UNIVERSITY
of
GLASGOW

Management Information Services

Research System

BI/Query Model course

Notes, Exercises and Solutions

Query Notes

Creating Queries: When starting off to write your own queries the first thing to do is decide on exactly what you want the final report to look like, particularly in terms of what information is to be included. Next find out where on the model the data you need can be found. This will become easier once you get more practice of using the model.

Next, start off your query simply; i.e. do not include too much data to be displayed, and if possible start with a single table. At the outset also do not include functions such as SUM, but just run the query displaying all the data un-summarised. It can be very useful sometimes just to look at the data and convince yourself that you are getting all the data out correctly. Once you are happy with the data then you can start joining to other tables and including the necessary functions such as SUM, but at each step ensure that you are still getting out what you consider to be the correct data.

Once you are completely satisfied that you are getting the data you want, then if necessary you can take the data into a "report" and format it the way you want it displayed. Finally, save the query (using the **Query** / **Save** menu option) so that you can use it again.

If possible, use "prompts" to try to make your queries are general as possible, so that they can be re-used in different situations. Using Prompts is covered in the BI/Query basic courses.

Case Sensitivity: The underlying database system is case-sensitive, so when you qualify a query you need to use the correct case. For example, a qualification entered as "abc" would be different to that entered as "ABC".

Query Efficiency: Some queries seem to take a long time while others are quite fast. Always try to qualify as many attributes as you can as this will generally make the queries more efficient. Try to avoid qualifying descriptive attributes as these tend to cause fairly inefficient queries.

Exercise Notes

Unless otherwise stated in the exercise, you should always clear the old query before starting to create a new one. To clear the old query use the **Query** / **New Query** menu option (or Control-N).

There are a number of separate questions in each exercise. Please try to get as many done as possible, but don't worry if you don't get them all completed. The important thing is that you understand what you are trying to do.

There are some worked examples after the exercises (if you find that you are totally lost!).

A convention has been used throughout the exercises where the table names are underlined, the attribute names are in *italic*, and any functions or actual values to be entered are in **bold**.

Exercises

Exercise 1 – Logging On

a) Start BI/Query User.

b) Find and open the model.

c) Find the correct connection file and make a connection.

Exercise 2 – Projects

a) Build a query to extract a list of all the projects that you are allowed to access, including in the list the *project ID* and *title*.

b) Run the same query again, but this time select only those projects having the word **disease** somewhere in the title.

Exercise 3 – Project People

a) Produce a query to list all projects that you have access to together with the names of the people working on them.

b) Run the query again, this time just for Principal Investigators (PIs), and include the *department* and *faculty name* together with the *percentage ownership*.

Exercise 4 – Awards

a) Create a query to list all the awards and the total award values for a particular department. Display the *department name* and the *project award code* and *value of award (ex VAT)* (from Award). Try to ensure that you display each award only once in the results. (Remember that if you link to the Project Person table in a query and there is more than one project person on a project, then that project may be listed more than once in the results. Similarly, there could be more than one award for a project.)

b) Run the same query, but this time include the *funder name*.

Exercise 5 – Proportioned award values

a) List all project people (*full name*) in a department of your choice together with their overall total proportioned award value. The proportioned award value is a split of the award value proportioned by the percentage ownership the person has of the project. In this example, instead of using the *value of award (ex VAT)* attribute in a calculation with *percentage ownership 2*, use the ready-made calculated field *proportioned value*.

b) Sort the results so that the person with the highest award value appears at the top of the list.

c) Retain the previous query, but 'drill down' to find out more details (*project award code* and *project title*) of the actual awards that were included in the overall total figure. Apply a sort order, first by *full name* and then by *project award code*.

d) You may not be interested in the rows where *proportioned award value* is zero. Modify the query to exclude those results.

Exercise 6 – Budgets

a) List the Budget details for a project/award of your choice. Display all attributes in the Award Budget table except *proportioned value*.

b) List the Award Budgets for a particular department for a particular financial year by expense type group. List only the e*xpense type group name* and the total (**SUM**) of the *proportioned value* (the value proportioned to the department). This query may take minutes to run.

c) Repeat the query, this time including Count Distinct *project award code* so you can see whether the amount is for one award or split between several.

Exercise 7 – Running pre-defined queries

a) Run a pre-defined query of your choice.

Suggested Solutions

Exercise 1

a) Start BI/Query…

- Either double-click on the **BI/Query User** icon on the desktop (if there is one), or go to the **Start** menu → **BI/Query** → **BI/Query User**

b) Open the model…

- Click on the **File** / **Open** menu.
- Browse (if necessary) to the correct directory and find the correct model. Click on this and press the **Open** button.

c) Make a connection…

- Click on the **Host** / **Connect** menu option or the **Connect** button.
- In the **Enter Connection Information** box, ensure that the connection is displayed as **r_biq1.con**. Enter your user-id and password and click **OK**.
- If the wrong connection file is displayed, click on the **Cancel** button and use the **Host/Connections** menu item to locate the correct connection file (**r_biq1.con**). You may need to **Browse** to the directory in which the model is installed and find the correct connection file. Click on the connection file and press the **Connect** button. In the **Enter Connection Information** box, enter your user-id and password and click **OK**.

