

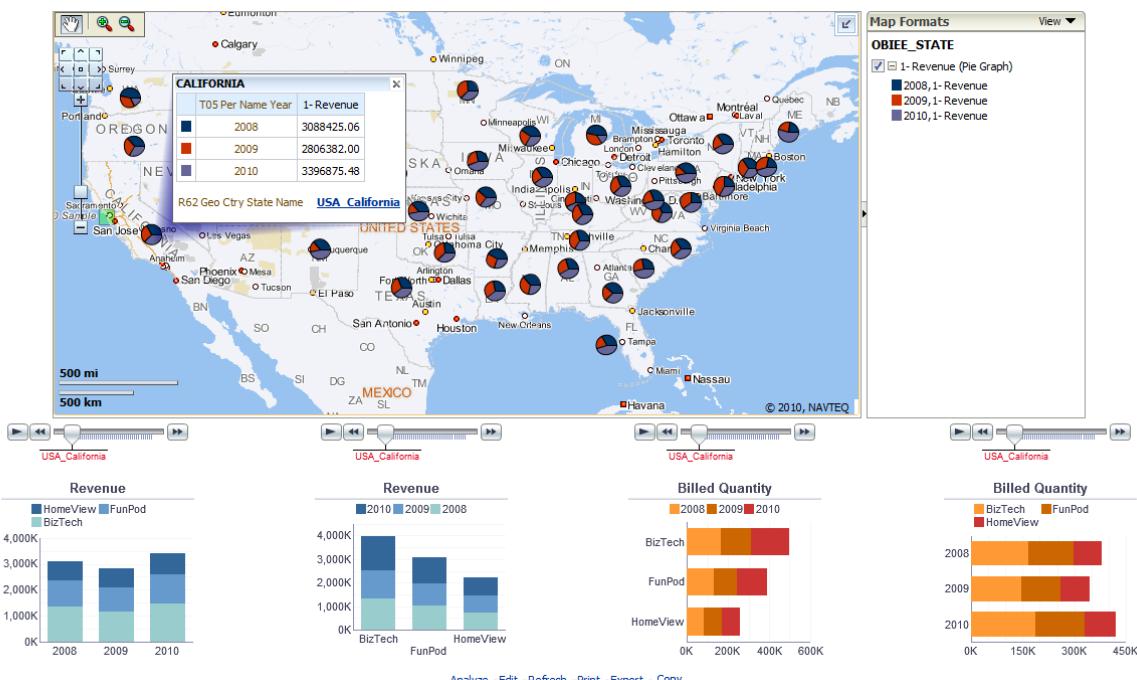
COLLABORATE 12

Building Map-based Dashboards

Participant Handbook

Abhinav Agarwal, Jayant Sharma

April, 2012



Oracle Business Intelligence 11g
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Purpose

The following workshop material is designed to introduce the new Map View feature of Oracle Business Intelligence Suite Enterprise Edition Plus (OBIEE 11g) through a set of simple hands-on exercises.

Topics

This hands-on portion workshop will cover the following topics.

- Creating a simple map view
- Adding charts to a map view
- Master-detail linking via map views
- Action Links and Map Views

Participants who are familiar with these topics, and who prefer to explore additional topics, can jump to the sections towards the end which discuss

- Using spatial functions (queries) in an analysis
 - Prompt for postcode, distance, and business category. Use `sdo_within_distance` to find and display census blocks within specified distance of the businesses in that postcode. This example uses BI presentation variables, session variables, and opaque views.
 - Find stores of a specified category (e.g. pharmacies, convenience store) within specified distance (e.g. 500 meters) of given address. Use Spatial's geocoding function (`sdo_gcdr.geocode_as_geometry`) and `sdo_within_distance` to find and list the stores. This example uses a direct database request with presentation variables.
 - Compute the distance between a selected sales outlet/office and customers associated with that office. Display both locations and the distance between them. This example uses the OBIEE EVALUATE function and Spatial's `sdo_distance` function.
- A start to finish example of importing a table with business information, importing the related map data, setting up maps and metadata, and creating map views.

The presentation and demo portion will cover the following topics.

- Why Map Views
- Map metadata management

If time permits the demo portion may also include using spatial queries in analyses and the fully worked example mentioned above.

Workshop Environment

Participants will need a laptop or desktop machine with internet connectivity and a web browser (either Firefox 3+ or Internet Explorer 8+).

Each participant will be working on their own client machine connecting to OBIEE server instance deployed on cloud servers. Details of the URL, username, and password will be provided at the start of the workshop.

Note: You can also use this with the OBIEE 11.1.1.5 Virtual Box image with SampleApp V107 currently (April 2012) available on OTN.

<http://www.oracle.com/technetwork/middleware/bi-foundation/obiee-samples-167534.html>

Use an existing user such as 'abell' or 'prodney' with SampleApp.

You will need MapBuilder11g for the mapview_lab portion. That is available from the MapViewer page on OTN. Use version 11.1.1.5 or later.

<http://www.oracle.com/technetwork/middleware/mapviewer/downloads/index.html>

Creating a Map View

Objective

In this section participants will create interactive maps using the new OBIEE 11g "Map Views" feature. They will

- Create a simple Analysis that includes a geographic dimension
- Render it as a Map View
- Preview it and observe map drill behavior

Overview

Map views are a new view type in Oracle Business Intelligence Enterprise Edition (OBIEE) 11g for displaying analysis results. This provides a valuable, rich interactive visualization capability since most BI data already contains a geographic dimension such

as store addresses, sales districts or regions. OBIEE 11g allows BI administrators to pre-associates the business model with mapping data so that analysis results are automatically map-ready. Any analysis that includes a column associated with a configured map feature is ready to be rendered in a Map View without any customization or coding whatsoever. In this lab we will create simple map views that demonstrate this capability.

Hands On:

1. First, sign in to your hosted instance using the specified workshop username and password.



Sign In

Enter your user id and password.

User ID

workshop00xx

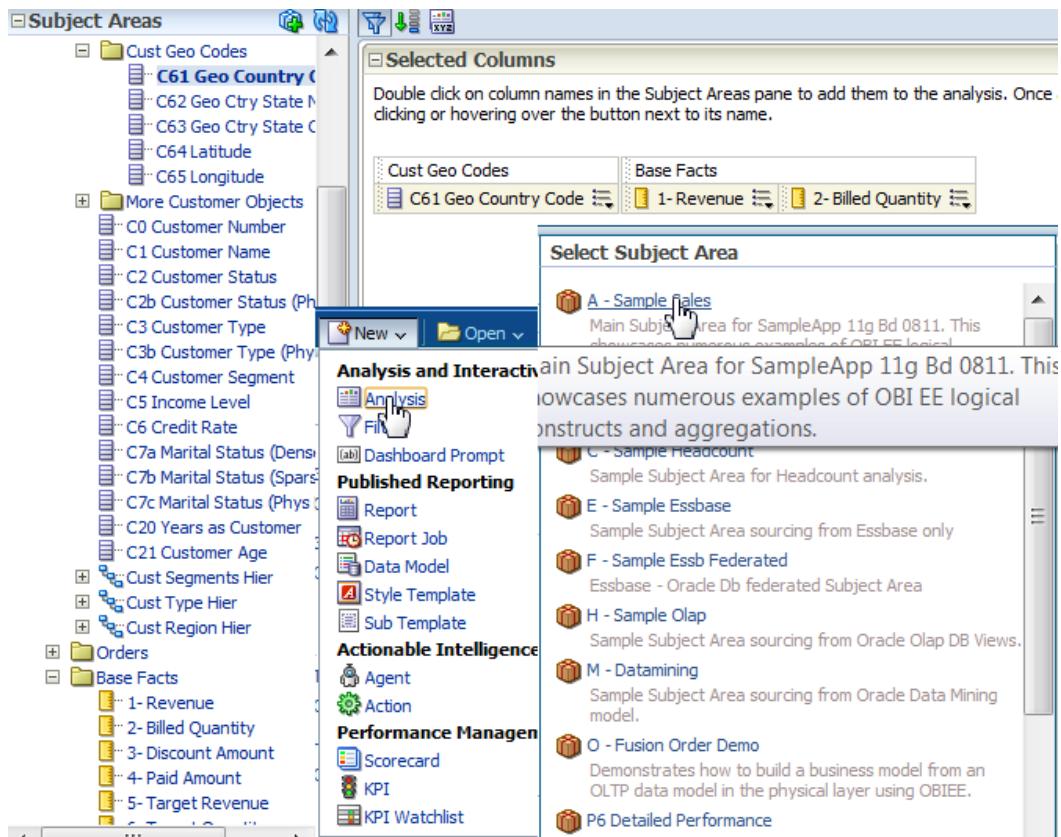
Password

••••••••

Sign In

English

2. Create a New Analysis using the Sample Sales subject area containing Customers → Cust Geo Codes → Geo Country Code, Base Facts → Revenue, and Base Facts → Billed Quantity as items. Note: The following and other images shown will contain relevant snippets from multiple screenshots of the steps involved in any portion of the hands-on exercise.



3. Click the Results tab to see a tabular view of the report. Next remove the Table View (click on the X) and click on the New View icon and select Map.

Compound Layout

Table

C61 Geo Country Code 1- Revenue 2- Billed Quantity

C61 Geo Country Code	1- Revenue	2- Billed Quantity
AFG	228526.49	21826
ARE	535306.69	57240
ARG	1301908.28	139017
AUS	6897185.77	740141
AUT	80705.52	10633
AZE	111108.79	11595
BEL	61951.38	6353
BEN	68288.27	8619
BGD	108789.30	10201
BGR	62807.06	6626
BOL	62216.20	7179
BRA	334486.25	34913
CAF	102138.07	11989
CAN	451763.78	
CHE	100895.56	
CHL	62701.84	
CHN	78853.86	
CIV	121589.98	
CMR	166698.67	
COG	83194.54	
COL	148988.37	
CRI	100794.55	
CUB	63712.59	
CZE	50213.56	
DEU	803289.61	

Rows 1 - 25

Add a Map view

The default map view should look like the following. Click on the pencil icon to edit the map view.

Compound Layout

Map

OBIEE_COUNTRY

1- Revenue (Color Fill)

First Quartile
Second Quartile
Third Quartile
Fourth Quartile

UNITED STATES

1- Revenue 14747973.40

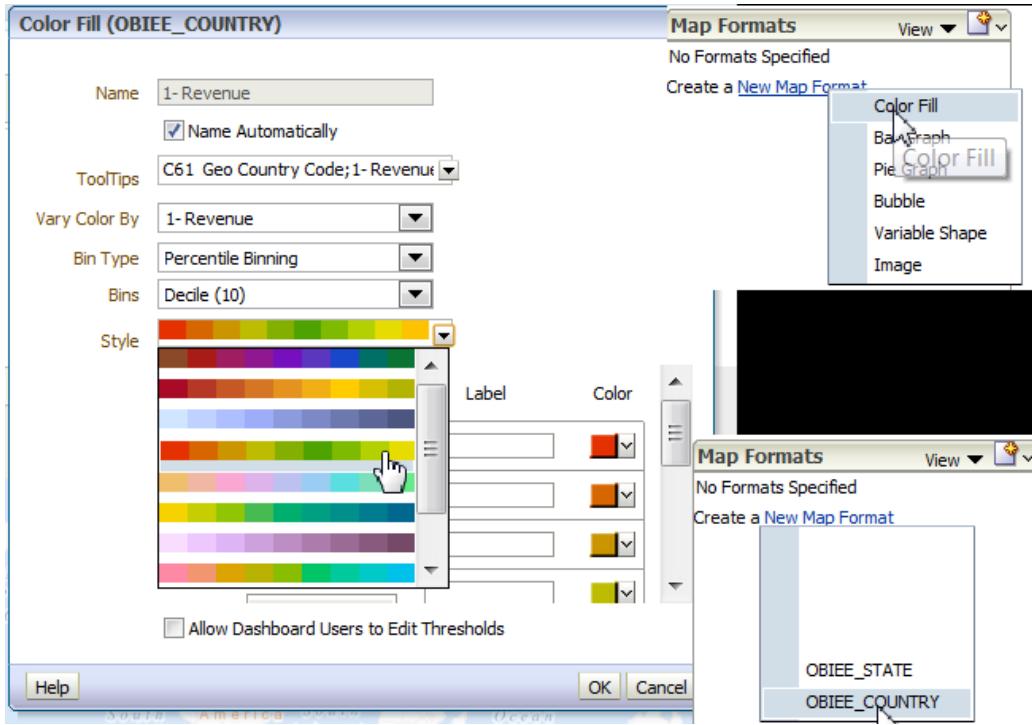
C61 Geo Country Code USA

5,000 mi

5,000 km

© 2010, NAVTEQ

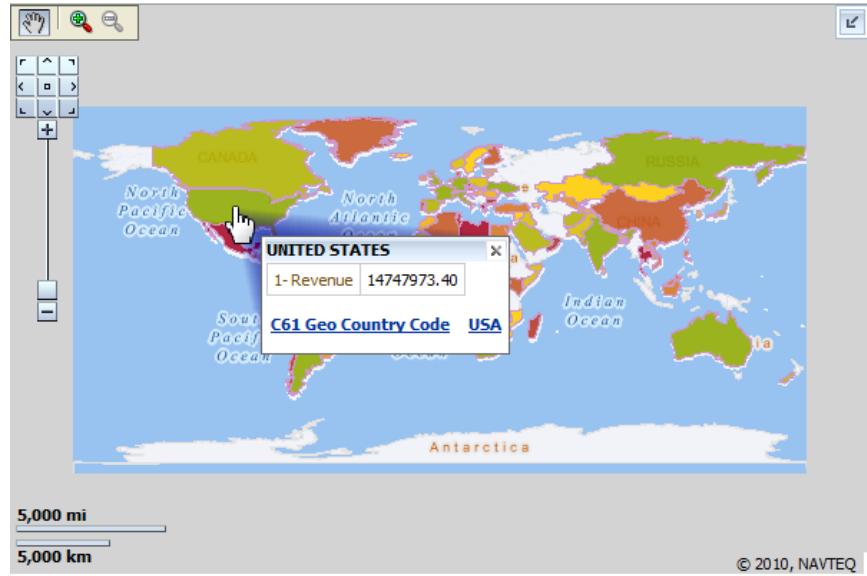
4. Hover the mouse to the right of the OBIEE_COUNTRY label in the map formats pane and edit or remove it (click on the pencil icon or **X**). If you removed it then next click on Create a New Map Format and select Color Fill and then select the OBIEE_COUNTRY layer.



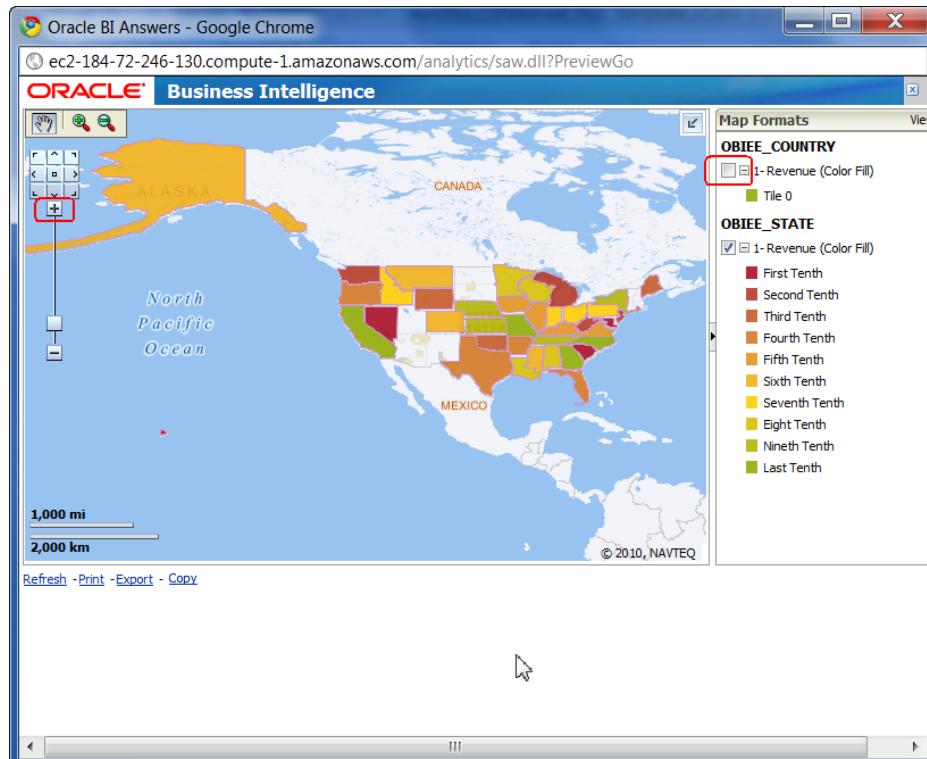
Select Percentile Binning, 10 colors, select a color ramp and click OK.

Optional: Click Edit again (but click on the edit icon next to the 1-Revenue layer) and then click "Allow Dashboard Users to edit thresholds" in the Color Fill (OBIEE_COUNTRY) dialog pane and click OK.

