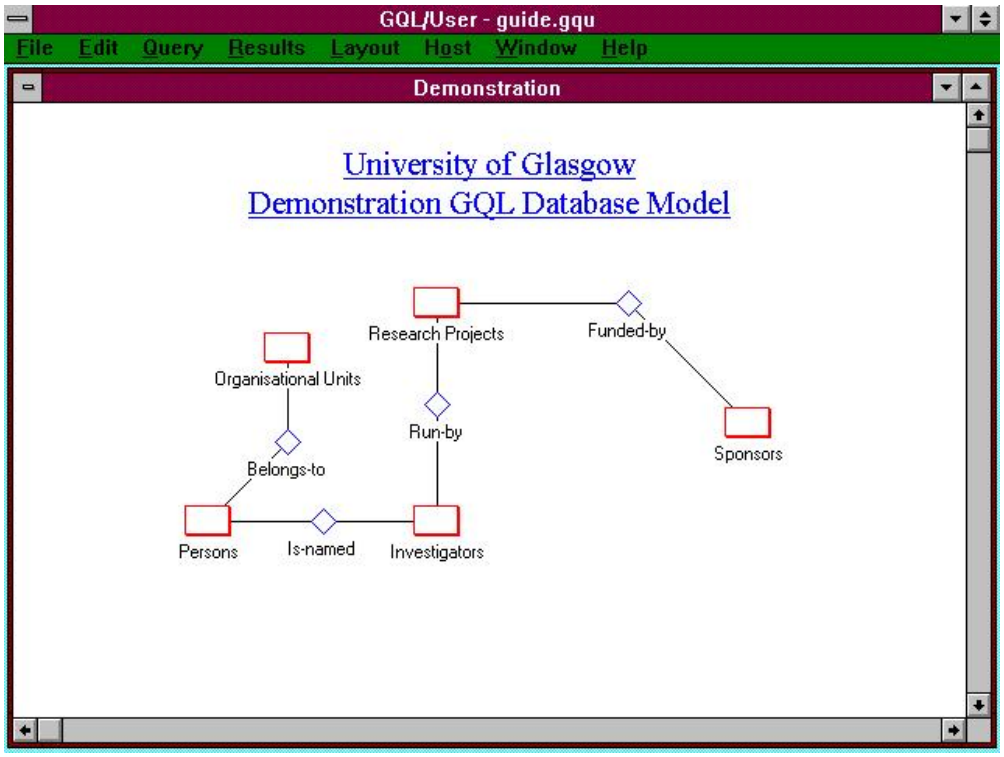
BI/Query Basic Course

Course Notes
and
Examples

1 - Opening a Model and Making a Connection

The first thing you require to do is open BI/Query. You must then open a data model and make a connection to the central computer where the database resides.

- Click on the BI/Query User icon under Start, Programs, BI/Query (GQL). A window displaying a humming bird will be displayed and then a 'Welcome to BI/Query' screen.
- Select the 'Local Data Model' option.
- An 'Open Data Model' window will be displayed. Using the arrow at the right hand side of the 'Look in:' box, select the c: drive,Program Files, gql, models, training.
- Select the model **guide.gqu -** either double-click on it or click on it and select the **OK** button.
- Eventually the model should be displayed and look like the following:



All that you have done so far is to start BI/Query and open a data model. You must now connect to the machine where the database resides.

- Select the **Host** drop-down menu from the top of the window.
- Select **Connections**. There is a different connection file for each of the models you may wish to access as the database associated with each are held on different machines.
- Either double-click on the **guide.con** connection, or select it and then press the **Connect** button.
- A 'Connection' window will be displayed with a 'bullet' at the side of **guide.con**.
  Click on the **Connect** button.

- The 'Enter Connection Information' screen will be displayed. Enter your **user id** and **tab** to enter your **password.**
- The message 'Connecting to Ingres via TCP/IP' will be displayed and then the model window will return.

2- Breaking the Connection again.

When you are finished running queries, remember to disconnect your session from the machine your database is held on.. Try this now.....

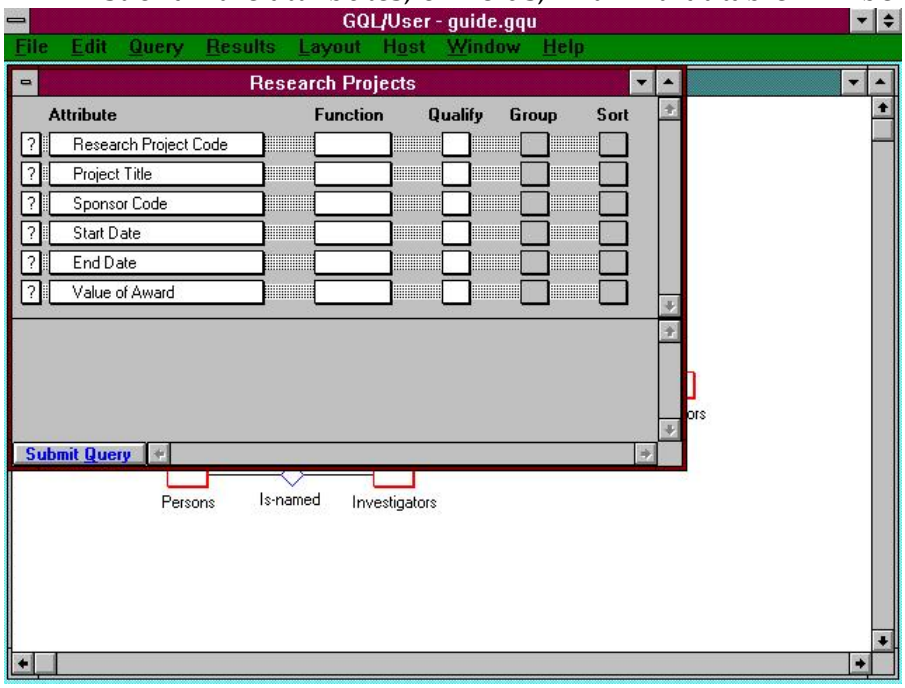
- Select the **Host** pull-down menu from the menu at the top of the window.
- Select the **Disconnect** option, or click on the green and blue icon(10th icon from the left) to disconnect from the central computer.
- Close the model window.
- Finally, under **File** you can select **Exit** to close BI/Query or click on the **X** in the top right-hand corner of the screen.

It is important that you carry out this procedure properly. Do not simply close the window on your PC without disconnecting. This can leave sessions connected to the database and may cause problems for other users.

- Now connect to the central computer again using the steps on Page 2 and then go to page 4 to start the examples..

3 - Running a Simple Query on One Table

- Double-click on the Research Projects table.
- A list of all the attributes, or fields, within that table will be displayed....



- Click on the attributes *Research Project Code* and *Project Title*. These attributes willchange to bold type and have a bullet on the left-hand side.
- Just below the menu options at the top of the screen, you will see an icon, 7th from the left, in the format of **'traffic lights'** at green. Click on this icon. This will submit your query to the database. You can also use the **Query** drop-down menu option at the top of the screen and select the first **Submit Query** (Ctrl+G).
- Another window will be displayed (called Query Results n) and the results of the query will be shown in this window. Nine records should be displayed.

The attributes you selected are displayed as columns, and one row is displayed for each record retrieved from the database.

- Close the results window and the Research Projects window. (To close a window click on the box at the top-left of the window (Control-menu box) and select Close from the menu or click on the **X** at the right-hand side of the window. Do not do this with the main model window!)
- The query you have defined (which is simply to retrieve all project codes and titles in the database) is still there. You could run the query again by pulling down the Query menu and selecting the first Submit Query option from there or click on the **'traffic light'** icon. Try this.
- However, if you want to start a new query, close the results window(this will automatically return to the attribute window). Select the **Query** pull-down menu at the top of the screen and click on the **New** option or click on the '**paintbrush**' icon, 9th from the left. This clears the current query. Do this now.