Exercise 2

a) Retrieving all Projects…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open the Project table.
- Select *project id* and *project title*.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

b) Retrieving Projects that have something to do with **disease**…

- Retain the query that you created in the previous example.
- This time qualify the *project title* field (click in the yellow box alongside the field, select the 'contains' operator, and type **disease** in the qualification tree box).

Exercise 3

a) Retrieving all Projects with their people…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open the Project table.
- Select *project id*.
- Close the Project window.
- Open the Project Person by Dept/Faculty table and select the *full name* field. This is just a convenient means of displaying the person's title, surname and forename in one column.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

b) Retrieving all Projects with details of their respective Principal Investigators…

- Retain the query that you created in the previous example.
- Open the Project Person by Dept/Faculty table.
- Qualify the *project person role* field (click in the yellow Qualify box alongside the field and type **PI** in the qualification tree box that pops up in the bottom of the window).
- Now select the other attributes against Project Person by Dept/Faculty before submitting the query **(Query/ Submit Query,** or **CTRL-G)**.

Exercise 4

a) Retrieving basic Award details for a Department…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open the Project Person by Dept/Faculty table.
- Qualify the *department code* with the code of the department that you are interested in.

- Close the window.
- Click on the relationship line connecting the Project Person by Dept/Faculty table to the Project table.
- Open the Award window.
- Select the *project award code* and the *value of award (ex VAT)*.
- In the function box for *value of award (ex VAT)*, select the **SUM** function. This will sum the value for every award associated with each project.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

b) Including Award Funder information in the results…

- Retain the query that you created in the previous example.
- Open the Funder table.
- Select the *funder name* attribute from the Funder table.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

Exercise 5

a) Retrieving total proportioned Award values for Project People…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open the Project Person by Dept/ Faculty table.
- Qualify the *Department Code* with the code for your department.
- Select *full name.*
- Close the Project Person by Dept/ Faculty table.
- Single-click on the relationship line between Project Person by Dept/Faculty and Project.
- Open the Award table.
- Select *proportioned value.*
- Click in the Function box against *proportioned value* and select **SUM**.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

b) Sorting the results, highest earner first…

- Click on the **Results** menu and choose **Filter / Sort**.
- In the Sort Order window, select the *SUM proportioned value* column and click on the 'Move' button to move this column into the 'Sort Order' box.
- Click on the 'Descending' button and note that the arrow next to the selected column is now pointing down.
- Click on 'OK'.

c) 'Drilling down' from previous query…

- Retain the query that you created in part a). Note that the sorting operation applied in part b) has not been applied to the query itself, but only to the results.
- Open the Award table.
- Click on 'SUM' in the Function box against *Proportioned Value* and select **none**.
- Open the Project Person by Dept/ Faculty table.
- Click in the Group box against *full name* to remove the grouping against this attribute. Note that this grouping was created automatically when the SUM function was applied in part a).
- Click in the Sort box against *full name* to sort the results by Project Person name. '1' should be displayed in the box, indicating that this is the primary sort column.
- Open the Award table and select *project award code*.
- Click in the Sort box against *project award code* to sort the results by Project / Award. '2' should be displayed in the box, indicating that this is the secondary sort column (after *full name*).
- Open the Project table and select *project title*.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

d) Excluding awards with zero value…

- Retain the query that you created in part c).
- Open the Award table.
- Click in the Qualify box against *proportioned value*. In the qualification tree box that pops up in the bottom of the window, select the 'Greater Than' operator (>) and type **0**.

Exercise 6

a) Retrieving all budget data for a project/award of your choice…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open Award Budget and qualify the *project code* and *award number*.
- Select all the attributes in the table except *proportioned value*.
- Sort by *financial year*.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

b) Retrieving departmental research project budget values for a financial year…

- Start a new query (**Query** / **New Query,** or **CTRL-N**).
- Open Project Person by Dept/Faculty and qualify the *department code*.
- Single-click on the relationship line between Project Person by Dept/Faculty and Project.
- Single-click on the relationship line between Project and Award.
- Single-click on the relationship line between Award and Partner
- Open the Award Budget table and qualify *financial year* with e.g. = **2007**.
- Select *expense type group name* and *proportioned value*.
- Click on the Function box against the *proportioned value* and select **SUM**.
- Sort by *expense type code name*.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

c) Including a count of Awards…

- Retain the query that you created in the previous example.
- Open the Award table and select *project award code.* Select **Count Distinct** from the function box next to this attribute.
- Submit the query **(Query/ Submit Query,** or **CTRL-G)**.

Exercise 7

a) Running pre-defined queries…

- Click on the Queries button and view the Pre-defined Queries menu.
- Choose an area you wish to visit, click on that button.
- Choose a query to run by clicking on the button and filling in the parameters as required.