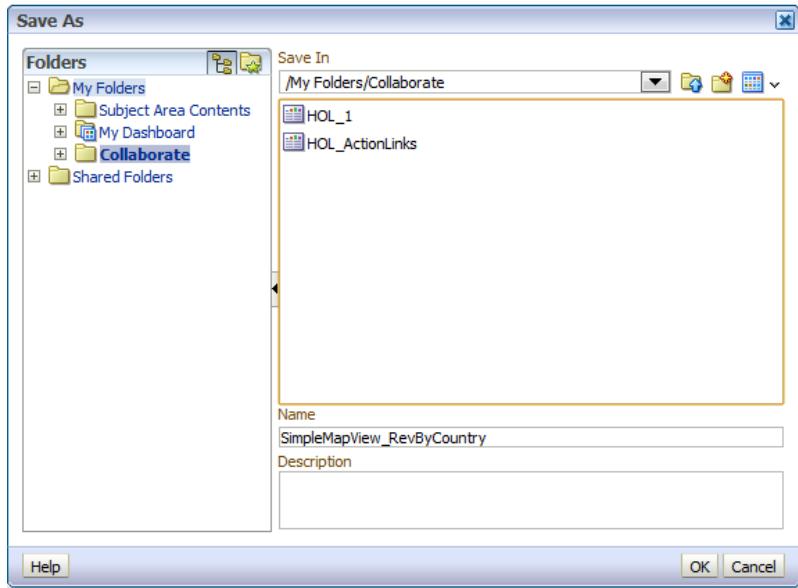
5. Next, click the "Preview" button in the Compound View toolbar to see how results would look on a Dashboard.



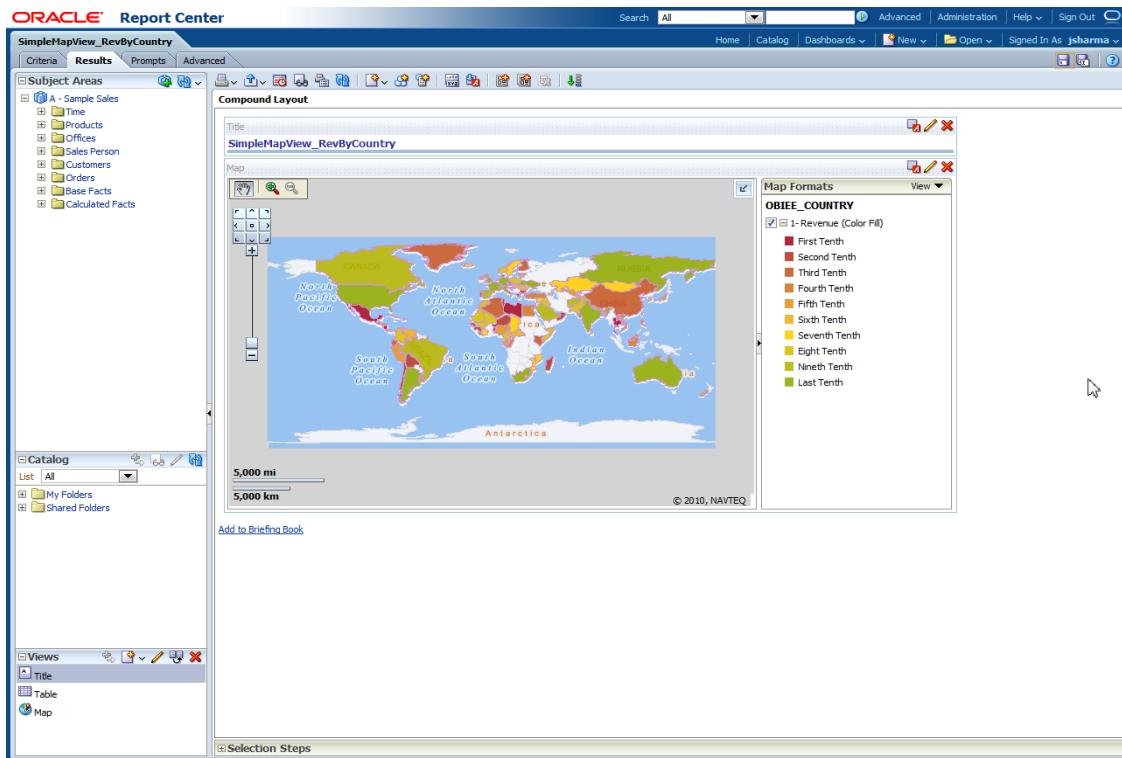
Hover over a Country, e.g. the USA, and you will see an info-window. Click on the country and then within the info-window click on the hyperlinked label USA to drill to the State level. Uncheck the box next to the map format for the OBIEE_COUNTRY layer and then either double-click someplace near the USA on the map or use the navigation panel on the map to zoom in one level and then pan over to the USA. You should see the states color-filled by Revenue.



6. Close the preview and save the newly created analysis.



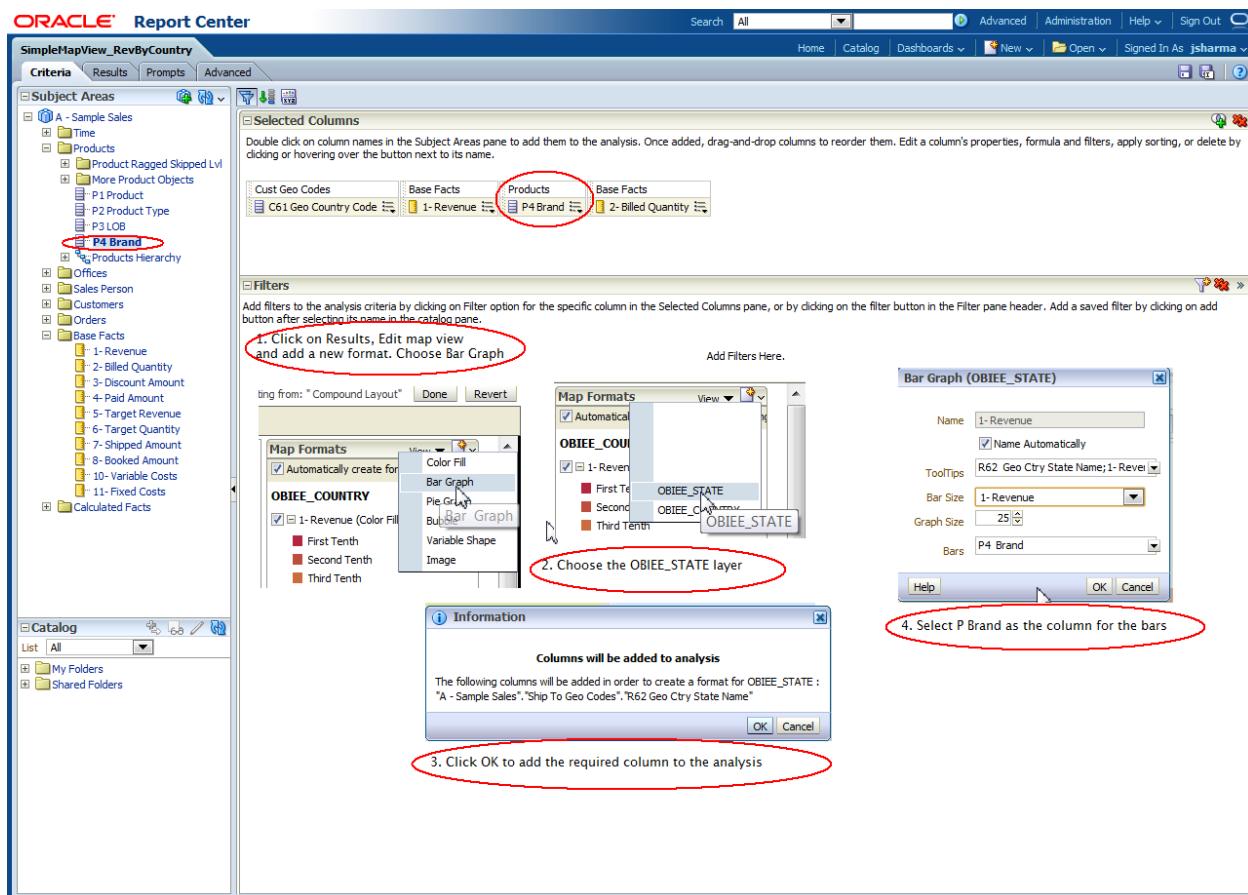
Click OK.



Adding a Bar Chart to the Map View

Now that we have a basic map view, let's add additional formats to it to display other measures. We'll add a bar chart that shows product revenue by brand by state when a user drills down from USA to US states. In order to do so we have to add Product Brand to the criteria (i.e. set of columns in the analysis), and create a new format associated with the OBIEE_STATES layer.

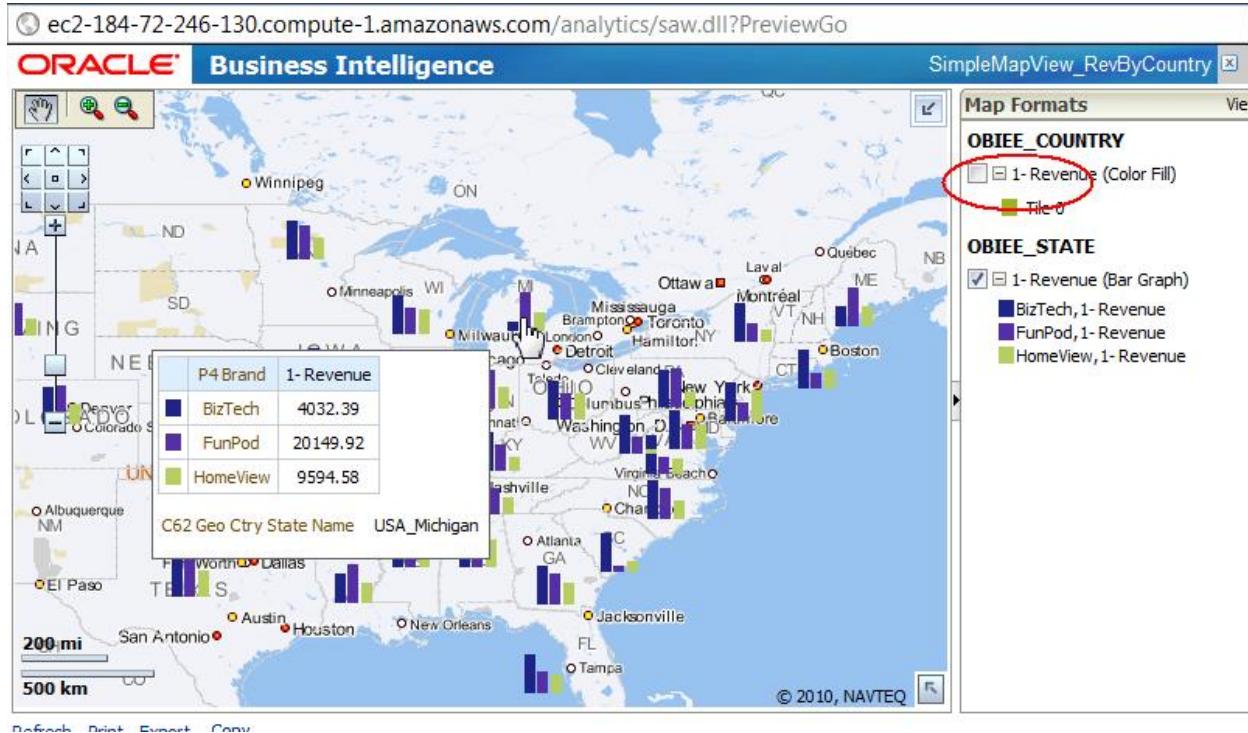
1. Click on the Criteria tab and add the Products → P4 Brand column to the set of selected columns for the analysis. The following image contains snippets from multiple screenshots.



2. Click the Results tab and edit the map view. Click on the Add a new map format icon and select Bar Graph. Then select OBIEE_STATE as the layer for this format, thereby specifying that the bar graphs will be displayed per state. Click OK when prompted that the required column (C62 Geo Ctry State Name) will be added to the analysis and finally select P4 Brand as the column for the Bars.

Pan over to the USA, zoom in once if you wish, and uncheck the OBIEE_COUNTRY layer to see the bars graphs for the states. Check the OBIEE_COUNTRY layer to turn it back on.

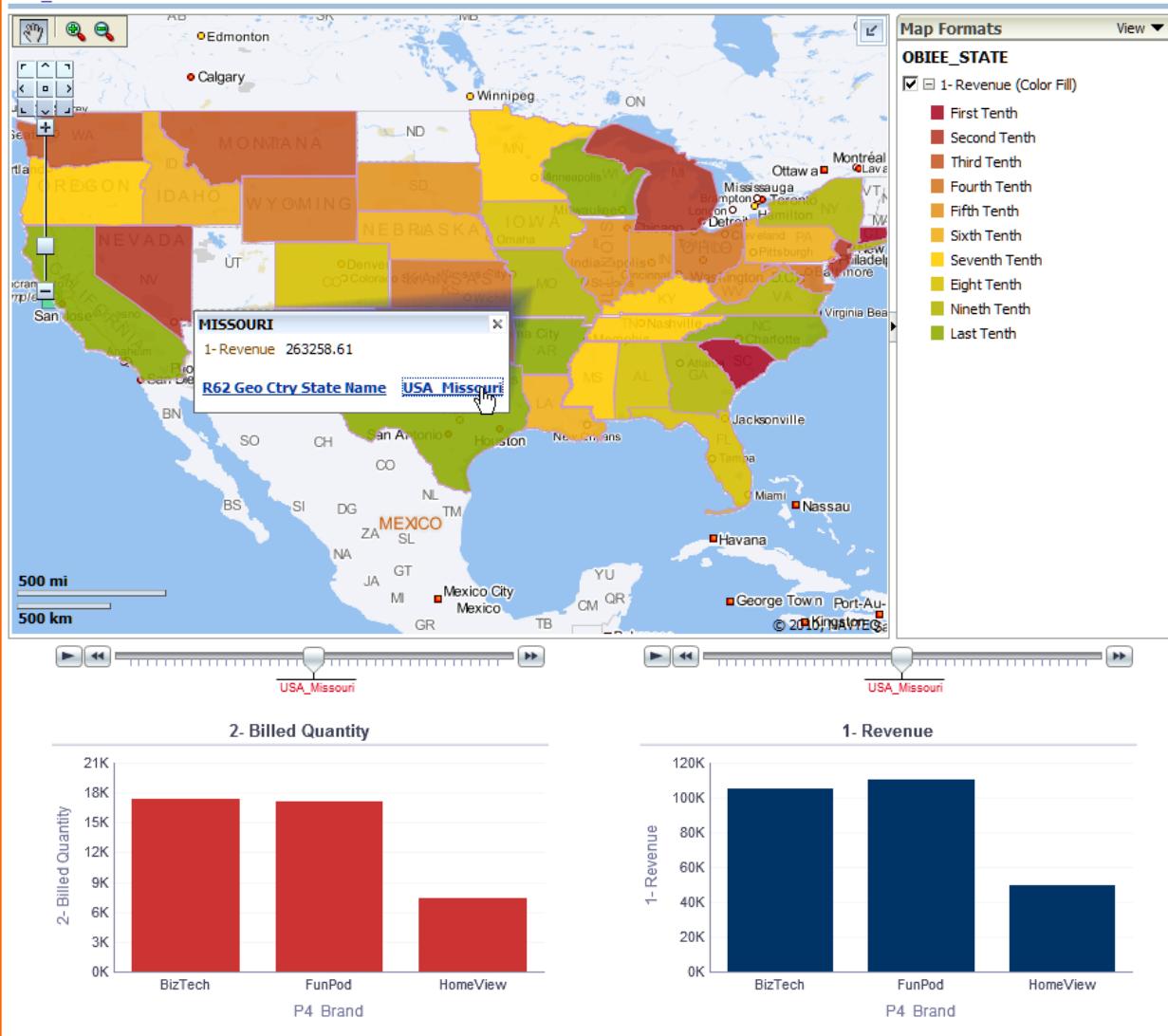
- Click on Preview to see how it'll look on a dashboard. Click on USA, and then on the USA link in the info-window to drill down to the State level. Uncheck the OBIEE_COUNTRY layer, click on a bar chart for a state, and you should see something like the following screenshot.



Exit the preview and save the modified analysis.

Master-Detail Linking via Map Views

This section describes simple master-detail linking with map views. We'll add some bar charts to the analysis created above and link them to the map. The map will act as the master and the bar charts will present details for the selected State in the map view. The resulting view, when previewed on a dashboard page, should look something like the screenshot below.



1. To get started open the previous analysis or create a new one with the C62 Geo Ctry State Name and 1-Revenue columns. Add a filter, C61 Geo Country Code is equal to/ is in USA, to the analysis. If you're creating a new analysis then add a map view and edit it to choose percentile binning (decile) and a preferred color ramp.
2. Click on Criteria again and then on the State Name column and modify the column properties. Click on the Interaction tab and select "Send Master Detail Events" for the Value property. Specify a name for the channel, e.g. M1, and click OK.

3. Next add a bar graph to the analysis (click on results, then new view → graph → bar → default (vertical)). It should add it below the map. Edit the Graph view.

Move the State Ctry Name column to Sections area, check Display as slider, click on section properties and set the maximum number of section values to 50, and click OK.

