scope” to “Page”:

![Image of dashboard layout with additional text: Degree Recipients By Academic Year and Class 3 Sample Query Prompt]

4. In the header section properties, format the section so that the horizontal alignment of any content is centered.
5. Almost done! Now drag the query that you created earlier over to the workspace and drop it so that it creates a new section. Rename the section to “Report Section” and change the query “Report Links” property so that it will show at least an “Export” link (note that you can also do this at the dashboard or page level and have everything below those inherit the link settings):

![Diagram of Report Section]

6. Now click the “Save” button ( ) up in the top right corner, followed by the “Run” button ( ), and bask in the beauty of your creation. Just in case you’re unable to bask fully because of some tiny little error, you can always use the “Page Options” dropdown at the top right to “Edit Dashboard” and make any changes you might need.

Note that this dropdown menu is also where you can save or apply saved criteria selections.
A Dashboard of Your Own

So here’s more or less what you should wind up with:

```
<table>
<thead>
<tr>
<th>Degree Level</th>
<th>Academic Department Short Nm</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor</td>
<td>Chem &amp; Biomolecular Eng</td>
<td>92</td>
<td>85</td>
<td>90</td>
<td>92</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
<td>141</td>
<td>140</td>
<td>102</td>
<td>103</td>
<td>10</td>
</tr>
<tr>
<td>Bachelor Total</td>
<td></td>
<td>233</td>
<td>225</td>
<td>192</td>
<td>195</td>
<td>17</td>
</tr>
<tr>
<td>Masters</td>
<td>Chem &amp; Biomolecular Eng</td>
<td>12</td>
<td>7</td>
<td>14</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
<td>14</td>
<td>19</td>
<td>10</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Masters Total</td>
<td></td>
<td>26</td>
<td>26</td>
<td>24</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Doctoral</td>
<td>Chem &amp; Biomolecular Eng</td>
<td>26</td>
<td>14</td>
<td>12</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
<td>75</td>
<td>62</td>
<td>81</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Doctoral Total</td>
<td></td>
<td>101</td>
<td>76</td>
<td>93</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td>360</td>
<td>327</td>
<td>309</td>
<td>299</td>
<td>17</td>
</tr>
</tbody>
</table>
```

Try out the “Academic Yr” prompt, the “Apply” and “Reset” buttons, the column selector, the view selector, and the “Export” link. Also notice that the department name values automatically have drilldown enabled, so that you can easily see data for majors within a department. If anything doesn’t look right, just edit the dashboard and fix it.
Practice Dashboards

If there’s any time left (which seems unlikely as I write this, but you never know), add a new page to your personal dashboard that displays student census counts for your college, with whatever categories, column selectors, and views that you think might be interesting.

Other Info

Keep an eye on the Cal Answers blog (http://calanswers.blogspot.com/; it also has an RSS feed that you can subscribe to) for more info about using this reporting environment. Ideas for additional posts are always appreciated!