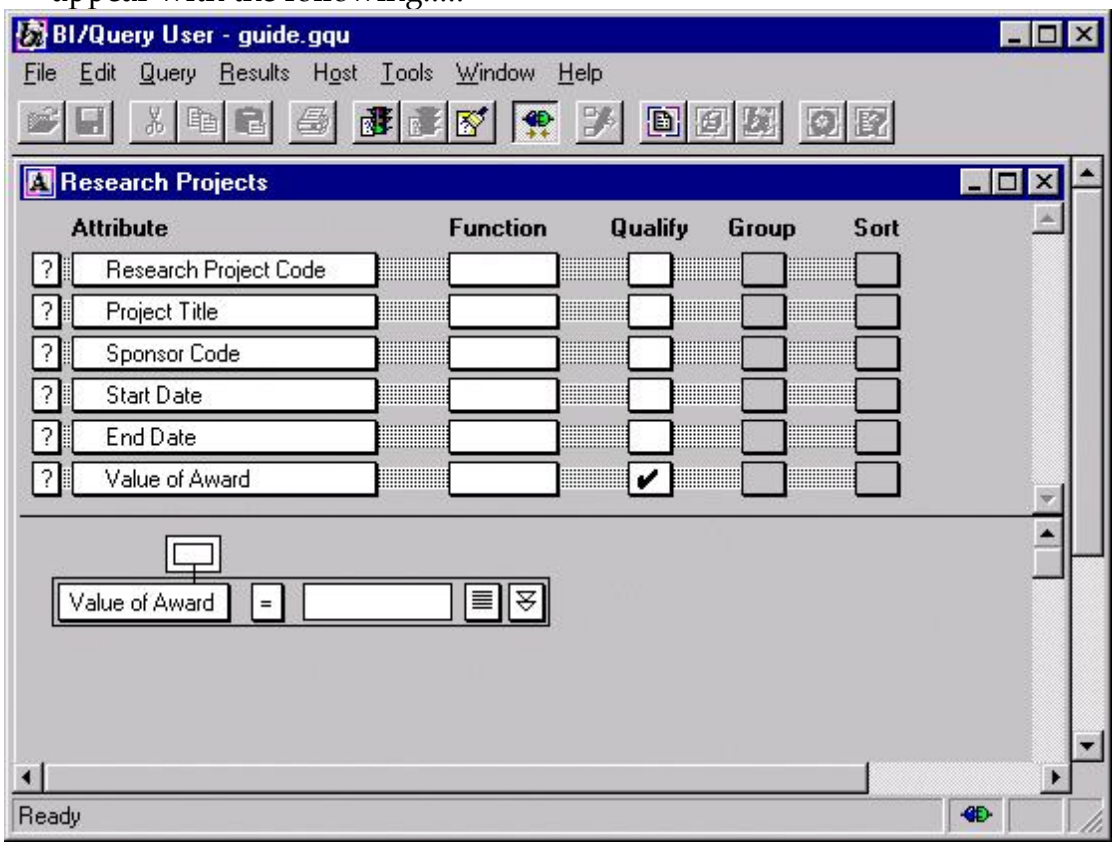
This is certainly a simple way of running a query, but it is not very selective. In this example you retrieved all the records in that table. This is fine as long as there are not too many records, but in many of the databases there are tables with hundreds of thousands of records in them. You will need to try and restrict your queries (or qualify them) to reduce the amount of information returned.

Qualifying Numeric and Date Fields:

- Start a new query, if you have not already done so (**Query/New Query** or click on the '**paintbrush**' icon).
- Open the Research Projects table window.
- Select *Research Project Code*, *Project Title* and *Value of Award*.

It may be that you wish to look at all projects where the value of the award is, say, greater than 5000. To do this you must **qualify** the query. One of the columns on the attribute window is headed **Qualify.**

- Click the Qualify box against the Value of Award attribute. A check mark should appear in the box and at the bottom of the window a field will appear with the following.....



- The cursor is in the right-hand box. Type in the number 5000.
- **Submit** this query.

You should get a message back saying that no data has been found for this query. The reason for this is that you have submitted a query which, in effect, says....

display all project codes, titles and values where the value of award is **equal-to** 5000.

The important part here is the **equal-to**. The query has returned no data as it has found no *Value of Award* = 5000. What we do want to say in the next example is ...

display all projects codes, titles and values where the value is **greater-than** 5000.

- Close the results window. This will return to the 'Attributes' window.
- Click on the = sign between the attribute name (*Value of Award*) and the value which you have entered (5000). A list of the possible options will be displayed one of which is **>** (greater than).
- Select this one (**>**).
- **Submit Query** again and this time you should get some results, but fewer than the query with no qualifications.

Try some other qualifications on the query. Note that you can qualify the same attribute more than once, (by clicking again on the qualify box against the attribute) and so you could send a query which would give you results where the value-of-award is greater-than 5000 and less-than 40000.

You can use the > and < signs against date-attributes as well, meaning "after" or "before" the date entered.

- Try qualifying the *Start Date* attribute and entering ....
  Start Date > 01/01/1996
- meaning that the start date of the project is to be after the 1st January 1996.

Removing Qualifications:

Having added a qualification, you may wish to remove one or more of them without starting a new query. You can do this by ....

- Close the results window of your last query. This should return to the 'attribute' window.
- Click on the box **above** the specific qualification you want to remove (see below). To remove the *Start Date* qualification, click on the box above the qualification, as below:

  The box will be highlighted.
- Press the **Delete** key on the keyboard and this qualification will be removed.

4 - Qualifying a Query (cont.)

Qualifying Character Fields:

The example on the preveious page demonstates how numeric and date fields can be qualified. Character fields are qualified differently. If, for example, you want to pick up all the projects where the sponsor code begins with S, then .....

- Start a **New Query**, open the Research Projects table window and select some fields to display. Include *Sponsor Code* and *Project Title* in your selection.
- Click on the **Qualify** box against *Sponsor Code*.
- Type in the character **S**.
- Click on the equal sign (=).
- Select **begins with**. This will select all Sponsor Codes which 'begins with' the letter **S**. If you leave the equal sign (=), BI/query would think you were looking specifically for the character S by itself.
- **Submit Query** and you should get a number of records displayed where the Sponsor Code begins with S.
- Close the results window.

Qualifying with 'Wild-card' Charaters

There are 2 'wild-card' characters that can be used in a search in a search. The first is the % sign which represents any number of characters. The second is the underscore character _ which can represent one, and only one character. For example, if you knew that the fourth character of a word was C then you could submit a query such as.....

Sponsor Code BEGINS WITH _ _ _ C

These signs can be used to either precede or follow the character string. Therefore, the following would find a value which contained the string can.....

Project Title CONTAINS %can%

Try running some queries using these qualifiers and wildcards. One thing to note about character strings is that any queries carried out are case-sensitive. That is, **CAN** is not the same as **can**. All the MIS BI/Query models are case-sensitive and this should be taken into consideration when running queries.

It should also be noted that queries such as Project Title CONTAINS %can% tend to be inefficient as they require to search through the entire table involved, and they may take some time to complete.

4 - Qualifying a Query (cont.)

Building up more Complex Qualifications:

Each of the separate qualifications that you enter will, by default, be joined together by the **and** operator. For example, if you add two qualifications such as Value of Award > 5000 and Value of Award < 40000 you will notice that above the qualifications, and between the two, the word '**and**' will be displayed to give something like.....

o	and	o
|		|
Value of Award > 5000		Value of Award < 40000

This means that both of these conditions must evaluate to "true" before any records are displayed. In fact, the query translates simply to virtually what it says on the screen...

display all records where the value of award is greater than 5000 and is less than 40000.

- Start a New Query.
- Build up the query shown above. To make a multple qualification on a single attribute, simply re-click on the qualify box for the particular attribute.

What happens if we want to see all the projects which have a low award value (say less than 3000) and those with a high value (say, more than 30000), but not the ones in between? You can do this by.....

- Change the first value of 5000 to 3000.
- Change the first operator (the > sign) to a "less than" sign (<).
- Change the second value of 40000 to 10000.
- Change the operator on the second qualification from < to "greater than" (>).

If we leave this the way it is we would have a query which in effect translates to....

display all projects where the value of award is
less than 3000 and is also greater than 10000.

This is obviously not going to return any results at all, as it is impossible for the value to be both less than 3000 and more than 10000. What we want to do is...

display all projects where the value of award is
less than 3000 or is also greater than 10000.