Layout
Drag/drop measures, columns and hierarchies to determine graph layout

Graph Prompts
Drop here for graph prompts

Sections **Display as Slider**
Drop here for sectioned view

Bar Graph

Measures

Bars (Vertical Axis)

- 1-Revenue

Bars

Group By (Horizontal Axis)

- R62 Geo Ctry State Name
- P4 Brand

Vary Color By (Horizontal Axis)

Show In Legend

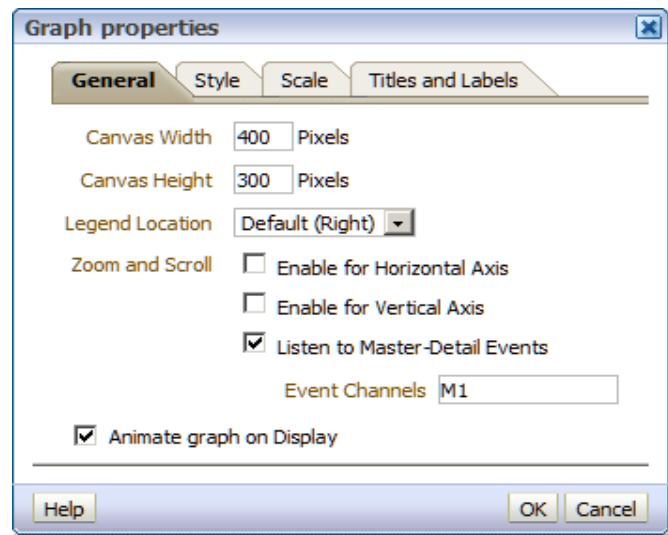
Measure Labels

Section properties

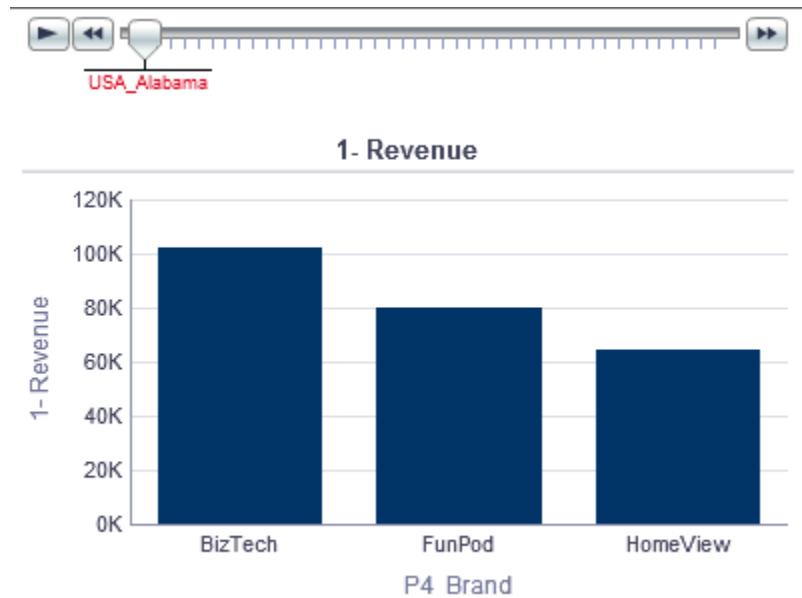
Maximum number of section slider values

OK **Cancel**

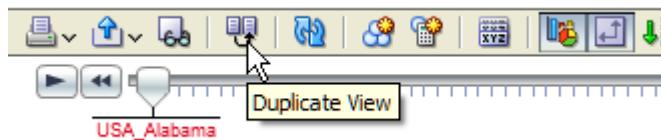
4. Add P4 Brand to the Bars, Group By (Horizontal Axis) area. Then click on the Edit icon for the graph to change its size (to 400x300 pixels), and check the box "respond to master events" on channel M1. In the Style tab select "Rectangle" and click OK.



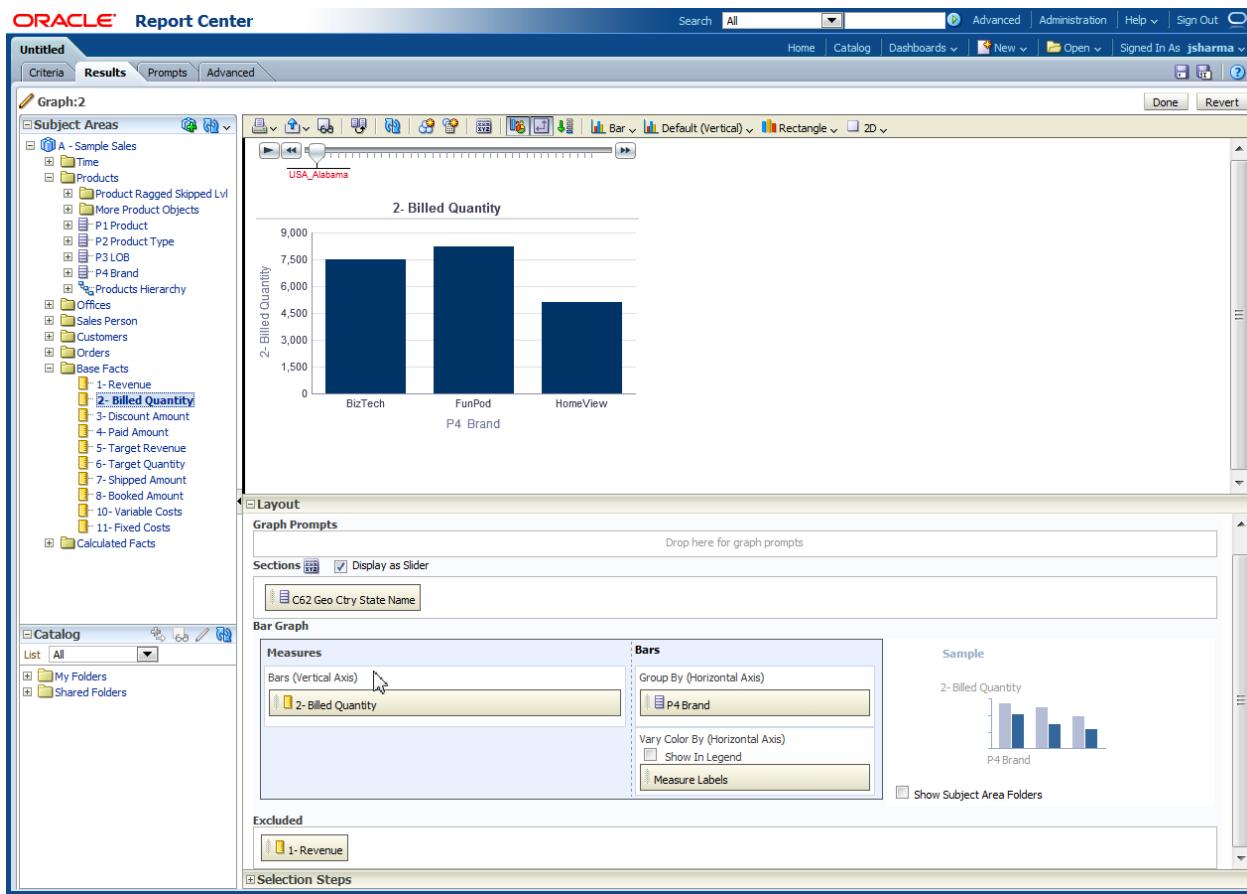
The graph should look like the one shown below.



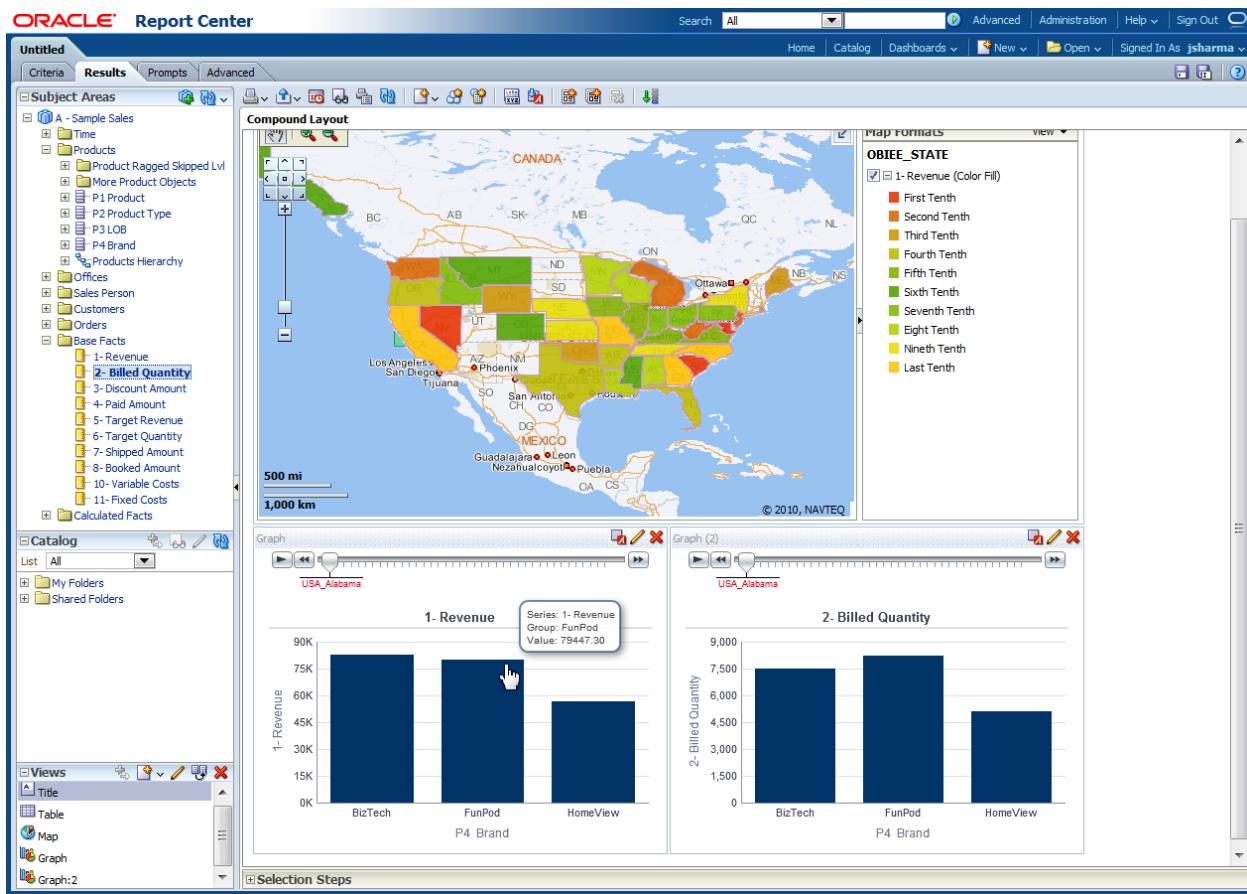
5. Now click duplicate view, and



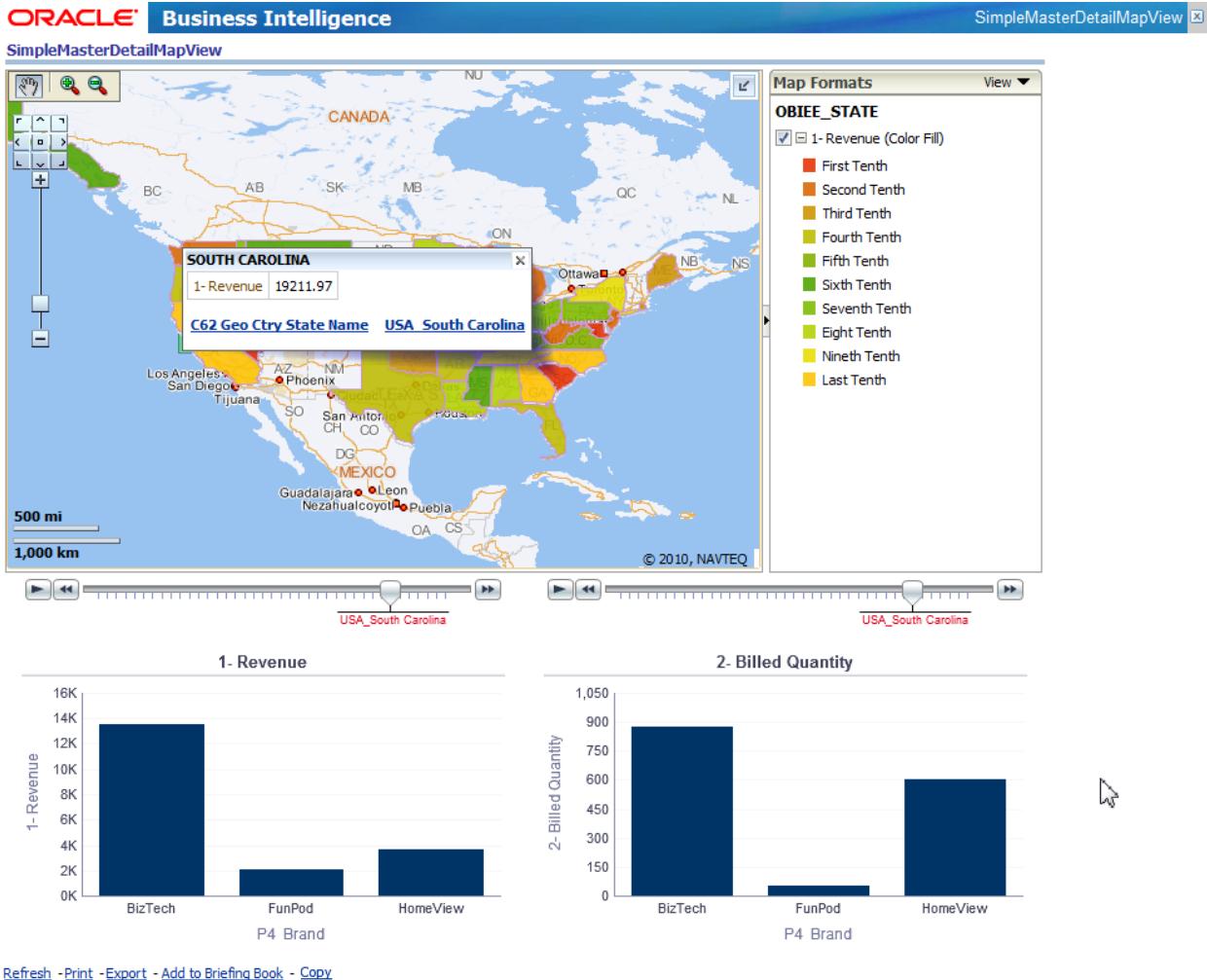
remove Revenue from the Measures and add Billed Quantity instead, and finally click Done.



6. Add Graph 2 to compound view to the right of the first graph. That is drag the Graph:2 icon from the Views pane and drop it in the Compound Layout just to the right of the existing Graph view.



7. Click Preview and test Master Detail linking.



Action Links via Map Views

The last hands-on exercise uses action links as the interaction mechanism instead of the master-detail events which were used above. Save the analysis with a different name, i.e. click on Save As and name it something else (e.g. SimpleActionLinkMapView).

1. Now create a new analysis which will have details by state. Add the C62 Geo Ctry State Name column, add a filter for Country Code = USA AND C62 Geo Ctry State Name is prompted, and add other columns to the analysis. See the screenshot below for an example.

The screenshot shows the 'PromptedStateDetailTable' interface with the 'Criteria' tab selected. The 'Selected Columns' pane lists various columns including 'Cust Geo Codes', 'Products', 'Simple Calculations', 'Base Facts', and 'C62 Geo Ctry State Name'. The 'Filters' pane shows a filter for 'C61 Geo Country Code is equal to / is in USA' and 'C62 Geo Ctry State Name is prompted'.

View the results and save the analysis (e.g. name it PromptedStateDetailAnalysis).

The screenshot shows a detailed data table with the following columns: C62 Geo Ctry State Name, P4 Brand, P3 LOB, P2 Product Type, P1 Product, 46 Avg Order Process Time, 24 Avg # of Orders by Sales Rep, 23 Avg # of Orders by Customer, 25 Avg Order Size, 11-Fixed Costs, and 10-Variable Costs. The data is grouped by state and brand, with further sub-grouping by product type and category.

