02b-Database Queries

2.3 Query design

Queries represent a very powerful method of allowing users to see different views of the information in a database. Once a query has been created, it acts as if it is a real table – however, the underlying information is not duplicated. Queries can be created based on a number of tables that are linked together. The default type of query is the **select query**.

Creating a query

How to... create a query

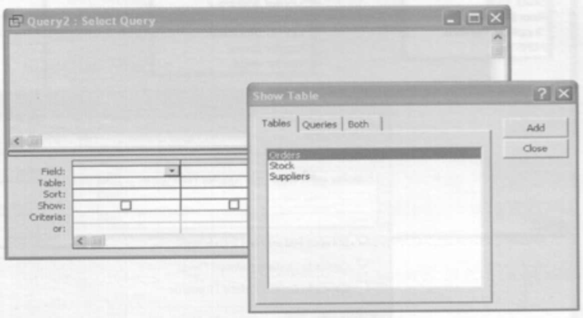


Figure 18.7: Select queries

1 Open a database and select Design Query. The dialogue box shown in Figure 18.7 appears.

2 In the Show Table dialogue box, choose the tables that you wish to work with. Note that it is possible to select existing queries as well as tables.

3 The selected tables from your database will be displayed at the top of the screen (see Figure 18.8) – note that the one-to-many relationship between the tables is displayed visually as 1-∞.

4 The query is created in the lower part of this screen. Drag field names down as needed. Make sure that the Show box is checked for all the fields you wish to display when you run your query.

The query shown in Figure 18.9 will select and display the three fields indicated of all records in the Stock table, as well as the Supplier name field of all records in the Supplier table.

This shows the relationship between the tables.

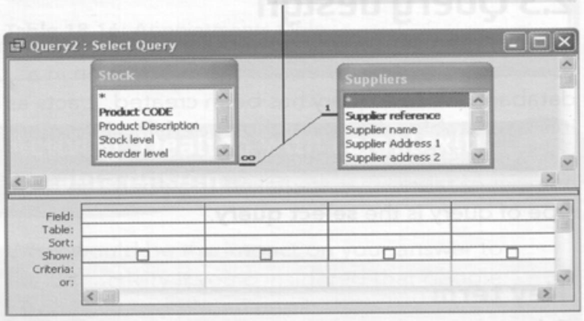
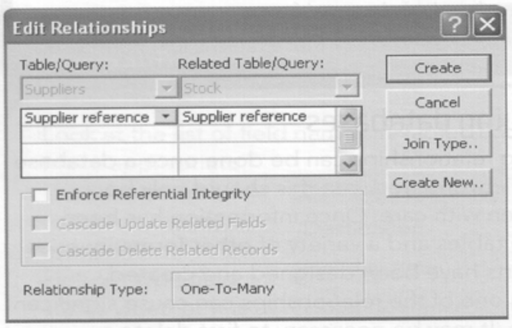


Figure 18.8: Adding the tables to be used in the query



Table/Query: Suppliers

Related Table/Query: Stock

Supplier reference — Supplier reference

☐ Enforce Referential Integrity

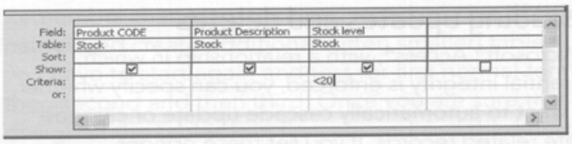
☐ Cascade Update Related Fields

☐ Cascade Delete Related Records

Relationship Type: One-To-Many

Figure 18.9: A simple select query

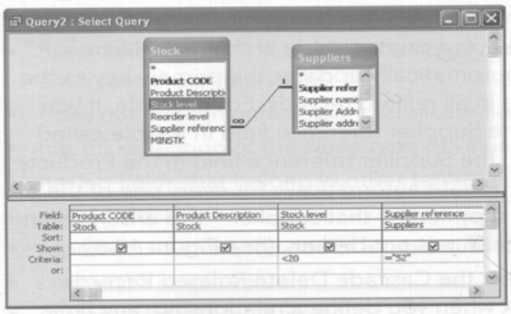
5 You can also set criteria for your query. For example, the query shown in Figure 18.10 (bottom half of screen only in the screenshot) will select the three fields indicated from the Stock record, but only for those records which have a Stock level less than 20.



Field:	Product CODE	Product Description	Stock level	
Table:	Stock	Stock	Stock	
Sort:				
Show:	☑	☑	☑	☐
Criteria:			<20	
or:				

Figure 18.10: A select query with one criterion set

6 You can set multiple criteria for your query. For example, the query shown in Figure 18.11 will select the fields indicated, but only for those records which have a Stock level less than 20 and that are supplied by supplier S2.



Field:	Product CODE	Product Description	Stock level	Supplier reference
Table:	Stock	Stock	Stock	Suppliers
Sort:				
Show:	☑	☑	☑	☑
Criteria:			<20	="S2"
or:				

Figure 18.11: A select query with multiple criteria

7 Click on the Run button on the toolbar (with the red exclamation mark) to run the query and check that it selects the correct fields.