To do this click on the "and" between the two qualifications and it will change to "or" and should look something like.....

o	or	o
|		|

Value of Award < 3000	Value of Award > 10000

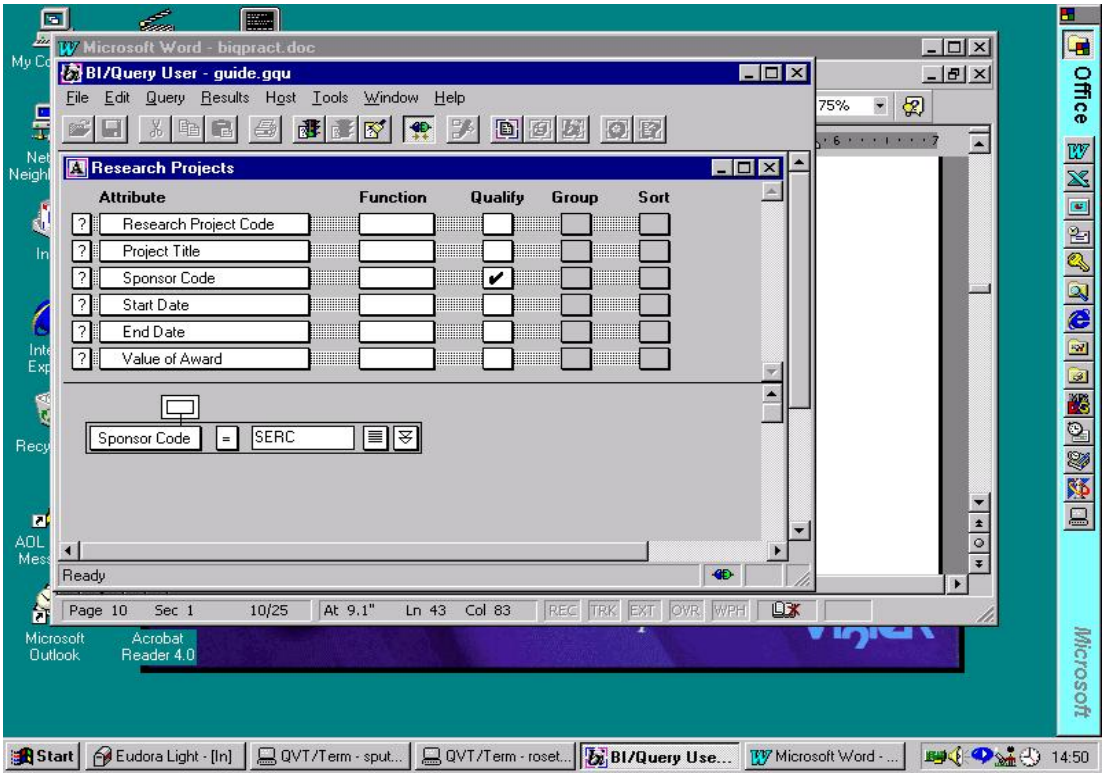
- Clicking on this word will toggle it back and forward between "and" and "or".
- **Submit query**.

- A word of warning - if you have more than two qualifications in your query and you are mixing "and" and "or"s in the query, you must be careful about exactly what the query means, as you will probably end up with an ambiguous query. We will cover this in more detail later in the "More Complex Queries" section.
- Close the results window.

Using a List of Values in a Qualification:

You may wish to say, display all projects from either sponsor code SERC or RSPB. This could be done in more than one way. As we have done above, we could qualify the Sponsor Code attribute twice, enter SERC in one and RSPB in the other, and then change the "and" to "or". However, this becomes cumbersome if the list gets more than a few values. There is another way this can be done.

- Start a **New Query.**
- Open the Research Projects table.
- Select *Research Project Code, Sponsor Code* and *Value of Award* attributes for display.
- Qualify the *Sponsor Code* attribute and enter SERC.
- To the right of the box into which you have just typed SERC is another box with a number of horizontal lines in it. This is the "List-of-values" box. Click on this box.



- A pop-up will be displayed with the options of ....

  New Entry
  Delete Entries
  SERC

- Click on the **New Entry** option. You will be returned to the normal qualification box.
- Place the cursor in the empty box.
- Enter RSPB.
- Click on the List-of-values box again and you will notice at the bottom are the two entries which you have typed in. You could continue adding more items to the list if you wanted using New Entry, but for this example.....
- Click outside the pop-up, and it will disappear leaving the qualification with only the attribute name and the List-of-values box, signifying that there is a list there.
- Finally, click on the equals sign (**=**) and change this to **IN** which is the operator required for a query using a list of values. (Strictly speaking, BI/Query will use IN instead of the = sign, but it is probably better to add it yourself.)
- **Submit Query** and you should get a list of projects codes for these sponsors.
- Close the results window.

The query you have just constructed translates to something like.....

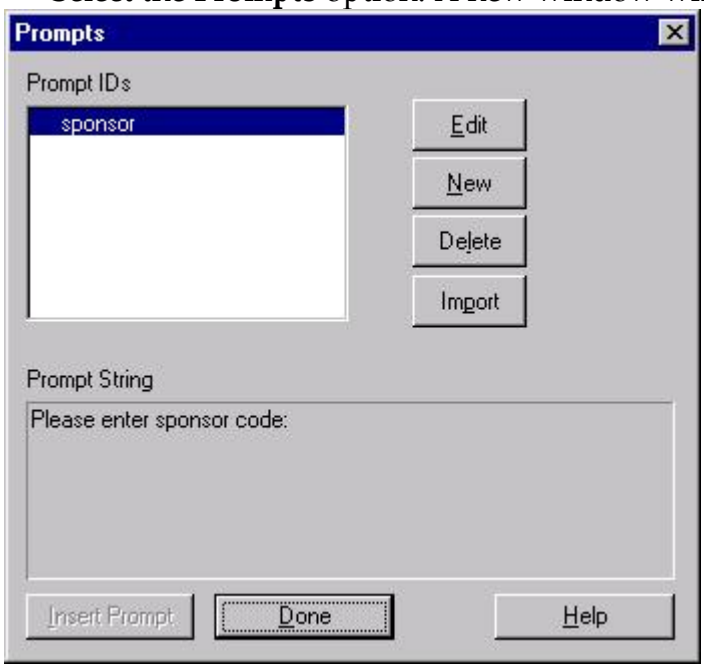
display all projects where the sponsor code is included
in the list "SERC", "RSPB".

5 - Using a Prompt to Qualify a Query

It is likely that you will want to run the same query a number of times, but each time with a different qualification value. This can be done easily by using prompts.

Take, for example, the query which you ran earlier to list all projects where the value of award was greater than 5000. You may want to run this for the condition of greater than 10000, or 400 or any other value. You could change the qualification value in the qualify box if you want, but you can do it in a more flexible way by adding what is called a **Prompt**. Using this you will be prompted for a value when you submit the query.

- Start **a New Query**.
- Double-click on the Research Projects table.
- Select the fields you are interested in displaying - *Research Project Code*, *Project Title* and *Value of Award*.
- Click on the Qualify box against Value of Award. As before, a qualification box will appear at the foot of the window.
- Instead of typing in a value, this time pull down the **Edit** menu at the top of the screen.
- Select the **Prompts** option. A new window will appear.



To create a prompt you have to give the prompt a name and a "prompt string" - this is the wording that will be displayed by the prompt. On the left of the window is a box containing any previously created prompts and on the right are buttons for Edit, New and Delete.

- Press the **New** button.
- Give the prompt a name (in the Prompt ID box) (e.g. min_value)
- **Tab** to the Prompt String box.

- Enter a prompt string (e.g. Enter minimum value.....).
- Click on the **OK** button.

- Click on the **Insert Prompt** button. The prompt name will appear in the qualification box surrounded by << >> (e.g. <<min_value>>) on the model window.
- Remember to change the = sign to > (greater than) sign.
- Try submitting this query. You will now be asked for a minimum value by the prompt and the value you enter will be substituted into the actual query.

Prompts can be used for any number of qualifications in a query.