C62 Geo Ctry State Name	P4 Brand	P3 LOB	P2 Product Type	P1 Product	46 Avg Order Process Time	24 Avg # of Orders by Sales Rep	23 Avg # of Orders by Customer	25 Avg Order Size	11-Fixed Costs	10-Variable Costs	
USA_Alabama	BizTech	Communication	Cell Phones	V5x Flip Phone	7.67	1.00	1.00	2332.65	1334.00	3655	
				CompCell RX3	6.00	1.00	1.00	3575.27	1025.00	1884	
		Electronics	Accessories	Smart Phones	10.43	1.40	1.75	2547.27	4247.00	8118	
				Touch-Screen T5	4.00	1.00	1.00	3443.68	899.00	3116	
	FunPod	Digital	Camera	Bluetooth Adaptor	10.33	1.50	1.00	1924.56	1299.00	3123	
				MP3 Speakers System	9.33	1.00	1.50	3063.44	1129.00	4542	
		Games	Fixed	SoundX Nano 4Gb	7.00	1.00	3.00	3299.09	1470.00	3841	
				MicroPod 60Gb	7.71	1.17	2.33	3169.14	4088.00	10105	
HomeView	Services	Maintenance	Maintenance	1.00	1.00	1.00	3413.85	345.00	2300		
				TV	LCD	13.50	1.20	1.50	3814.73	3450.00	14469
		Plasma	LCD	10.50	1.00	2.00	2151.78	934.00	2335		
			Plasma	Plasma HD Television	6.50	1.00	1.00	2229.15	1159.00	3093	
	USA_Alaska	BizTech	Communication	Cell Phones	Tungsten E Plasma TV	6.11	1.29	2.25	2381.23	4243.00	11412
					V5x Flip Phone	10.50	1.00	4.00	2011.19	1625.00	4902
		Electronics	Accessories	CompCell RX3	2.00	1.00	1.00	2343.24	598.00	993	
				Smart Phones	5.00	1.00	2.00	1352.10	787.00	839	

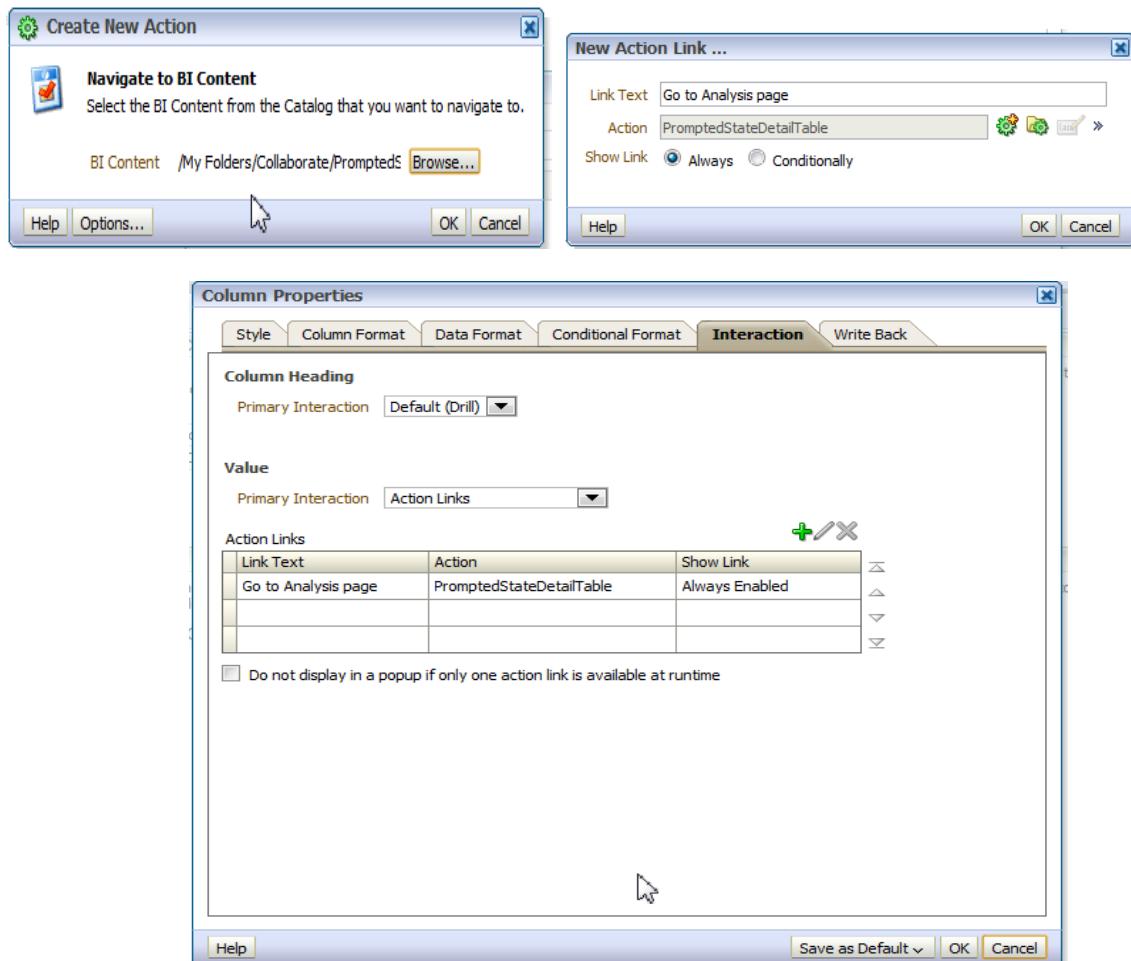
- Next open the previously saved analysis (SimpleActionLinkMapExample), click on Results if necessary, and edit the Compound Layout. Remove the two graph views (Graph and Graph (2)).

Add a Table view below the map view (Not sure if it's a bug or a feature but a table view is needed for the action link to work in the map view).

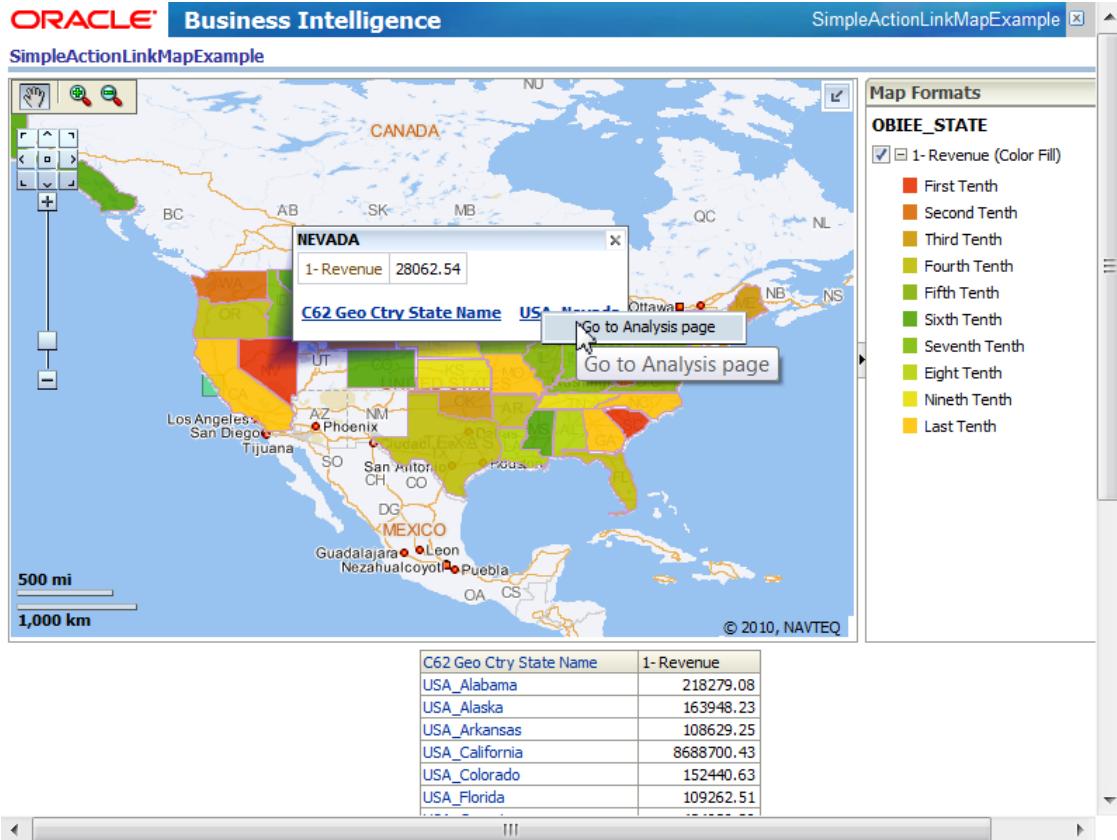
3. Now click on Criteria and edit the column properties for the Ctry State Name column to change the Interaction from Send Master-Detail Events to Action Link. In the Action Links dialog click on add Action Link, select Navigate to BI Content, choose the saved detail analysis (PromptedStateDetailAnalysis), and click OK where prompted.

The image consists of three screenshots of the Oracle BI Collaborate software interface:

- Top Screenshot:** The "Column Properties" dialog is open. The "Interaction" tab is selected. Under "Value", the "Primary Interaction" is set to "Action Links". The "Action Links" table has one row: "Link Text" is "Add Menu Action Links", and "Action" is empty. There is a checkbox at the bottom left: "Do not display in a popup if only one action link is available at runtime".
- Middle Screenshot:** The "New Action Link ..." dialog is open. It has fields for "Link Text" (empty), "Action" (empty), and "Show Link" (radio buttons for "Always" and "Conditionally").
- Bottom Screenshot:** The "Select BI Content For Action" dialog is open. The "Folders" tree on the left shows "My Folders" with "Subject Area Contents", "My Dashboard", and "Collaborate" expanded. The "Open In" list on the right shows several BI content items: HOL_1, HOL_ActionLinks, MapActionLinkExample, PromptedStateDetailTable (which is selected), SimpleActionLinkMapExample, SimpleMapView_RevByCountry, SimpleMasterDetailMapView, and TempActionExample. On the left, a toolbar has icons for "Navigate to BI Content" (highlighted with a red box), "Create an Action to navi", "Dashboard Page", "Invoke a Java Method", "Invoke a Browser Script", and "Invoke an HTTP Request".



4. Preview the analysis (i.e. click on show how results will look on a dashboard) and test the action link.



ORACLE® Business Intelligence PromptedStateDetailTable

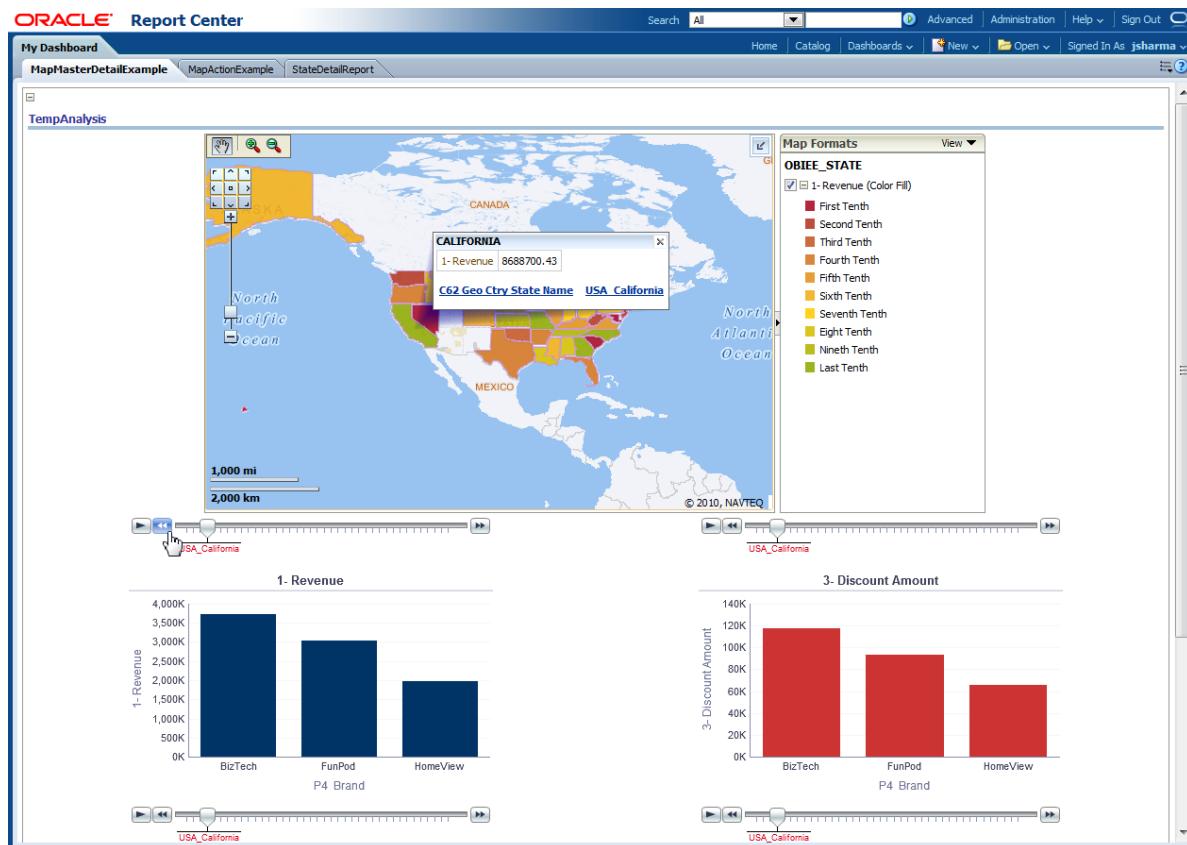
PromptedStateDetailTable

C62 Geo Ctry State Name	p4 Brand	P3 LOB	P2 Product Type	P1 Product	46 Avg Order Process Time	24 Avg # of Orders by Sales Rep	23 Avg # of Orders by Customer	25 Avg Order Size	11-Fixed Costs	10-Variable Costs	
USA_Nevada	BizTech	Communication	Cell Phones	V5x Flip Phone	5.00	1.00	1.00	3535.21	591.00	1204	
			Smart Phones	Touch-Screen T5	7.00	1.00	1.00	184.36	55.00	123	
		Electronics	Accessories	Bluetooth Adaptor	13.00	1.00	1.00	3142.91	943.00	2177	
			Audio	MicroPod 60Gb	6.00	1.00	2.00	2096.37	673.00	1668	
	FunPod	Digital	Camera	MPEG4 Camcorder	11.00	1.00	2.00	1242.48	582.00	770	
				7 Megapixel Digital Camer	9.00	1.00	2.00	1976.35	881.00	1425	
	HomeView	Services	Games	Portable	PocketFun ES	8.00	1.00	1.00	1938.77	426.00	815
			TV	Maintenance	Maintenance	3.00	1.00	1.00	3855.25	1082.00	1545
				LCD	LCD 36X Standard	1.00	1.00	1.00	420.08	123.00	145
				Plasma	Tungsten E Plasma TV	16.00	1.00	1.00	4355.56	1301.00	3016

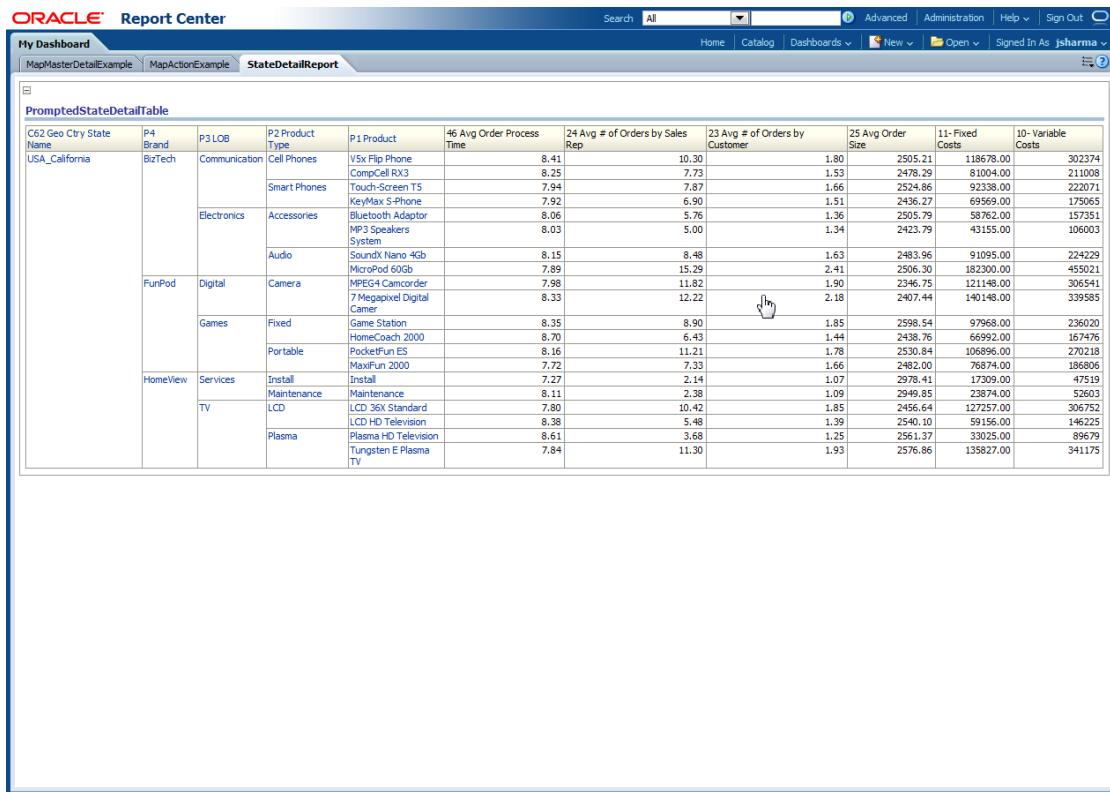
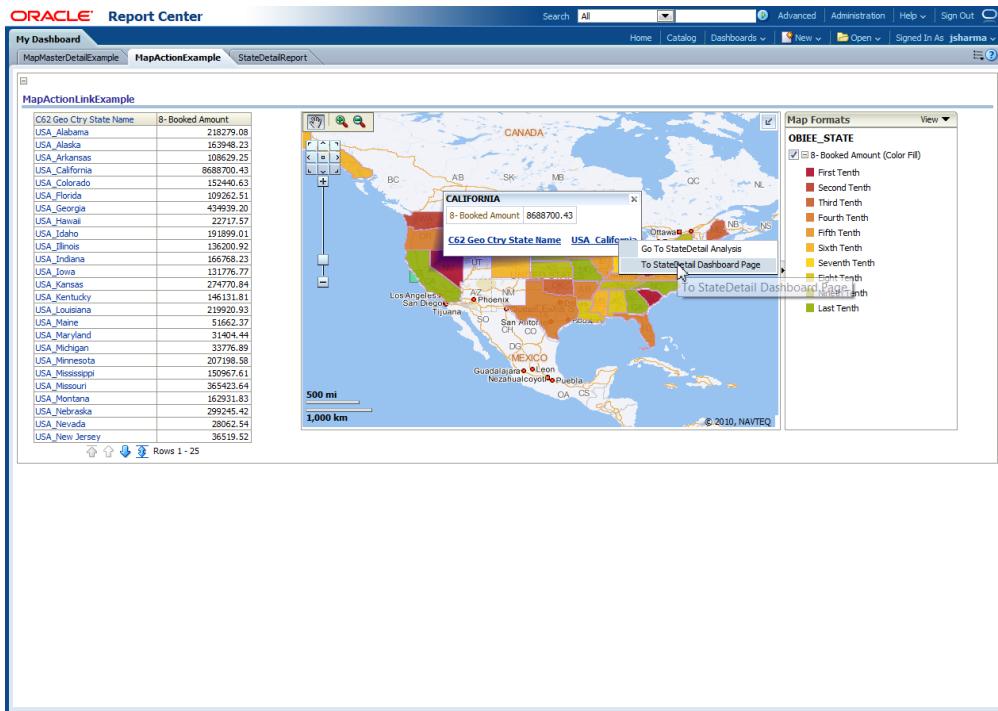
[Refresh](#) [Print](#) [Export](#) [Add to Briefing Book](#) [Copy](#)

Exercises

1. Publish your analyses containing maps to a dashboard page. Optionally create a dashboard with three pages. The first one containing the master-detail linking example, the second containing the action link example, and the third containing the prompted state detail analysis which is linked to from the action link map example.



2. Modify the simple map action link analysis to add a section action link to the C62 Geo Ctry State Name column value. This one should navigate to the third dashboard page (the one with the prompted state detail analysis) you created above.



Using spatial queries in analyses

Example 1: Demographics info for census blocks near selected stores

In this example we'll recreate portions of the "Blocks in Distance Range" page of the "Source Specific Features"."8.5 Oracle Spatial" dashboard in SampleApp. We will reuse the existing prompts, opaque views, and presentation and session variables. That is, we will not define them again. The rationale for, and steps involved in, defining them will be outlined however.

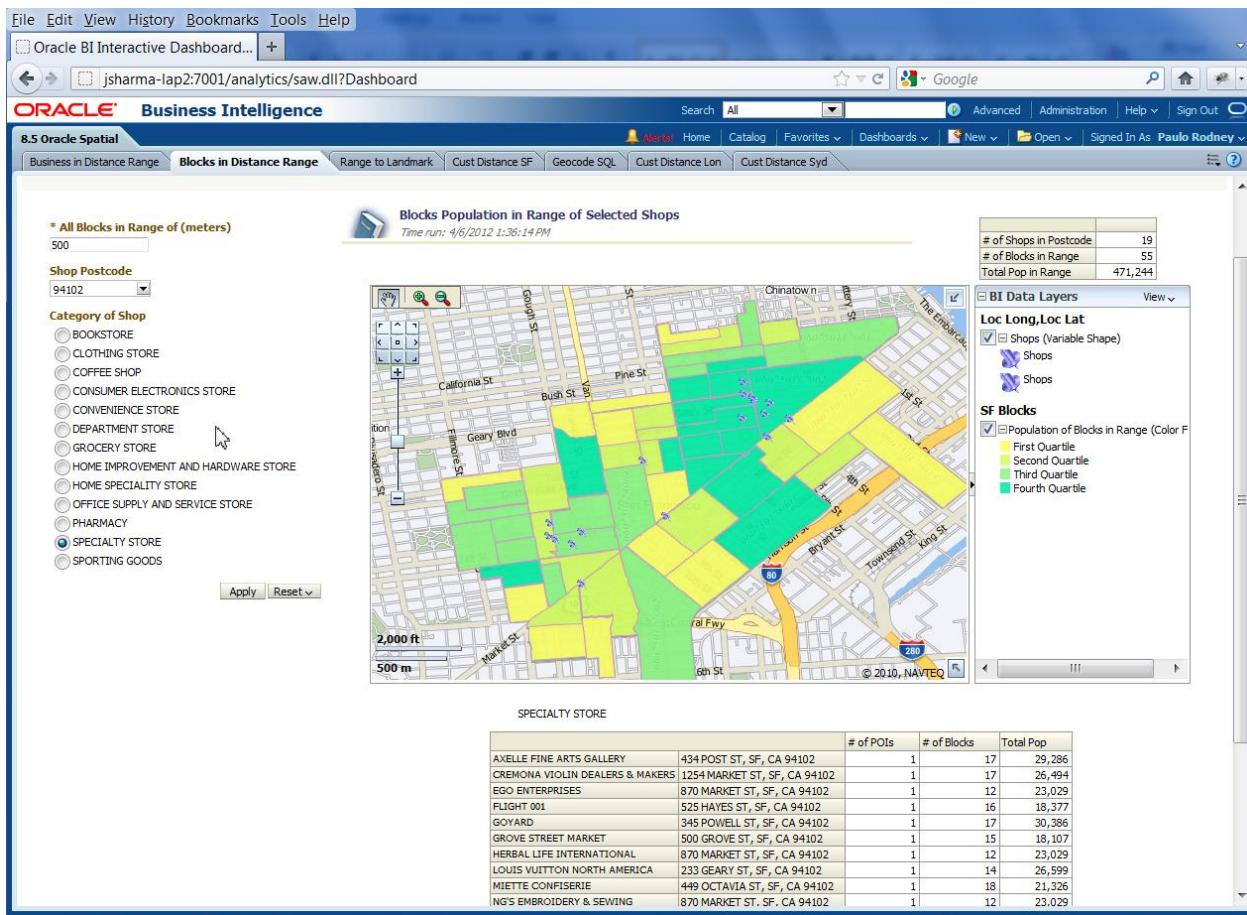
This example is intended to illustrate functionality and is not necessarily a realistic use case. It shows the following:

How to use spatial functions in database queries from OBIEE

How do use opaque views, presentation and session variables, and dashboard prompts to pass parameters to the above spatial queries

The NAVTEQ sample data contains street, postcode, and points-of-interest or business listing details, and some census block level demographics, for San Francisco, London, and Sydney.

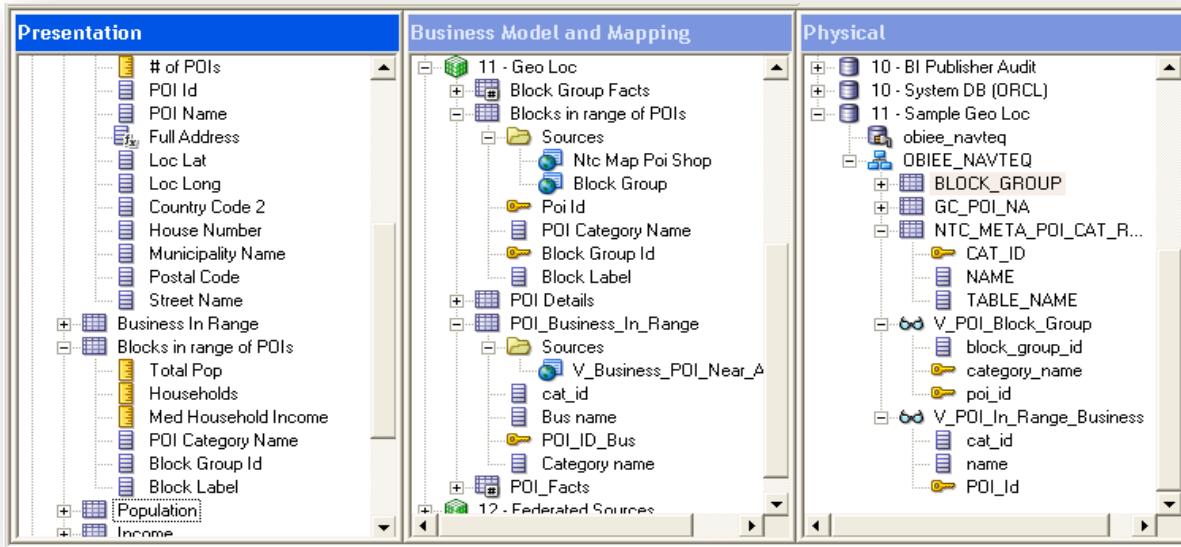
The screenshot below shows the relevant SampleApp dashboard page.



First let's look at the RPD side of things, i.e. the database query, bind variables, and corresponding business and presentation layers.

The physical layer consists of the tables and opaque views shown below. The Block_Group table contains the census block level demographics (household income, population, and education). The GC_POI_NA (points-of-interest North America) contains a sample, limited to San Francisco, of NAVTEQ's POI content. It contains information on the establishment name (e.g. Flight 001), the category ID, address, phone number and other details. The NTC_META_POI_CAT_REF table is a metadata table containing category_ids and names (e.g. 5400 = GROCERY STORE or 9567 = SPECIALTY STORE).

The view V_POI_Block_Group is the query to find block groups that are within a specified distance of selected stores. For example, block groups within 500 meters of Specialty Stores in zip 94102. The postal code, category id, and distance (in meters) values are passed in as bind variables.



The view is defined as a SELECT table in the BI Admin tool as shown in the screenshot below. Note the use of Database specific SQL.

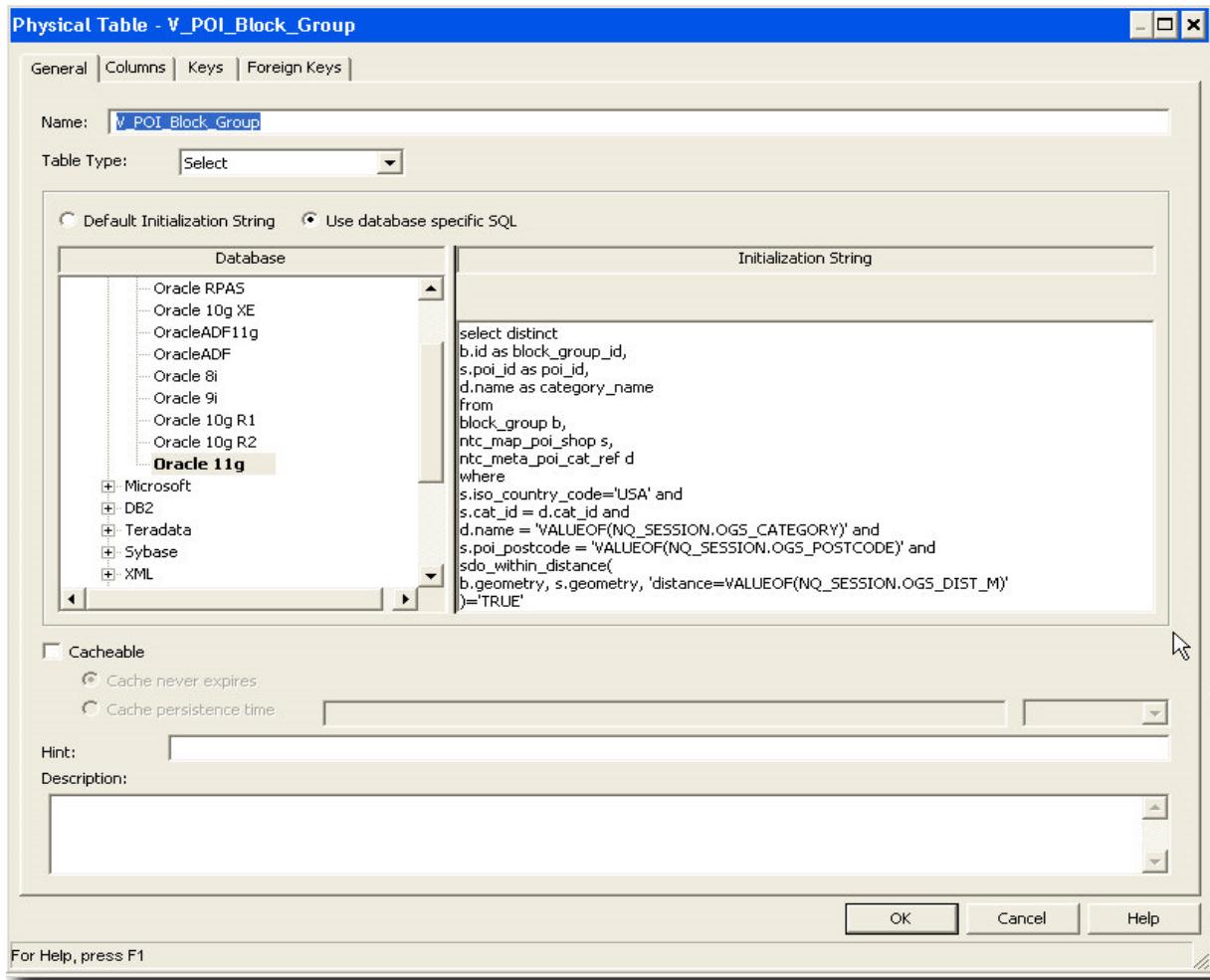
The query text is

```

select distinct
b.id as block_group_id,
s.poi_id as poi_id,
d.name as category_name
from
block_group b,
ntc_map_poi_shop s,
ntc_meta_poi_cat_ref d
where
s.iso_country_code='USA' and
s.cat_id = d.cat_id and
d.name = 'VALUEOF(NQ_SESSION.OGS_CATEGORY)' and
s.poi_postcode = 'VALUEOF(NQ_SESSION.OGS_POSTCODE)' and
sdo_within_distance(
b.geometry, s.geometry, 'distance=VALUEOF(NQ_SESSION.OGS_DIST_M)'
)='TRUE'

```

OGS_CATEGORY contains the category name (e.g. SPECIALTY STORE), OGC_POSTCODE is the zipcode (e.g. 94102), and OGC_DIST_M is the distance in meters. The spatial operator sdo_within_distance(blocks, stores, 'distance=500') returns TRUE for blocks (b.geometry) that are within 500m of a SPECIALTY STORE in 94102 and FALSE otherwise.



The session variables are defined as non-system with default values.

Name	Description	Default...	Initialization Block
OGS_CATEGORY			DUAL OGS CATEGORY VALUE = 'PHARMACY'
OGS_POSTCODE	Used for G...	'94102'	DUAL OGS POSTCODE VALUE = '94102'
OGS_DIST_M	Used for G...	10	DUAL GENERIC NUM VALUE = 10
OGS_ADDRESS	Used for G...	747 H...	DUAL ADDRESS VALUE = FIXED ADDRESS
LTS_FILTER_PROD_KEY		10	LTS_FILTER_PROD_KEY

The dashboard prompts are defined as shown with each setting a request variable.

ORACLE® Business Intelligence

Block to Shops Distance Prompt

Definition

Add prompts for users when they run this analysis.

Prompt Label	Type	Prompt For	Description	Required	New Column
Page 1	Page				
All Blocks in Range of (meters)	Column value	123		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shop Postcode	Column value	Postal Code		<input type="checkbox"/>	<input type="checkbox"/>
Category of Shop	Column value	POI Category Name		<input type="checkbox"/>	<input type="checkbox"/>

Display

Page 1

* All Blocks in Range of (meters)
500

Shop Postcode
94102

Category of Shop

- BOOKSTORE
- CLOTHING STORE
- COFFEE SHOP
- CONSUMER ELECTRONICS STORE
- CONVENIENCE STORE
- DEPARTMENT STORE
- GROCERY STORE
- HOME IMPROVEMENT AND HARDWARE STORE
- HOME SPECIALTY STORE
- OFFICE SUPPLY AND SERVICE STORE
- PHARMACY

Edit Prompt: Shop Postcode

Prompt For Column "POI Details"."Postal Code"

Label Shop Postcode

Description

Operator is equal to / is in

User Input Choice List

Options

Choice List Values All Column Values

Include "All Column Values" choice in the list

Limit values by All Prompts

Enable user to select multiple values

Enable user to type values

Require user input

Default selection Specific Values

94102

Choice List Width Dynamic Pixels

Set a variable Request Variable

Edit Prompt: All Blocks in Range of (met...)

Prompt For Column 123

Label All Blocks in Range of (meters)

Description

Operator is equal to / is in

User Input Text Field

Options

Require user input

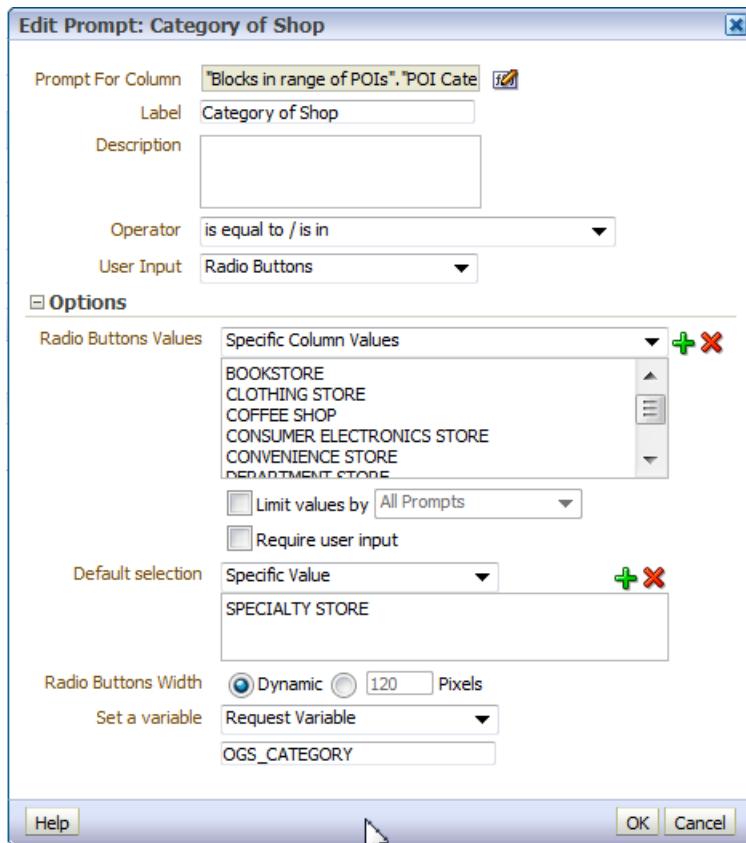
Default selection Specific Value

Text Field Width Dynamic Pixels

Set a variable Request Variable

Help

Help



Hands-on portion of the example

Next we'll create an analysis and a dashboard page using the elements described above.

Click on New Analysis and select the Geoloc subject area. Expand the Blocks in range of POIs folder and add the Block Group Id, POI Category Name, and Households columns to the analysis. Expand the POI Details folder and add the POI Name, Loc Long, Loc Lat, # of POIs, and Full Address columns to the analysis.

Then click on the Results tab. After the query is performed (may take a while depending on the HOL environment) edit the table properties and change them as shown in the screenshot below. Move (drag and drop) the POI category Name to the Section header in the Layout Panel. Move Block Group ID, Loc long, and Loc lat columns to the Excluded list. Rename # of POIs to be # of Blocks (since we're grouping by POI name in the table). And order the remaining columns as shown.