6 - Looking at the Results in More Detail

Displaying Results in Different Ways

The results of a query are displayed in a "spreadsheet" type format. It may be that you have selected a large number of fields to be displayed, and so some of them will be off the screen to the right. You can scroll across to see these columns, just as you can scroll up and down to look at the records above or below.

However, you can look at the records in a single-entry format (i.e. you can look at the fields for a single row of the results) regardless of how many columns you have.

- To do this, double-click on one of the rows on the slightly grey column to the left of the data (below the number of records displayed). A new window will appear with each of the attributes displayed separately.
- Press the arrows on the "slide" at the top of the window to move between records.
- Close the window to return to the main results window.

Sorting results:

The results that are displayed from a query are not guaranteed to be in any particular order. Normally (but not always) you will find that the projects will be displayed in the *Project Code* order. However, you may want to look at them in *Value of Award* order.

- Display a set of results, and then pull down the **Results** menu.
- Select **Filter** followed by the **Sort** option.
- A window will be displayed with a list of the displayed columns on the left and a box on the right headed **Sort Order.**
- In the left- hand column select the *Value of Award* column.
- Click on the **>> Move >>** button to move this column name across to the other box.
- Click on the **OK** button at the foot of the window.
- Your results will now be sorted on this field and re-displayed.

You can select as many fields as you want to sort on.

In this case the results, which are actually on your PC, were sorted on your local computer. However, if you have a large results set you may find that there is a problem if there is insufficient memory. There is another way you can sort the results. A better, and normally faster, way to sort the results is to define the sort order before you submit the query.

- Close your results windows (you will find there are 2) to return to the Research Projects window.
- The very right hand column in the window is headed **Sort**. Click on the box in the Sort column against the *Value of Award* attribute. A number 1

will appear indicating that this attribute will be the primary sort field when the query is submitted.

- **Submit Query** and you should get the same results as previously.
- Close the results window.

7 - More Complex Queries

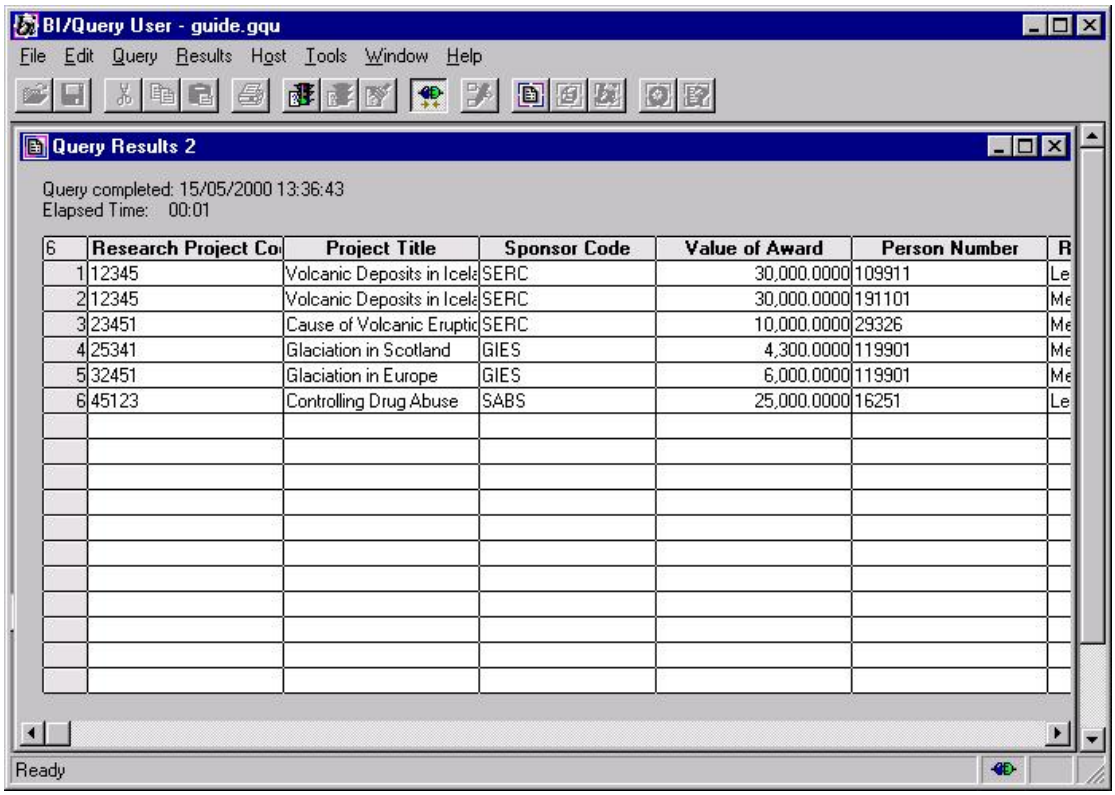
The queries that have been run are fairly basic and only on one table. More than one table can be used within a query to pick up information about related data. For example, within the Research Projects table a *Sponsor Code* is held. This is the code for the organisation which is funding a researh project. The name of the sponsor is actually held in the Sponsors table.

- Start a **New Query**.
- Double-click on the Research Projects table and *select Research Project Code, Project Title*, and *Sponsor Code*.
- Close that window. You will notice that the Research Projects table name is in bold with a bullet against it.
- Double-click on the Sponsors table.
- Select the *Sponsor Name* attribute.
- Submit Query.

This time you are running a query which is retrieving information from two tables. BI/Query uses the relationship (the common fields/columns held on each table) to pick up the *sponsor name* which is related to the sponsor code held in the project table.

The relationships can be thought of as pipes through which the information, of which the relationship is composed, is passed from one table to another. In this case a list of projects (based on any qualifications which you may impose) will be retrieved from the Research Projects table. The *sponsor code* from each can then be thought of as being passed along the relationship to the Sponsors table where the *sponsor name* for each of these sponsor codes will be retrieved. The resulting information will then be displayed.

- Close the results window.
- Start a **New Query**.
- Double-click on the Research Project table and select some fields. Close the window.
- This time double-click on the Investigators table.
- Select *Person Number* and *Role Within Project*.
- **Submit Query**.
- The results will be displayed. However, only 6 rows are shown. Remember, there were 9 projects in total. And if you look at the project numbers more closely, you will see that there are, in fact, only a total of 5 different projects represented in this listing.



6	Research Project Co	Project Title	Sponsor Code	Value of Award	Person Number	R
1	12345	Volcanic Deposits in Icela	SERC	30,000.0000	109911	Le
2	12345	Volcanic Deposits in Icela	SERC	30,000.0000	191101	Me
3	23451	Cause of Volcanic Eruptic	SERC	10,000.0000	29326	Me
4	25341	Glaciation in Scotland	GIES	4,300.0000	119901	Me
5	32451	Glaciation in Europe	GIES	6,000.0000	119901	Me
6	45123	Controlling Drug Abuse	SABS	25,000.0000	16251	Le

The reason for this is as follows. The query which you have just submitted effectively translates to....

> Display all the projects in the system, together with all the investigators involved with each of them.

Project 12345 has 2 investigators and the other projects displayed have only 1 investigator. The other projects **do not have any investigators at all** (or at least none recorded in the database), hence even the basic details about the project (project code and title for example) are not displayed.

- Close the results window

7 - More Complex Queries (continued)

Combining Qualifications with ANDs and ORs

- Start a **New Query.**

In the "Qualifying a Query" section earlier we saw how to combine more than one qualification and how to change the "and" to an "or" where necessary. However, care must be taken if you are combining qualifications with both "and" and "or" in the same query. For example, build up a query which looks like....

```
    o          or              o          and          o
    |                          |                       |
Sponsor Code = SERC     Sponsor Code = RSPB      Value of Award >
10000
```

What you are actually wanting to do is define a query which says...

display all projects where the sponsor code is either SERC or RSPB,
and the value is greater than 10000.

Unfortunately, this query is ambiguous. It could be translated to mean....

display all projects where the sponsor is SERC (irrespective of the value),
or all the projects which are valued above 10000 with sponsor code RSPB.

Unless you clarify the situation, you may get back results which you did not expect. We need to group together the first two qualifications (something like bracketing them together in a mathematical equation) to ensure the result of that whole part evaluates to "true".