Then click on Done and add a map view to the analysis. Like the table, the map view may take a while to render.

Oracle OLAP Datasource Examples

I - Sample TimesTen
Oracle TimesTen In Memory Datasource Examples

J - Sample SSAS
MS SSAS Cube Datasource Examples

K - Sample Flat Files
Flat XML Files Datasource Examples

L - Geo Loc (highlighted with a red arrow)

Geo Localization Expressions Examples

N - Sample BPM
BPM (Business Process Management) Analytics

O - Fusion Order Demo
OLTP Transactional Datamodel Analytics Examples

S - Scheduled Jobs
OBIEE Scheduler Job Status Monitoring Examples

U - Usage Tracking
OBIEE Usage Monitoring Analytics Examples

ORACLE® Business Intelligence

Untitled

Criteria Results Prompts Advanced

Subject Areas

- L - Geo Loc
 - POI Details
 - Business In Range
 - POI Id
 - POI Name
 - Full Address
 - Loc Lat
 - Loc Long
 - Country Code 2
 - House Number
 - Municipality Name
 - Postal Code
 - Street Name
 - Blocks in range of POIs
 - Population
 - Income
 - Education Facts
 - Total Pop
 - Households
 - Med Household Income
 - POI Category Name
 - Block Group Id
 - Block Label

Catalog

My Folders

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, formula and filters, apply sorting, or delete by clicking or hovering over the button next to its name.

POI Details

Block Group Id, POI Category Name, Households, POI Name, Full Address, Loc Long, Loc Lat, # of POIs

Filters

Add filters to the analysis criteria by clicking on Filter option for the specific column in the Selected Columns pane, or by clicking on the filter button in the Filter pane header. Add a saved filter by clicking on add button after selecting its name in the catalog pane.

Add Filters Here.

Table

Subject Areas

L - Geo Loc

POI Details

Blocks in range of POIs

PHARMACY

POI Name	Full Address	Households	# of POIs
ELLIS PHARMACY	468 ELLIS ST, SF, CA 94102	45,527	48
MASON STREET DISPENSARY	120 MASON ST, SF, CA 94102	36,897	39
RITE AID	1496 MARKET ST, SF, CA 94102	31,376	42
	776 MARKET ST, SF, CA 94102	37,595	41
WALGREENS	135 POWELL ST, SF, CA 94102	41,758	45
	300 GOUGH ST, SF, CA 94102	32,355	44
	459 POWELL ST, SF, CA 94102	49,379	52
	500 GEARY ST, SF, CA 94102	46,027	47
	730 MARKET ST, SF, CA 94102	34,841	37
	790 VAN NESS AVE, SF, CA 94102	47,792	50

Layout

Blocks in range of POIs

POI Category Name

Table

Columns and Measures

POI Details, Blocks in range of POIs, POI Details

Excluded

Blocks in range of POIs, POI Details, Block Group Id, Loc Long, Loc Lat

POI Details

of POIs

Format Headings...

Format Values...

Hidden

Aggregation Rule >

Duplicate Layer

Remove Column

Edit Format

Caption: # of Blocks

Font

Family: Default (System)

Size: []

Color: []

Style: Default (System)

Effects: Default (System)

PHARMACY

POI Name	Full Address	Households	# of Blocks
ELLIS PHARMACY	468 ELLIS ST, SF, CA 94102	45,527	48
MASON STREET DISPENSARY	120 MASON ST, SF, CA 94102	36,897	39
RITE AID	1496 MARKET ST, SF, CA 94102	31,376	42
	776 MARKET ST, SF, CA 94102	37,595	41
WALGREENS	135 POWELL ST, SF, CA 94102	41,758	45
	300 GOUGH ST, SF, CA 94102	32,355	44
	459 POWELL ST, SF, CA 94102	49,379	52
	500 GEARY ST, SF, CA 94102	46,027	47
	730 MARKET ST, SF, CA 94102	34,841	37
	790 VAN NESS AVE, SF, CA 94102	47,792	50

Layout

Blocks in range of POIs

POI Category Name

Table

Columns and Measures

POI Details

Blocks in range of POIs

POI Details

POI Name

Full Address

Households

of Blocks

Compound Layout

Title

Table

Pivot Table

Graph

Gauge

Funnel

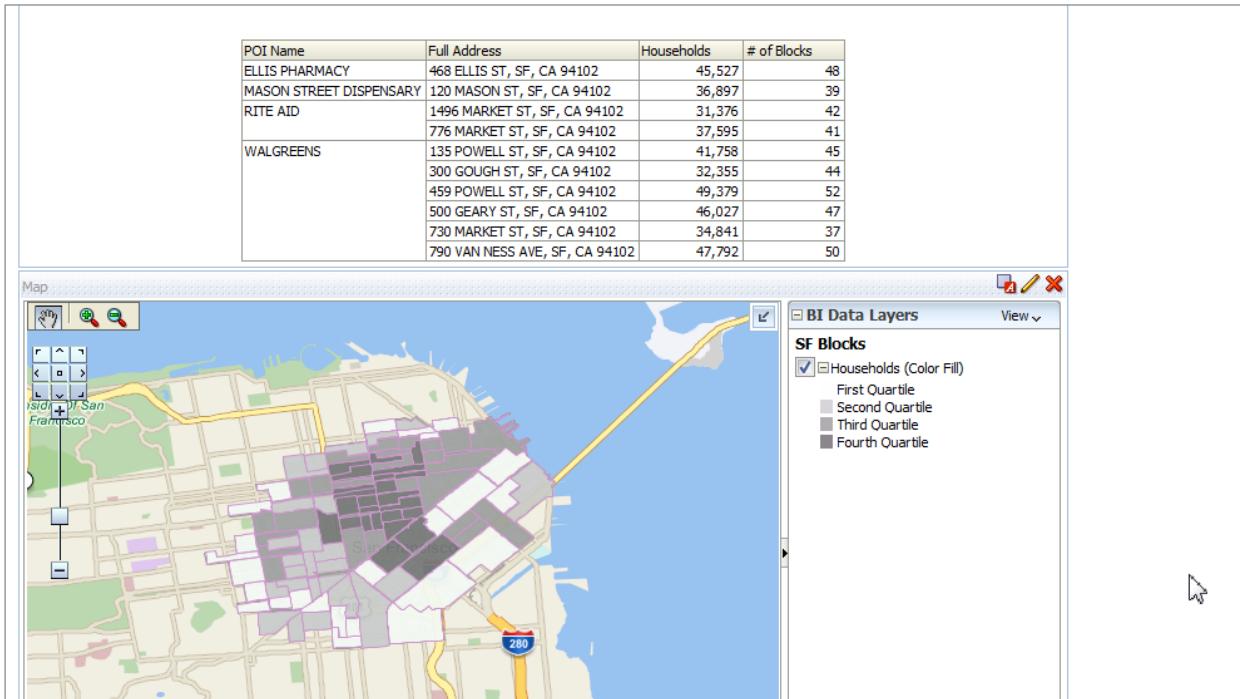
Map

Filters

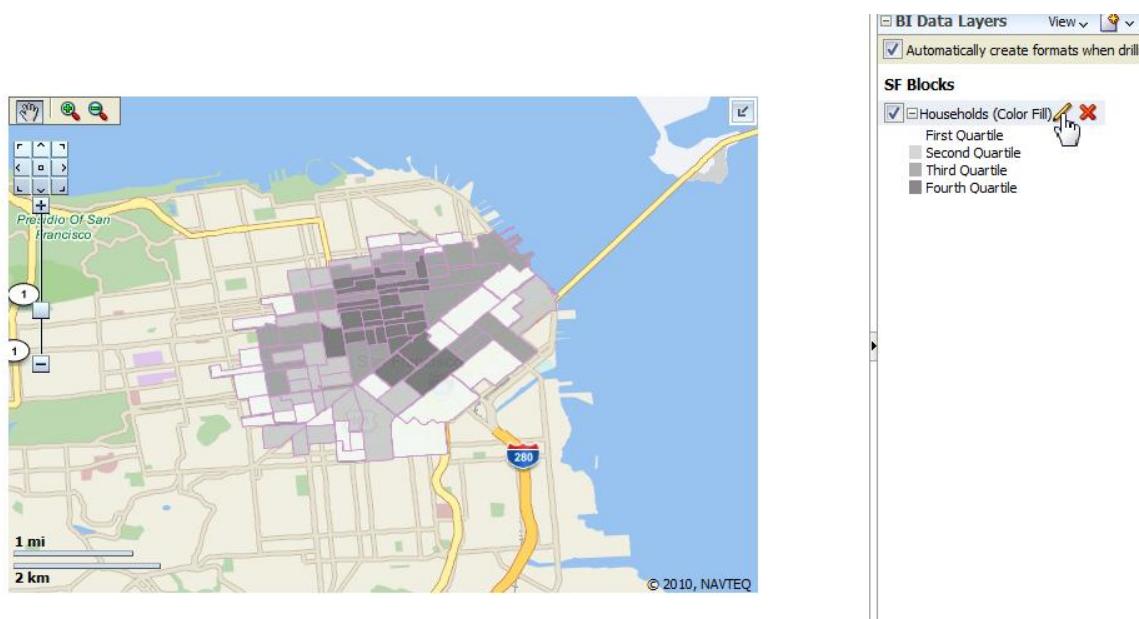
PHARMACY

POI Name	Full Address	Households	# of Blocks
ELLIS PHARMACY	468 ELLIS ST, SF, CA 94102	45,527	48
MASON STREET DISPENSARY	120 MASON ST, SF, CA 94102	36,897	39
RITE AID	1496 MARKET ST, SF, CA 94102	31,376	42
	776 MARKET ST, SF, CA 94102	37,595	41
WALGREENS	135 POWELL ST, SF, CA 94102	41,758	45
	300 GOUGH ST, SF, CA 94102	32,355	44
	459 POWELL ST, SF, CA 94102	49,379	52
	500 GEARY ST, SF, CA 94102	46,027	47
	730 MARKET ST, SF, CA 94102	34,841	37
	790 VAN NESS AVE, SF, CA 94102	47,792	50

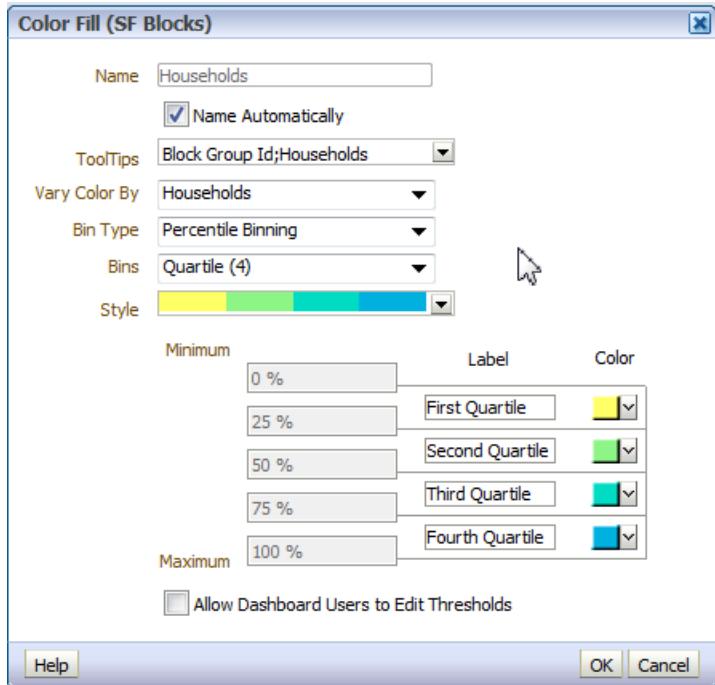
Compound Layout



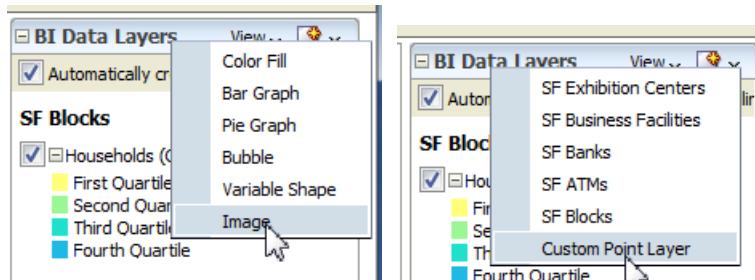
Once the map view has rendered click on Edit. You may have to navigate to San Francisco if the map view initially centers somewhere south near Sunnyvale/Cupertino or elsewhere and shows no color-fill. Use the navigation panel or simply pan down (hold down the mouse button and scroll down). Zoom in if necessary once the map is centered on SFO.



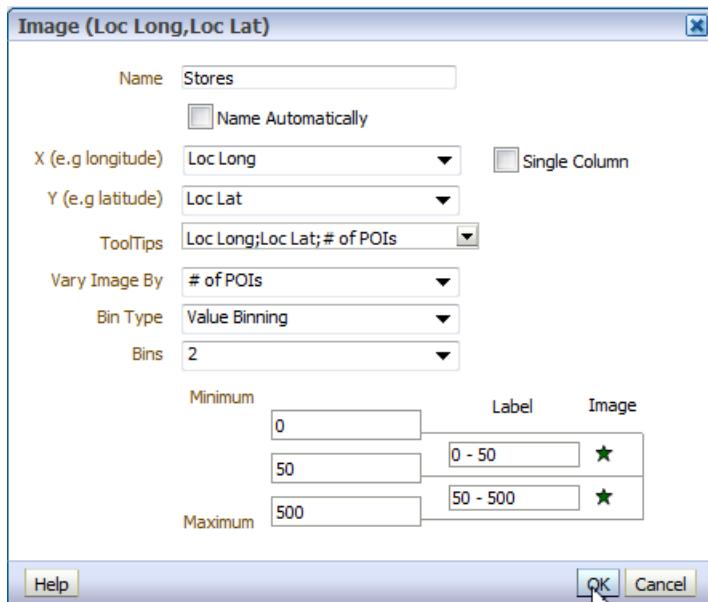
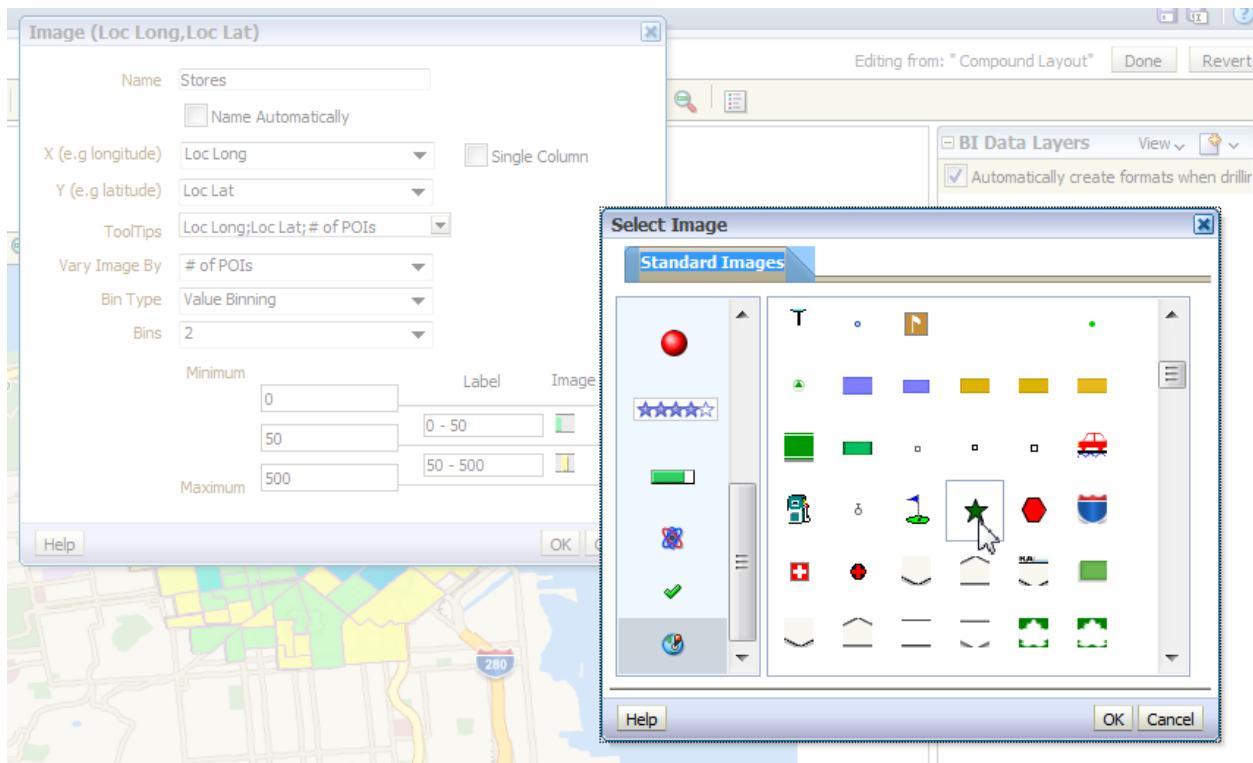
Change the color fill palette to the one shown below.



Click on the new layer icon (next to the BI Data Layers) to add a new map format to the view. Select Image and then Custom Point Layer.



When the custom point layer dialog shows up edit it as shown below. Uncheck Name automatically and name it Stores. Select Loc Long as the Longitude column and Loc lat as the Latitude column. Click on the drop down list for Vary Image By and choose "# of POIs". Select 2 and the number of Bins and change Bin Type to Value Binning. Once the default bin value ranges and labels show up edit them to the values shown. Set the ranges to 0-50 and 50-500 and enter Stores for both labels. Click on the default image, scroll down and click on the globe with pin and then choose the green star as the image. Do this for both bins.