- Create a query and qualify as in the example above.
- Click on the box above the first *Sponsor Code* qualification.
- Press down the SHIFT key on the keyboard, and click on the box above the second Sponsor Code qualification (both of these boxes should now be highlighted).
- Select the **Query** menu option from the top of the screen.
- Select **Qualification** from the drop-down menu and then click on the **Combine** option.

The display should now look something like the following and this does produce the first version of the query defined above unambiguously....

```
                  n              and              o
                  |                               |
                  |                    Value of Award > 10000
        o         or        o
        |                   |
   Sponsor Code = SERC   Sponsor Code = RSPB
```

You can Uncombine these qualifications again by ....

- Clicking on the box above the combined set.
- Pull down the **Query** menu.

- Select **Qualification.**
- Select **Uncombine.**

8 - Using a Function

In this database we have a list of projects with basic details about them, including the sponsoring body, and the value of each award. It may be useful to ask a question such as....

List the total amount received from each sponsor.

This can be done using **Functions.**

- Start a **New Query**
- Double-click on Research Projects
- Select *Sponsor Code*.
- Select *Value of Award.* Only 2 attributes should be selected.
- There is a column headed **Function**. Click on the function box against *the Value of Award attribute*. A list of functions will be displayed. These are the functions which can be carried out on this field.
- Select **SUM**, and SUM will be displayed in the box.
- **Submit Query**.

- The results displayed will show the sponsor code and a value which should represent the **total** for that sponsor. Notice that there are only 5 records displayed. If you noticed when running a simple query against Research Projects, there were a few projects being funded by the same sponsor. These have been lumped together to produce one value for that sponsor.

- Close the results window.

- To prove this, start a new query, and from Research Projects, select *Sponsor Code* and *Value of Award* without the SUM function (or simply select **NONE** as a function in the same query). Check the values against the last query and prove to yourself that they are correct.

A function such as SUM **will only be calculated for each distinct set of data which is being displayed.** This means that if another attribute was chosen to be displayed (e.g. Research Project Code as well as Sponsor Code and Value of Award), the summing would be done by project code and sponsor code, resulting in 9 separate values, and not giving you what you set out to get.

- Try this.

You will also notice that BI/Query automatically adds a number in the Group column of the displayed columns (except the one which is being summed). This indicates that these attribute(s) will be "grouped together" into distinct groups before the summing is done. The sum will then be displayed for each grouping.

9 - Looking at Reports

So far we have run queries and looked at the Results in a spreadsheet style format. You can convert these results into what is called a Report, which allows you to carry out some further manipulation of the data, and also to print the results.

- Start a **New Query**
- Open the Research Projects table and select *the Research Project Code, Sponsor Code* and *Value of Award* fields (in that order).
- Select Sponsor Code as the primary sort attribute.
- **Submit Query**.
- Select the **Results** drop-down menu.
- Select **Show as Report**.
- Select **BI/Query Standard**
- A new window will be displayed headed Report - Query Results n.

This window shows the results in a "what-you-see-is-what-you-get" (WYSIWYG) type format. Each screen is divided into a number of components which include

1 the heading for the report,
2 the headings for each column, and
3 the results columns themselves.

Each component can be selected by clicking, or double-clicking on it to edit the component.

- Double-click on the report heading (Query Results N).
- From here you can edit the text - press the **Edit Text** button.
- You can then change the font, size, alignment and the actual text of the heading etc.
- Try making some changes to the heading.
- You can do a similar thing to the column headings.
- Now double-click on the *Research Project Code* results column.
- Press the **Text Style** button.
- Again, you can modify the font, size etc. for this column.
- Return to the main Report window.

You can make many changes to the way the report looks.

- Pull down the **Report** menu.
- Select the **Column Settings** option. Here you can change the column widths, specify that specific columns should be wrapped (i.e. split over more than one line) or that you want all columns to fit onto a page etc.
- Try changing some of the settings and see the results you get.

9 - **Looking at Reports (continued)** - *Adding Grand Totals and Sub-Totals*

You can add totals to the displayed columns.....

- Pull down the **Report** menu again.
- This time select the **Add Grand Total** option.
- A new component will be added to the window at the foot of each of the columns. By default this will all be set to COUNT for non-numeric attributes and SUM for numeric ones.
- Click on the cursor on this component at the foot of the *Research Project Code* column. A pop-up will be displayed of the options available.
- Select **NONE.**
- Do the same for the *Sponsor Code* column.
- On the third column (which should be *Value of Award*) the default of SUM should be what you want - leave this as it is.
- Click outside the grand-total component and the new values should be displayed giving a grand total for the Value of Award column.

You can also add sub-totals to the report.....

- Close the Report, Results and Research Projects windows and start a **New Query**.
- Select *Sponsor Code* and *Value of Award* (in that order) from the Research Projects table as fields to display, and sort on *Sponsor Code*.
- **Submit Query**.
- Show the results as a report.
- Now we want to add sub-totals by Sponsor.
- Select the *Sponsor Code* results column.
- Pull down the **Report** menu.
- Select the **Add Subtotal** option.
- A new component will be added under each grouping of sponsor codes with **SUM** set as the default function in the *Value of Award* column.
- Simply click anywhere outwith this new component and the sub-totals will be displayed.

You can also add a calculated column to the report.

- Pull down the **Report** menu.
- Select the **Add Calculated Column** option and a window (Add Calculated Column) will appear.
- Enter a name for the column in the box at the top (e.g. Value + 50%)
- In the lower left of the window is a box with a list of attributes. Click on *the Value of Award* one.
- Press the **Insert Column** button and this attribute name will be displayed in the Expression box at the centre of the window.
- Now use the numeric keypad to the right of the window and click on the multiplication sign (*) followed by 1.5.
- Click on the **OK** button and you will be returned to the report window which now has a new column added to it.

There are a number of other things which you can do within the Results section. These include re-ordering the columns, suppressing duplicates within a column (i.e. so that only the first instance of a value is printed), and you can add various borders to the report. Try some of these out now.

10 - Saving Queries and Creating Buttons

Saving Queries:

BI/Query is very useful for ad-hoc queries. However, there are likely to be many queries which you may want to run again and again. To allow this, you can save a query so that it can be loaded again and run at, perhaps, another session.

- Return to the main model window closing all the necessary windows.
- Start a **New Query**.
- Select the Research Projects table, and click on the attributes *Research Project Code, Project Title, Start Date, End Date and Value of Award*. Close the window.
- Select the Sponsors table and click on the *Sponsor Name* attribute. Close the window.
- Open the Investigators table and click on *Role Within Project*. Close the window.
- Open the Persons table and click on the *Title, Forename and Surname attributes*. Close the window.
- Finally, open the Organisational Units table and click on the *Organisational Unit Name* attribute. Close the window.
- **Submit Query**.

This is a reasonably complex query, and would normally include some qualifications (perhaps using prompts as well) - add some qualifications if you want.

In order to save this query so that you can run it again.....

- Select the **Query** drop-down menu.
- Select the **Save...** option. A new window will be displayed and the cursor will be in the Query Filename box.
- Type in a new name for this query.
- Press the **Save** button. The query will be saved in a file on your PC.
- Now close the results window, and start a **New Query** (this is just to clear the current query).
- Pull down the **Query** menu again, and select the **Load...** option.
- Click on the name of the query you have just saved.
- Click on the **Submit** button. Your query will start to run.

10 - Saving Queries and Creating Buttons (continued)

Creating Buttons:

To make things simpler, you can create a windows-style button on your BI/Query model to let you run the query.