Click on Done.

Save the analysis to your preferred folder.

Compound Layout

Title:

Table:

PHARMACY

POI Name	Full Address	Households	# of Blocks
ELLIS PHARMACY	468 ELLIS ST, SF, CA 94102	45,527	48
MASON STREET DISPENSARY	120 MASON ST, SF, CA 94102	36,897	39
RITE AID	1496 MARKET ST, SF, CA 94102	31,376	42
	776 MARKET ST, SF, CA 94102	37,595	41
WALGREENS	135 POWELL ST, SF, CA 94102	41,758	45
	300 GOUGH ST, SF, CA 94102	32,355	44
	459 POWELL ST, SF, CA 94102	49,379	52
	500 GEARY ST, SF, CA 94102	46,027	47
	730 MARKET ST, SF, CA 94102	34,841	37
	790 VAN NESS AVE, SF, CA 94102	47,792	50

Map:

BI Data Layers

Loc Long,Loc Lat

Stores (Variable Shape)

★ 0 - 50
★ 50 - 500

SF Blocks

Households (Color Fill)

First Quartile
Second Quartile
Third Quartile
Fourth Quartile

Save As

Folders

- My Folders
 - Subject Area Contents
 - My Dashboard
 - Drills
 - HOL Temp**
 - Shared Folders

Save In

/My Folders/HOL Temp

BlockMedHHIncome

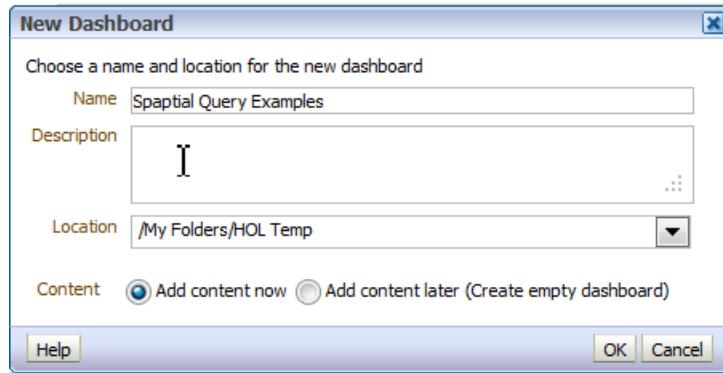
BlocksStoresHouseholds

Name:

Description:

OK Cancel

Now create a new Dashboard and add a page and then add the Blocks to Shops Distance Prompt (in the Catalog area expand the folders 8. Source Specific Features, 8.5 and then POIs in range of) and the newly created analysis to the page.



Spatial Query Examples

page 1 Blocks Near Stores

Dashboard Objects: Column, Section, Alert Section, Action Link, Action Link Menu, Link or Image, Embedded Content, Text, Folder.

Catalog: 4. Analytic Intelligence, 5. Performance Management, 6. Published Reporting, 7. Server Features, 8. Source Specific Features, 8.1 Oracle DB, 8.2 Essbase, 8.3 Oracle Olap, 8.4 Oracle Datamining, 8.5 Oracle Spatial, Distance Analysis, Distance to Landmark, POI in Range of, Address and Distance, Block to Shops Distance, Blocks Population in Range, Business POI in Distance, Direct DB SQL Query, Geocode SQL Prompt, 8.6 Oracle TimesTen, 8.7 Flat Files.

Column 1: Section 1, Block to Shops Distance Prompt.

Spatial Query Examples

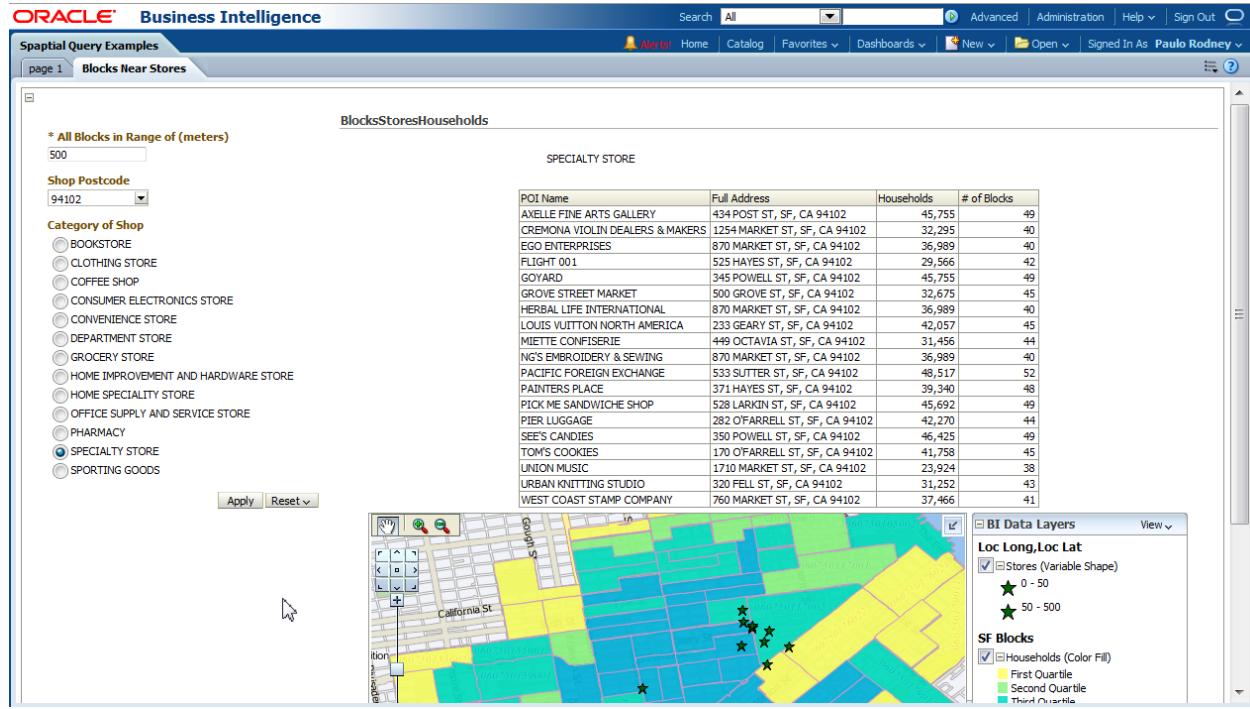
page 1 Blocks Near Stores

Dashboard Objects: Column, Section, Alert Section, Action Link, Action Link Menu, Link or Image, Embedded Content, Text, Folder.

Catalog: My Folders, Subject Area Contents, Drills, HOL Temp, Spatial Query Examples, BlockMedHIncome, BlockStoresHouseholds, KPI Report: When Avg Revenue, KPI Report: When Avg Revenue.

Column 1: Section 1, Block to Shops Distance Prompt, BlockStoresHouseholds Compound View.

Save and then run the dashboard. You should see something like the following screenshot.



Example 2: Stores near an address

This example replicates the Geocode SQL page in the dashboard named “8.5 Oracle Spatial”. It uses a Direct Database request, prompts, presentation variables, and user-defined functions in the database. We will reuse existing functions, prompts and variables.

The SampleApp dashboard screenshot is shown below. The presentation variables are used to pass in the store category (CATEGORY), the distance value (DISTANCE), and the input address (ADDRESS). The Direct database request SQL is

```
select s.poi_id store_id, s.name, s.poi_house_number || ' ' ||  
s.poi_street_name street, s.poi_phonenumber phone ,  
d.name as category_name  
from ntc_map_poi_shop s ,ntc_meta_poi_cat_ref d  
where s.cat_id = d.cat_id and d.name = '@{CATEGORY}{PHARMACY}' and  
sdo_within_distance(geometry,  
geocode_address('@{ADDRESS}{747 Howard St, San Francisco, CA 94013,  
US }'), 'distance=@{DISTANCE}{2000} unit=m')='TRUE'
```

ORACLE Business Search All Advanced Administration Help Sign Out

8.5 Oracle Geospatial Alerts! Home Catalog Dashboards New Open Signed In As weblogic Geocode SQL

Geocode Report Made of direct Physical Database SQL Query [Return to Main Index page](#)

[Page Information \(click to collapse or expand\)](#)

Type in or Select Address: 747 Howard St, San Francisco, CA 94103, US

Set Distance Range (meters): 500

Select shop type: PHARMACY

BOOKSTORE
CLOTHING STORE
COFFEE SHOP
CONSUMER ELECTRONICS STORE
CONVENIENCE STORE
DEPARTMENT STORE
PHARMACY

Shops of Type PHARMACY Within 500m of 747 Howard St, San Francisco, CA 94103, US

Time run: 8/24/2011 11:51:40 PM

of Stores in Range: 4

PHARMACY

NAME	STORE_ID	STREET	PHONE
RITE AID	38,231,490	776 MARKET ST	+(1)-415-3970837
WALGREENS	800,675,903	116 NEW MONTGOMERY ST	+(1)-415-3440891
	996,567,584	730 MARKET ST	+(1)-415-3974800
	38,223,392	825 MARKET ST	+(1)-415-5439502

Analyze -Edit -Refresh -Print -Export - Copy

Apply Reset

The presentation variables are defined as follows.

Geocode SQL Prompt

Definition

Add prompts for users when they run this analysis.

Prompt Label	Type	Prompt For	Description	Required	New Column
Page 1	Page	'AA'		<input checked="" type="checkbox"/>	
Type in or Select Address	Column value	1		<input type="checkbox"/>	
Set Distance Range (meters)	Variable value			<input type="checkbox"/>	
Select shop type					

Display

Page 1

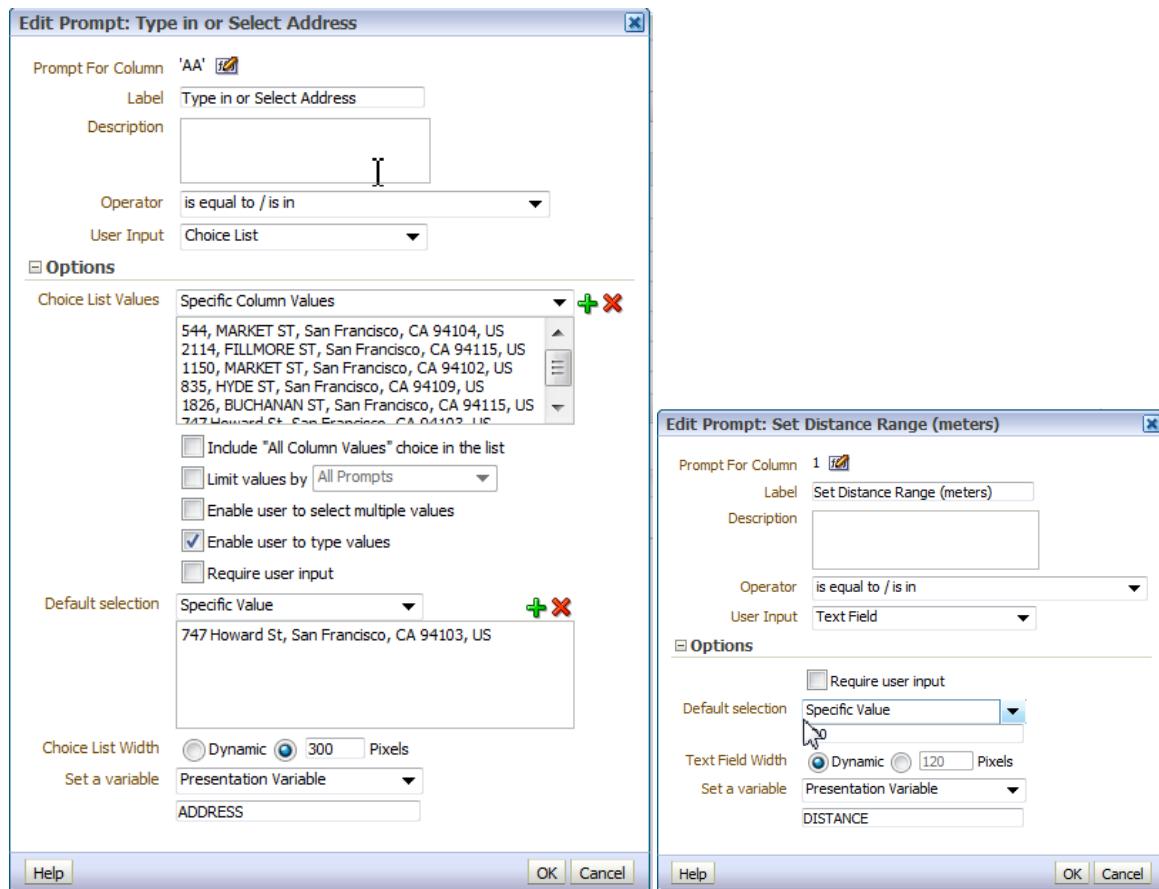
Type in or Select Address: 747 Howard St, San Francisco, CA 94103, US

Set Distance Range (meters): 500

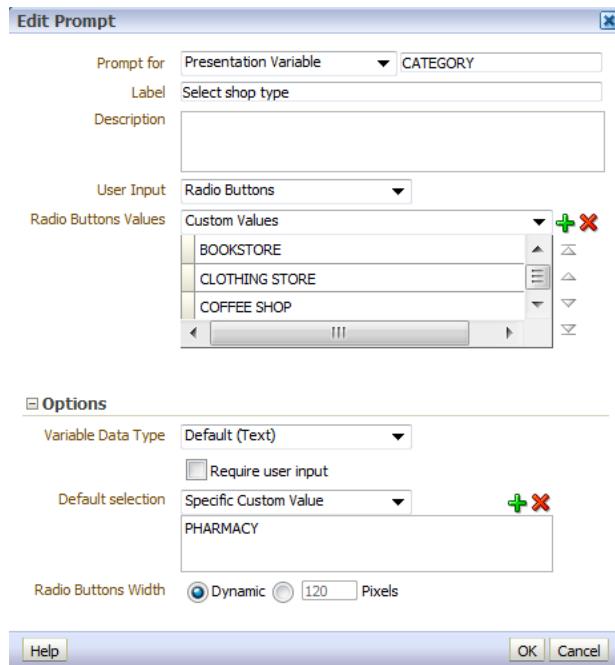
Select shop type: PHARMACY

BOOKSTORE
CLOTHING STORE
COFFEE SHOP
CONSUMER ELECTRONICS STORE
CONVENIENCE STORE
DEPARTMENT STORE
PHARMACY

The address and distance prompt definitions are



The shop category prompt is



The user-defined function `geocode_address` takes a comma delimited address string as input and in turn calls the `SDO_GCDR.GEOCODE_AS_GEOMETRY` function.

```
function geocode_address(address varchar2) return sdo_geometry deterministic
as
addr_lines      sdo_keywordarray;
an_addr_line    varchar2(128);
country         varchar2(64);
num_lines       number;
input_addr      varchar2(256);
theGeom         sdo_geometry;
begin
-- assumes address is comma delimited and is
-- house no. street,city,state and/or postalcode,country(e.g.US,UK,GB, or AU)
-- parse out the address pieces. country = from last comma onwards
-- everything except country goes into a sdo_keywordarray
-- add a comma at the end so num_commas = num sections
  input_addr := address || ',';
  addr_lines := sdo_keywordarray();
-- assume database version 11g
  num_lines := regexp_count(input_addr, ',', 1, 'i');
  addr_lines.extend(num_lines);
  for i in 1 .. (num_lines-1) loop
    an_addr_line := regexp_substr(input_addr, '[^,]+', 1,i);
    addr_lines(i) := an_addr_line ;
  end loop;
  country := regexp_substr(input_addr, '[^,]+', 1,num_lines);
  theGeom :=sdo_gcdr.geocode_as_geometry('obiee_navteq', addr_lines, country);
return theGeom;
end;
```

Geocode-as_geometry is an Oracle Spatial function. It requires reference data from a data vendor such as NAVTEQ.

Hands-on portion of the example

Next we'll create an analysis and a dashboard page using the elements described above.

Click on new Analysis and then Create Direct Database request. Enter `obiee_navteq` for the Connection Pool and the SQL text given above in the SQL Statement area. Check the Bypass Oracle BI Presentation Service cache and then on the button titled Validate SQL and Retrieve Columns.

Your page should look like the one shown below.

The screenshot shows the Oracle Business Intelligence SQL Prompt window. The 'Criteria' tab is selected. In the 'Subject Areas' section, there is an 'Invalid Subject Area' message: 'The selected request cannot be performed because it references an unknown subject area named .'. The 'SQL Statement' section contains the following geocode SQL statement:

```

select s.poi_id store_id, s.name, s.poi_house_number || ' ' || s.poi_street_name
street, s.poi_phonenumber phone,
d.name as category_name
from ntc_map_poi_shop s ,ntc_meta_poi_cat_ref d
where s.cat_id = d.cat_id and d.name = '@{CATEGORY}{PHARMACY}' and
sdo_within_distance(geometry,
geocode_address('@{ADDRESS}{747 Howard St, San Francisco, CA 94013,
US}'), 'distance=@{DISTANCE}{2000} unit=m')='TRUE'

```

The 'Result Columns' section shows the following schema:

STORE_ID	NAME	STREET	PHONE	CATEGORY_NAME
double	varchar	varchar	varchar	varchar
<input type="button" value="�"/>				

Bypass Oracle BI Presentation Services Cache

Click on Results.

The screenshot shows the Oracle Business Intelligence Results window. The 'Results' tab is selected. In the 'Subject Areas' section, there is an 'Invalid Subject Area' message: 'The selected request cannot be performed because it references an unknown subject area named .'.

The 'Table' section displays a grid of data with the following columns: STORE_ID, NAME, STREET, PHONE, and CATEGORY_NAME. The data includes various store entries, mostly Walgreens and Wellman's Pharmacy locations.

STORE_ID	NAME	STREET	PHONE	CATEGORY_NAME
800,676,212	WALGREENS	456 MISSION ST	+(1)-415-3489600	PHARMACY
800,675,917		275 SACRAMENTO ST	+(1)-415-3625227	PHARMACY
800,675,920		33 DRUMM ST	+(1)-415-9896116	PHARMACY
800,675,928		88 SPEAR ST	+(1)-415-8560733	PHARMACY
38,224,037		141 KEARNY ST	+(1)-415-8340356	PHARMACY
38,225,997		100 SANSCHE ST	+(1)-415-3622768	PHARMACY
801,059,849	WELLMAN'S PHARMACY	1053 STOCKTON ST	+(1)-415-3623622	PHARMACY
38,223,252	CHINATOWN MEDICAL PHARMACY	823 JACKSON ST	+(1)-415-3977300	PHARMACY
801,058,604	DING JUEN DRUG STORE	750 PACIFIC AVE	+(1)-415-6779698	PHARMACY
38,224,755	WELLMAN'S PHARMACY	728 PACIFIC AVE	+(1)-415-7888882	PHARMACY
38,227,122	WALGREENS	300 MONTGOMERY ST	+(1)-415-7882384	PHARMACY
38,223,219	PUBLIC DRUG CO.	704 GRANT AVE	+(1)-415-9828641	PHARMACY
38,222,527	MANDARIN PHARMACY	929 CLAY ST	+(1)-415-9899292	PHARMACY
996,567,384	WALGREENS	730 MARKET ST	+(1)-415-3974800	PHARMACY
800,675,903		116 NEW MONTGOMERY ST	+(1)-415-3440891	PHARMACY
38,223,282		1344 STOCKTON ST	+(1)-415-9816274	PHARMACY
800,675,929		670 4TH ST	+(1)-415-8560543	PHARMACY
38,223,392		825 MARKET ST	+(1)-415-5439502	PHARMACY
38,231,490	RITE AID	776 MARKET ST	+(1)-415-3970837	PHARMACY
38,230,248	MASON STREET DISPENSARY	120 MASON ST	+(1)-415-4334420	PHARMACY
38,223,439	WALGREENS	135 POWELL ST	+(1)-415-3917222	PHARMACY
38,223,901	BROEMMEL'S FOUR FIFTY SUTTER PHARM	450 SUTTER ST	+(1)-415-3924137	PHARMACY
800,675,922	WALGREENS	459 POWELL ST	+(1)-415-9840793	PHARMACY
38,224,703	ELLIS PHARMACY	468 ELLIS ST	+(1)-415-4415088	PHARMACY
38,223,952	WALGREENS	500 GEARY ST	+(1)-415-6738413	PHARMACY

Rows 1 - 25

And save the analysis. Open the previous dashboard (the Spatial Query Examples created in the example above) for edit and add a new page. Add the saved analysis and the Geocode SQL Prompt (from the folder named POIs in rage of) to the page. Save and run the dashboard.

STORE_ID	NAME	STREET	PHONE	CATEGORY_NAME
996,567,584	WALGREENS	730 MARKET ST	+(1)-415-3974800	PHARMACY
800,675,903		116 NEW MONTGOMERY ST	+(1)-415-3440891	PHARMACY
38,223,392		825 MARKET ST	+(1)-415-5439502	PHARMACY
38,231,490	RITE AID	776 MARKET ST	+(1)-415-3970837	PHARMACY

Example 3: Distance between locations

This example replicates the Cust Distance SF page in the dashboard named "8.5 Oracle Spatial". It uses the EVALUATE function in a column formula, prompts, presentation variables, and database functions. We will reuse existing functions, prompts and variables.

The example here will only describe the use of EVALUATE in a column formula to determine the distance between two points specified using Longitude, Latitude coordinates. It won't replicate the analysis or dashboard page shown below.

ORACLE Business Intelligence

8.5 Oracle Geospatial

Business in Distance Range | Blocks in Distance Range | Range to Landmark | **Cust Distance SF** | Geocode SQL | Cust Distance Lon | Cust Distance Syd

Point to Point Distance : Office to Customers

Page Information (click to collapse or expand)

Description : On this dashboard, OBIE calculates the distance between offices location and customers of these offices. Select offices in the city, and see the list of the customers show on the map with their distance to their offices.

Office to Customer Distance
Time run: 8/24/2011 11:51:29 PM

City: San Francisco

Office:

- Casino Office
- Eiffel Office
- Merrimon Office
- Perry Office

Apply | Reset

Office to Customer Distance

Distance in Meters | 1- Revenue

	Distance in Meters	1- Revenue
Addison Hurd	5,165	10,296
Arentina Downey	8,375	60,655
Bertha Oddell	8,090	30,295
Biddy Ross	6,993	81,645
Colburn Tillman	5,583	11,929
Enos Silvis	12,573	61,305
Geraldine Gentle	3,483	3,371
Henry Dunbar	4,286	1,691
Jimmy Lease	1,759	5,795
Lauren	8,139	2,492

Map of San Francisco showing the distance from various offices to a customer named Carroll Ridgeway. The map includes street names like Geary Blvd, Market St, and 101, and neighborhoods like the Mission District and Potrero District. A yellow line connects the office locations to the customer's location. Text on the map includes:

1- Revenue
35,002
C65 Longitude -122.41753
C64 Latitude 37.77653
C1 Customer Name Carroll Ridgeway

2,000 ft | 500 m

© 2010, NAVTEQ

Hands-on portion of the example

Click on new Analysis and select the Sample Sales subject area. Add the columns shown below (except the Distance in Meters one) to the analysis.

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, formula and filters, apply sorting, or delete by clicking or hovering over the button next to its name.

Offices	Customers	Distance	Base Facts	Cust Geo Codes	Office Geo Codes
D1 Office	C1 Customer Name	Distance in Meters	1- Revenue	C64 Latitude	C65 Longitude

Add a Filter for D55 City and C55 City is equal to/is in San Francisco click on Results.

Untitled

Criteria | Results | Prompts | Advanced

Subject Areas

- A - Sample Sales
 - Time
 - Products
 - Offices
 - Office Regions
 - Office Geo Codes
 - D61 Iso Country
 - C62 Ctry Cd3 State N
 - C63 Ctry Cd3 State N
 - D64 Latitude
 - D65 Longitude
 - D67 Geo Postal Code
 - D1 Office
 - D2 Department
 - D3 Organization
 - D4 Company
 - Offices Hierarchy
 - Sales Person
 - Customers
 - Cust Regions
 - Cust Geo Codes

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to reorder them. Edit a column's properties, formula and filters, apply sorting, or delete by clicking or hovering over the button next to its name.

Offices	Customers	Distance	Base Facts	Cust Geo Codes	Office Geo Codes
D1 Office	C1 Customer Name	Distance in Meters	1- Revenue	C64 Latitude	C65 Longitude

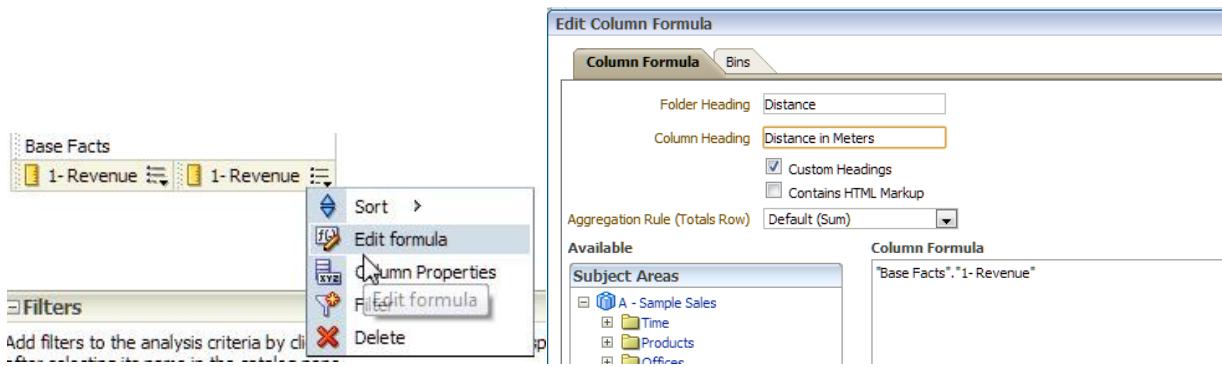
Filters

Add filters to the analysis criteria by clicking on Filter option for the specific column in the Selected Columns pane, or by clicking on the filter button in the Filter pane header. Add a saved filter by clicking on add button after selecting its name in the catalog pane.

D55 City is equal to / is in San Francisco
 AND C65 Longitude is not null
 AND D65 Longitude is not null
 AND C55 City is equal to / is in San Francisco

Modify the data format to include 3 decimal values for the D65 Longitude and D64 Latitude columns so that the Longitude/Latitude values are not truncated. That is, click on Column Properties, Data Format, Override default number format, set decimal places to 3, and uncheck Use 1000's separator.

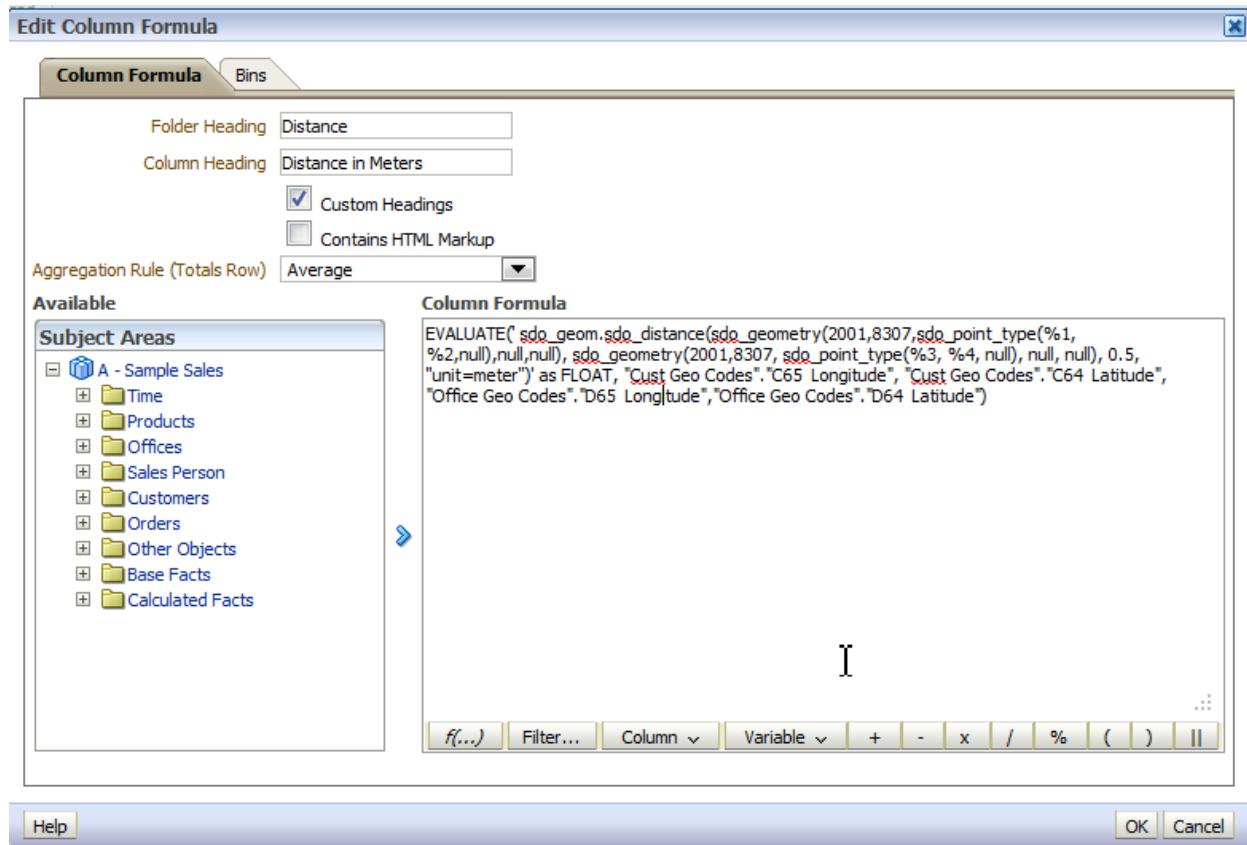
Add filters for C65 Longitude is not null and D65 Longitude is not null. Add another column for the distance. Drag and drop another copy of Base facts 1 – Revenue for example. Edit its formula and check Custom Headings. Set Folder name to Distance and column name to Distance in Meters.



Click OK and then edit the column again to set its formula.

Set the column formula to

```
EVALUATE(
sdo_geom.sdo_distance(sdo_geometry(2001,8307,sdo_point_type(%1, %2,null),null,null), sdo_geometry(2001,8307,
sdo_point_type(%3, %4, null), null, null), 0.5, "unit=meter") as
FLOAT, "Cust Geo Codes"."C65 Longitude", "Cust Geo
Codes"."C64 Latitude", "Office Geo Codes"."D65
Longitude", "Office Geo Codes"."D64 Latitude")
```



This uses the database function `sdo_geom.sdo_distance()` to compute the distance in meters between the two points. The `SDO_GEOmetry` object constructor used in the `sdo_distance` function creates a point geometry instance. It takes 5 parameters. The first (2001) specifies that the geometry is a 2-D point. The second (8307) identifies the spatial reference system (WGS84 Longitude/Latitude in this case. AKA GPS coordinates). The third creates a point using the supplied Longitude and Latitude values. The fourth and fifth parameters are null here. They're used when defining lines, polygons, or collections.

Click OK and then on the Results tab.

Compound Layout

Title

Table

D1 Office	C1 Customer Name	Distance in KM (pythagoras)	C65 Longitude	C64 Latitude	D65 Longitude	D64 Latitude	sdo_distance(meter)	
Casino Office	Addison Hurd	5.17	-122.438	37.784	-122.465	37.743	5,165	
	Arentina Downey	8.38	-122.402	37.799	-122.465	37.743	8,375	
	Bertha Oddell	8.09	-122.400	37.794	-122.465	37.743	8,090	
	Biddy Ross	6.99	-122.408	37.786	-122.465	37.743	6,993	
	Colburn Tillman	5.59	-122.433	37.786	-122.465	37.743	5,583	
	Enos Silvis	12.59	-122.412	37.637	-122.465	37.743	12,573	
	Geraldine Gentle	3.48	-122.440	37.718	-122.465	37.743	3,483	
	Henry Dunbar	4.29	-122.462	37.781	-122.465	37.743	4,286	
	Jimmy Lease	1.76	-122.482	37.734	-122.465	37.743	1,759	
	Lauren Green	8.15	-122.469	37.669	-122.465	37.743	8,139	
	Merrill Young	4.21	-122.443	37.776	-122.465	37.743	4,205	
	Nason Markerman	8.38	-122.402	37.799	-122.465	37.743	8,375	
	Philip Mendel	5.23	-122.447	37.787	-122.465	37.743	5,218	
	Rolf Grier	8.04	-122.411	37.801	-122.465	37.743	8,038	
	Webster Felton	2.99	-122.450	37.767	-122.465	37.743	2,987	
	Zaccheus Zoldos	5.63	-122.418	37.777	-122.465	37.743	5,630	
	Eiffel Office	Anna Groves	6.84	-122.418	37.749	-122.407	37.688	6,831
		Chris Lacoste	5.28	-122.428	37.644	-122.407	37.688	5,271
Dragan Nikolic		12.70	-122.493	37.780	-122.407	37.688	12,693	
Duke Rivera		5.22	-122.391	37.733	-122.407	37.688	5,216	
Elaine Hazleton		4.86	-122.462	37.693	-122.407	37.688	4,867	
Emerald Oxford		11.58	-122.398	37.792	-122.407	37.688	11,558	
Jennifer Cole		6.10	-122.398	37.634	-122.407	37.688	6,085	
Ken Bass		11.86	-122.420	37.794	-122.407	37.688	11,840	
Marylou Clatterbuck		10.79	-122.485	37.763	-122.407	37.688	10,789	

↑
↓
Rows 1 - 25

You can also choose to use some other function to compute the distance between two Longitude/Latitude pairs. For example, the Pythagoras theorem on an equiangular projection as described at the website

<http://www.movable-type.co.uk/scripts/latlong.html>

The formula is

$$x = \Delta\text{lon}.\cos(\text{lat})$$

$$y = \Delta\text{lat}$$

$$d = R.\sqrt{x^2 + y^2}$$

where $R = 6371$ Km, the approximate radius of the earth at the equator. The latitude.longitude values must be in radians (e.g. $\text{D55 Longitude} * 180/\text{PI}$ in this case). The column formula then becomes

```
SQRT(((("Office Geo Codes"."D65 Longitude" * (180/PI())) - ("Cust Geo Codes"."C65 Longitude" * (180/PI())))*COS(( ("Office Geo Codes"."D64 Latitude" * (180/PI())) + ("Cust Geo Codes"."C64 Latitude" * (180/PI())))/2)) * (((("Office Geo Codes"."D65 Longitude" * (180/PI())) - ("Cust Geo Codes"."C65 Longitude" * (180/PI())))*COS((("Office Geo Codes"."D64 Latitude" * (180/PI())) + ("Cust Geo Codes"."C64 Latitude" * (180/PI())))/2)) + ((("Cust Geo Codes"."C64 Latitude" * (180/PI()) - "Office Geo Codes"."D64 Latitude" * (180/PI())) * ("Cust Geo Codes"."C64 Latitude" * (180/PI()) - "Office Geo Codes"."D64 Latitude" * (180/PI())) ) * 6371
```