- Close any open windows to return to the main model window.
- Click on the **'Pencil'** icon(11th from the left) to select **Design mode**. A small 'Layout' box will be displayed plus icons on the left-hand side of the screen.
- Select the second icon down in the shape of a box.
- Holding your finger on the left-hand button on the mouse, move the cursor to the model screen and draw a box with the **+** cursor on the model.
- Double-click on the new box. An 'Edit Button' window will be displayed.
- The displayed window has 3 main sections headed *Appearance, Linkage* and *Output*. The first defines what type of button - this can be a "normal" text button, an icon or even a picture. For this exercise simply leave it as a text button, but use the **Edit Text** button to change what it will display.
- The *Linkage* part of the window allows you to define what this button will be linked to. For our purposes, we want to link the button to a specific query. At the right hand side use the arrow on the right-hand side of <current query> to select the query you have just saved (it should be at the top of the list).
- Now press the **OK** button at the bottom of the screen. You will be returned to the main model window. The box will still be highlighted. This indicates that you are in 'Design mode'.
- Click in the '**Pencil**' icon to deselect 'Design mode'. This returns you to normal mode.
- Select **Query** and **New Query** or click on the '**Paintbrush**' icon to clear the currently loaded query.
- Click on the new button. This should load the query to which it has been linked, run the query and display the results.

Finally, a button can be linked to a query as we have seen, but the results, by default, are displayed on the screen. These results can be diverted to another output rather than the screen, such as another application like Excel.

- Close the results window again.
- Select 'Design mode' again using the '**Pencil**' icon.
- Double-click on the new button. This will edit the button.
- Leave the *Appearance* and *Linkage* parts, but look at the lowest part of the window headed *Output*. The default output is to a Window, which will currently be selected. Change this by clicking on the name *Application*.
- Click on the **Export Options** button and the 'Export Options' window will be displayed.

- Under **Export To**... use the drop-down arrow on the right-hand side to select **Microsoft Excel**.
- Click on the **OK** button, and again on the **Edit Button** window, returning you to the model (but still in edit mode).
- Click on the '**Pencil**' icon to deselect the design mode.
- Now click on the button again.
- This time the results are not displayed to the screen, but are put into the clipboard. Excel is automatically started up, and the results are then loaded into the spreadsheet from the clipboard. (This assumes that you have Excel on your machine, and that it is on the path!)

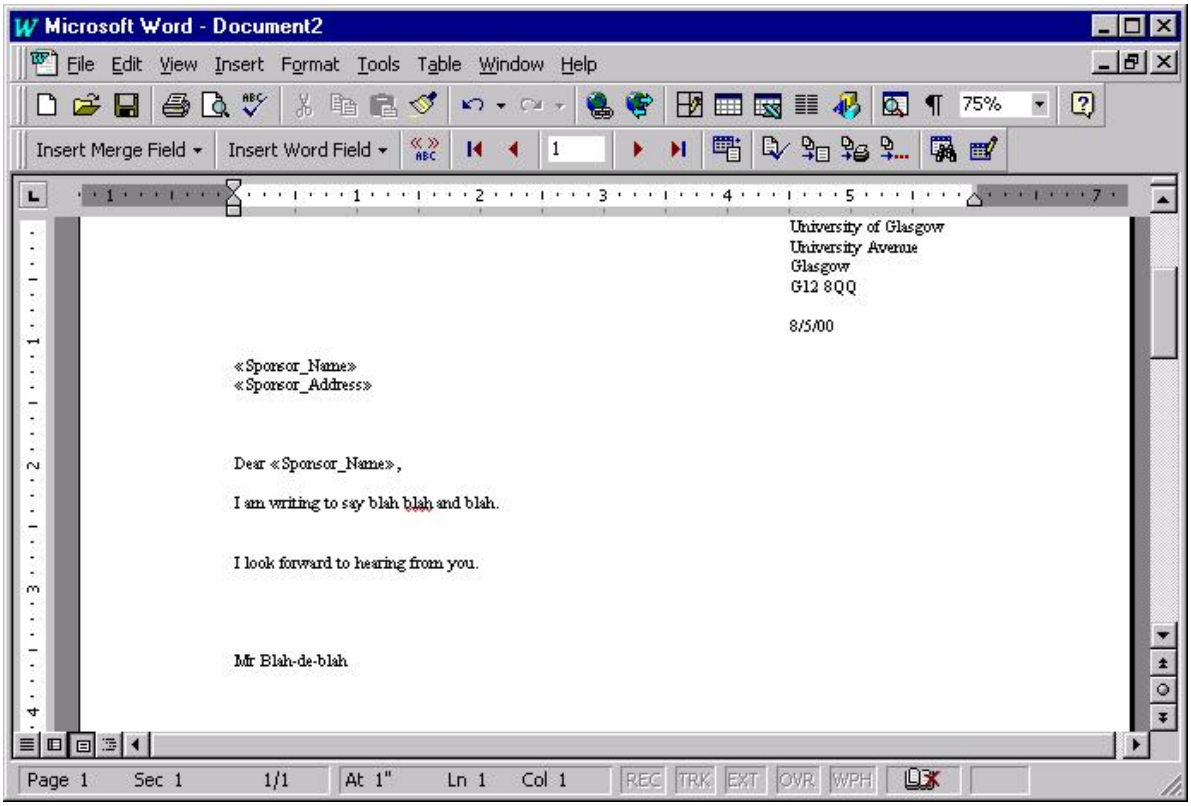
8.0 Mail Merging GQL Results Files

You may find you regularly download data into Word or Excel. If this is the case, you may find it useful to use the 'Mail Merge' function available in both Word and Excel. This function allows you to 'insert' the data you have downloaded, into a Word or Excel document in a format/layout already specified by you.

In this example we will retrieve all sponsor names and addresses, and then produce a standard letter to each of them (an example letter which you should follow is shown overleaf).

- Select *Name* and *Address* from the Sponsors table.
- Submit the query.
- From the **Results** menu select **Options**.
- Click on the '**Save column headings**' option so a tick is placed in the box to the left of this text. Now click on the **OK** button.
- From the **Results** menu select **Save As...** then selct the option **Results....** A '**Save Query Result to File**' screen will be displayed.
- Enter '**sponsor.qrd**' in the **File Name**: box and ensure that you are saving the file to the c: drive.
- Click on the **Sav**e button. You will then return to the Results Window.
- Now open up a new document in **Microsoft Word**.
- From the **Tools** menu select **Mail Merge**.
- Click on the **CREATE** button and select '**Form Letters**'. A message will appear, click on the **ACTIVE WINDOW** button.
- Next click on the **GET DATA** button and select **OPEN DATA SOURCE**. An **'Open Data Source'** window will be displayed. On the bottom left-hand side of this window, click on the arrow on the right-hand side of the **'Files of type' box**, scroll down and select **All Files (*.*).**
- Now locate the directory/folder in which you saved the file **sponsors.qrd**. Open this file by highlighting the filename and click on the **OPEN** button.
- A message will appear, click on the **EDIT MAIN DOCUMENT** button.
- Now click on the **INSERT MERGE FIELD** button (above the margin line at the top left of the document) and select both *sponsor name* and *sponsor address* fields (when selected the field name will appear in the actual document with << signs on either side).
- Move these fields so that the name and address are located in the top left hand side of the document and type the University address in the top right hand corner.
- Now start the main body of the letter by typing '**Dear...** ', then click on **INSERT MERGE FIELD** and select sponsor name. (P.T.O for screen example)
- Finish off your letter by typing whatever you think may be appropriate.
- If you select **Mail Merge** from the **Tools** menu and click on the **MERGE** button and then **MERGE** again, you will be able to view the letters for

each sponsor on the screen. If you were to click on the 4th icon from the right (**Merge to printer**) all the letters would be printed (**don't do this!**).



11 - Finishing Off

We have only looked at a fairly small part of what BI/Query is capable of. The BI/Query User Guide should give you a reference guide for a more detailed look at some of the other features BI/Query has.

- In the mean time, please close any windows which you have open to return you to the main model window.
- Use the description from section 2 of these notes to disconnect from the central computer.
- Use File/ Exit to stop BI/Query running. You will be prompted and asked if you want to save the changes which you have made to the model. **Reply NO to this prompt.**

Notes on Running Queries

- Queries should be planned carefully to ensure the data you are getting back is in fact what you wanted.

- Do not select attributes from all tables on the model - this query will take an extremely long time to run and will slow down the database for other users.

- In some cases it may be easier to do two separate queries and JOIN the results.

- Be careful when qualifying a query using a number of AND and OR conditions as you may misinterpret what your query is doing and indeed the query itself may have become nonsensical!

- If a query has been running for some time (particularly if you thought the query was simple) it may be best to 'Cancel' the query, redefine it and try running it again. Complex queries and queries which make no sense run for a long time so check you haven't made your simple query into one of these!

The Demonstration Model (guide)

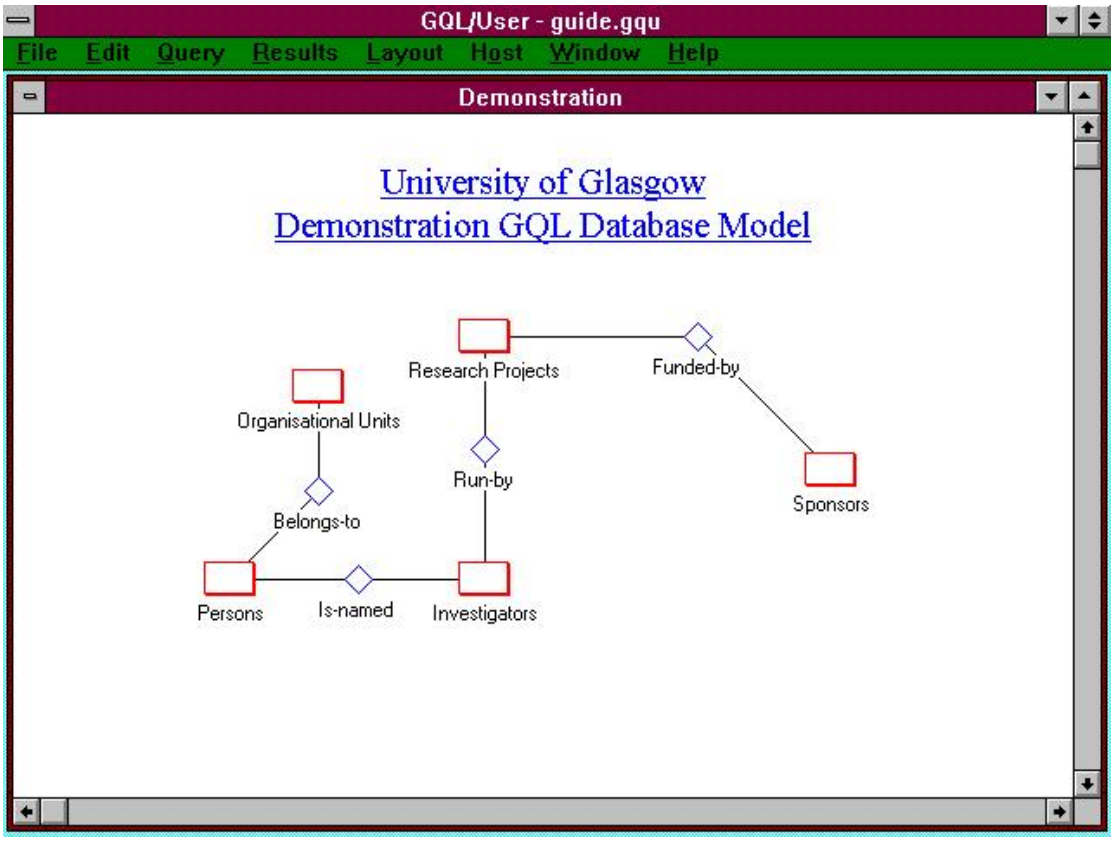
The following pages show the model which is used for the course and the attributes in each of the tables. The relationships are defined below.

Note that by clicking on the ? to the left of each of the attribute names some details about the attribute can be displayed. The most useful of these is probably the Data Type which indicates what type of data can be held. For example c(20) would indicate it to be a character field holding up to 20 characters.

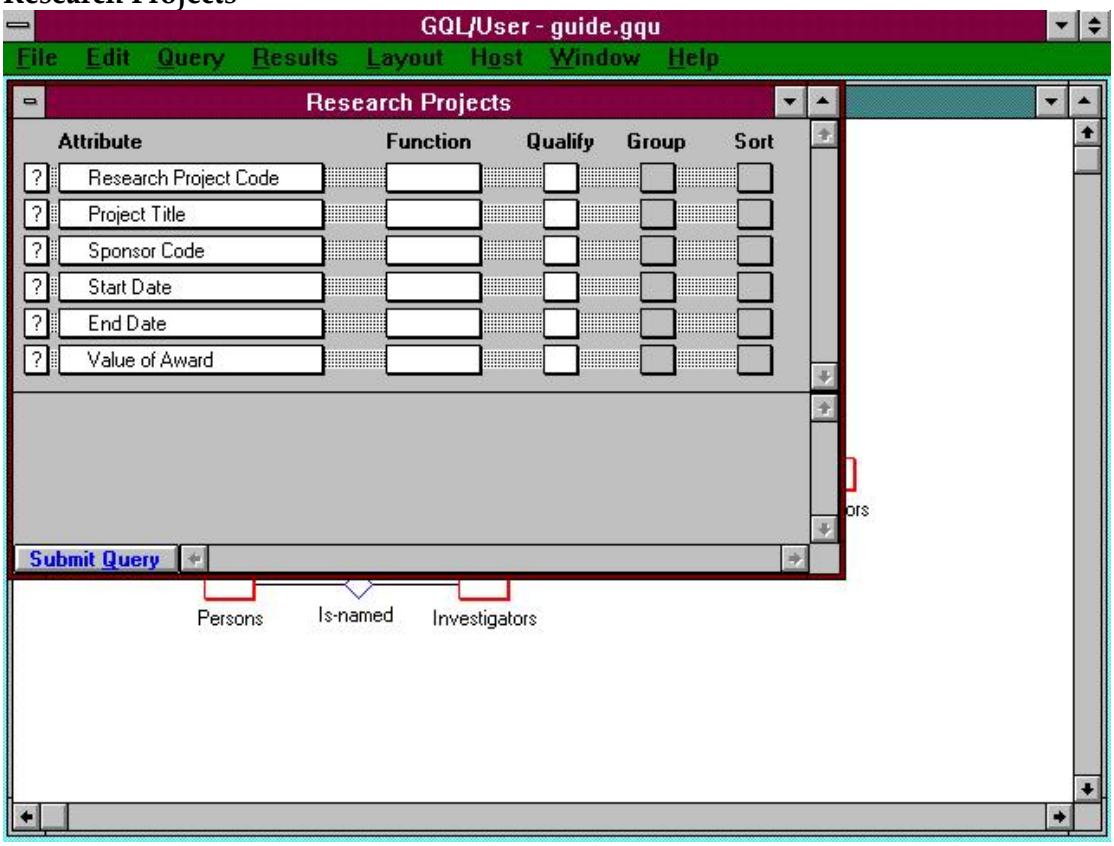
Relationships:
The relationships on the Demonstration model are composed of the following attributes within the tables ...

Relationship Name:	Attributes Composing the Relationship:
Funded-by	Sponsor Code
Run-by	Research Project Code
Is-named	Person Number
Belongs-to	Organisational Unit Code

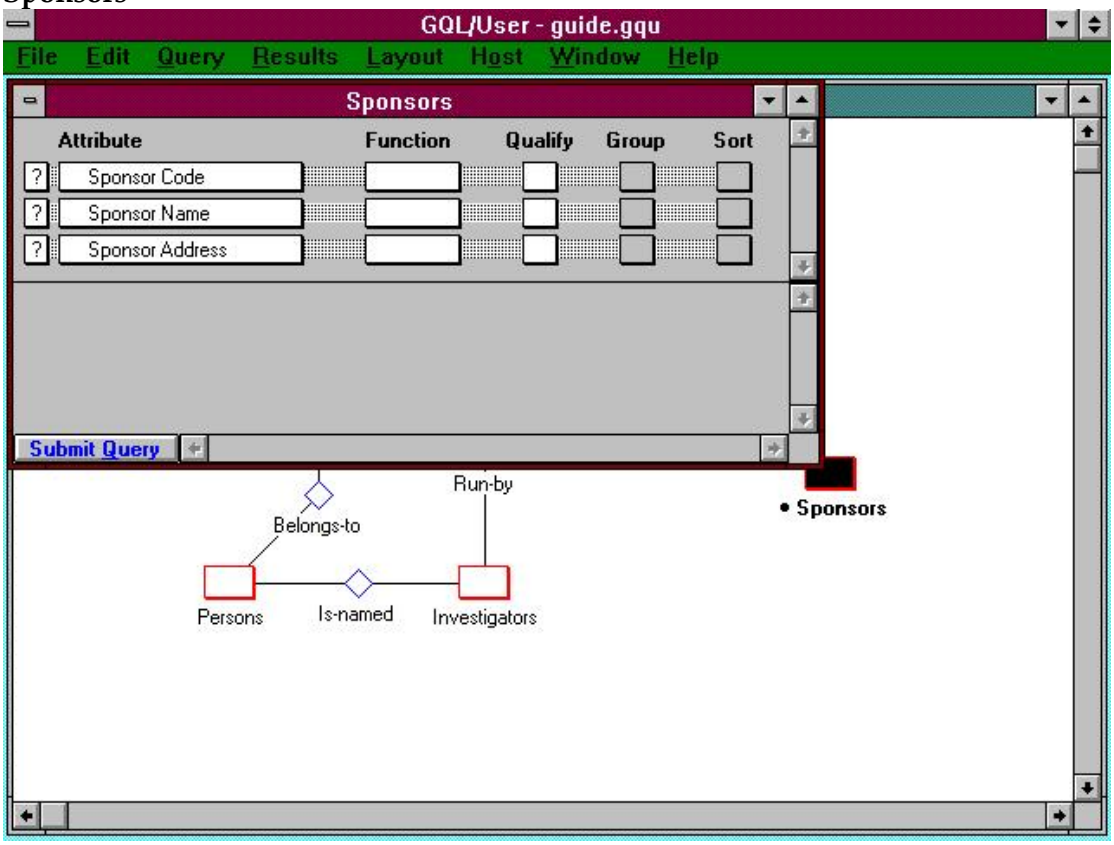
The Demonstration BI/Query Model



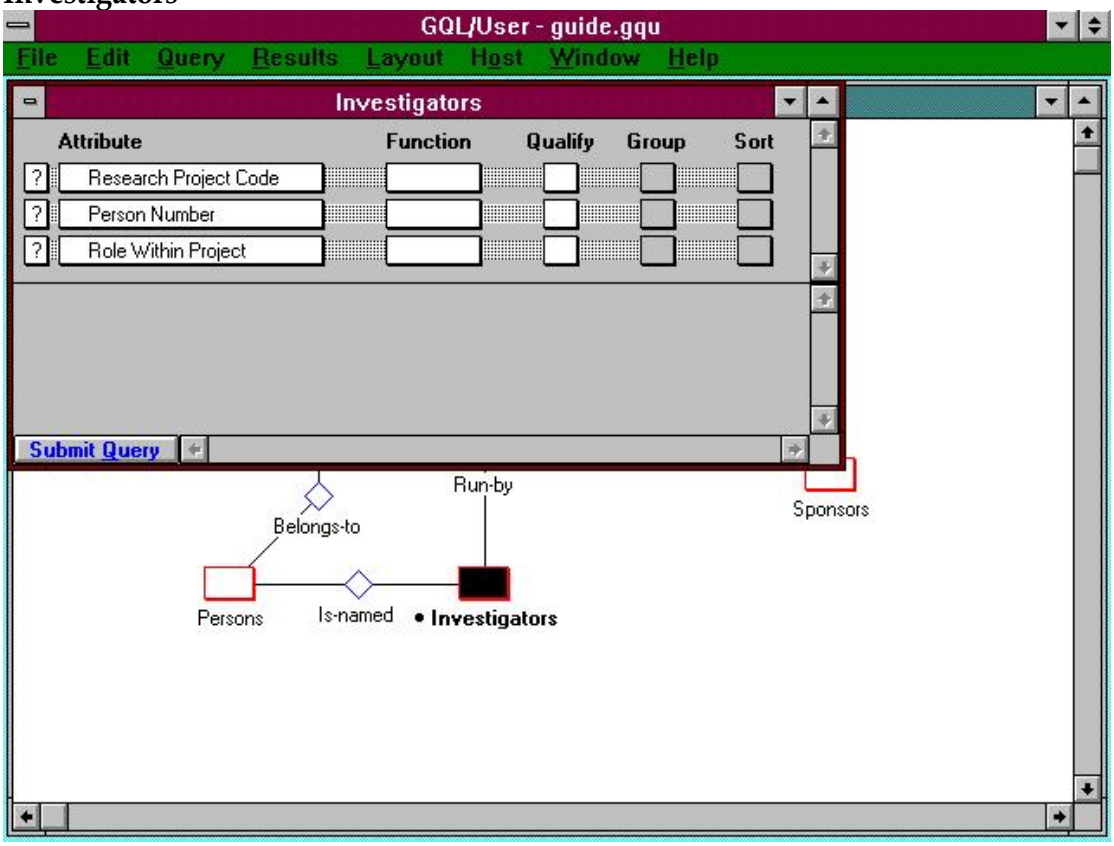
Research Projects



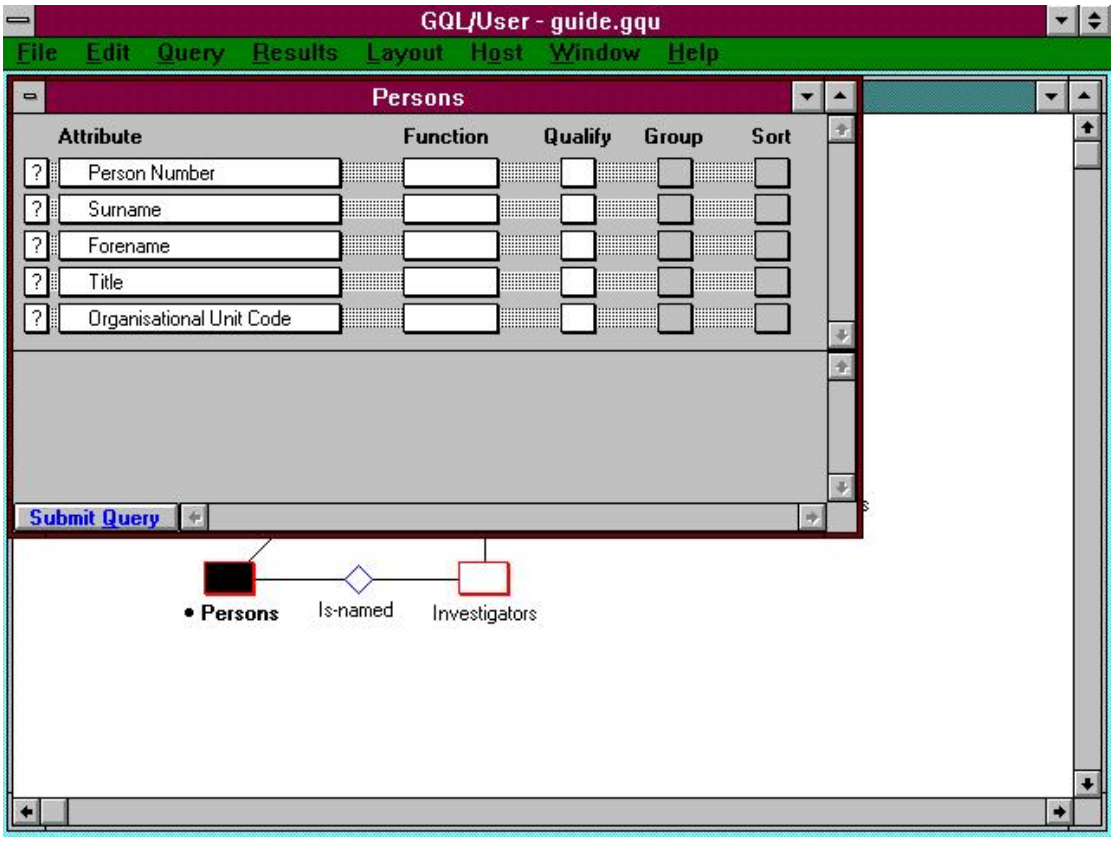
Sponsors



Investigators



Persons



Organisational Units