Activity: Designing queries

1 Design a query to show all details of the products in the Stock table except for the Supplier reference.

2 Design a query to show the Product Description and Product Code of all products supplied by suppliers based in Bristol.

Use of logical operators

The method used by Microsoft® Access® to create queries is called Query by Example. In this method, an example is given of what the output will be (eg the query shown in Figure 18.11 specifies that the Supplier reference must be "S2" and the Stock level must be less than 20). The system uses the normal set of operators as given below.

Operator	Meaning
=	Equal to
Not	Not equal to
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
Like	Matches a prescribed character pattern. The * symbol is used as a wildcard.

Table 18.18: Operators that can be used in query criteria

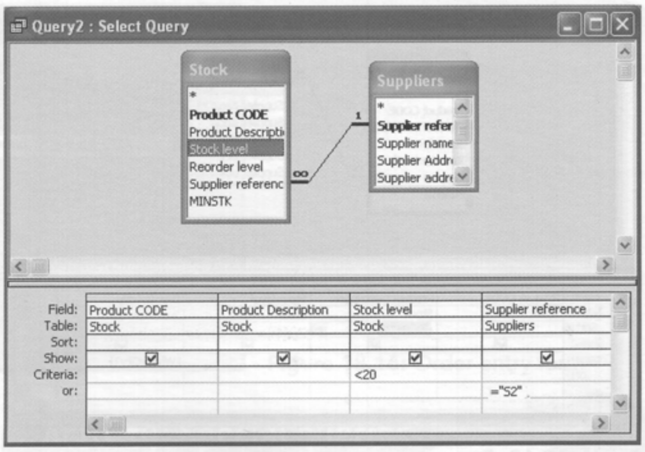
In other systems, other logical operators such as AND and OR are also employed to develop complex queries. However, in Query by Example systems AND and OR are implemented through the design of the query itself – there is no need for the user to enter them.

For example, the query shown in Figure 18.11 has both the criteria on the same line. So, the query means:

(Stock level <20) AND (Supplier reference ="S2")

If the criteria are on separate lines as seen on Figure 18.12 the meaning will be:

(Stock level <20) OR (Supplier reference ="S2")



Field:	Product CODE	Product Description	Stock level	Supplier reference
Table:	Stock	Stock	Stock	Suppliers
Sort:				
Show:	☑	☑	☑	☑
Criteria:			<20	
or:				="S2"

Figure 18.12: Query showing Stock level <20 OR Supplier reference = "S2"

Activity: Basic queries

1 What is a select query?

2 Give five examples of operators that can be used in query design.

Special queries

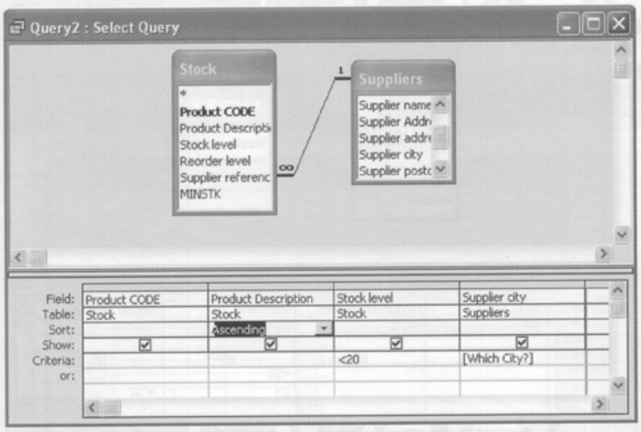
Parameter queries

A query could be written to select the names of suppliers based in London only. To select a series of different towns then a number of queries – one for each possible town – would need to be created. This is time consuming and tedious to do.

A **parameter query** overcomes this problem and allows the user to choose the town as the query is run – this makes it a lot more flexible. The query is set up in the same way but instead of putting a specific town into the Criteria row a question is used as shown in Figure 18.13.

Key term

Parameter query – a query that prompts the user of a database to set specific criteria for the fields selected for that query by the database designer.



Field:	Product CODE	Product Description	Stock level	Supplier city
Table:	Stock	Stock	Stock	Suppliers
Sort:		Ascending		
Show:	☑	☑	☑	☑
Criteria:			<20	[Which City?]
or:				

Figure 18.13: Parameter query

When the query is opened or run, the question given in square brackets is displayed and the user types in whatever town is required. The user enters the required town and the query runs accordingly. This is a much more flexible way of managing queries.

When the query is run, the dialogue box shown in Figure 18.14 opens. Once the city is entered, the query runs as before.

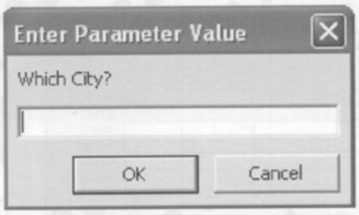
Delete queries

The default type of query already described is a Select Query. Another type of query that can prove useful is the Delete Query – as shown in Figure 18.15. The query is built in the usual way but the type of query is changed to Delete using the options in the Query pull down menu.

The query shown in Figure 18.15 will, when run by clicking in the Run button (red ! in the toolbar), delete all records where the Product CODE starts with the letters "FD".

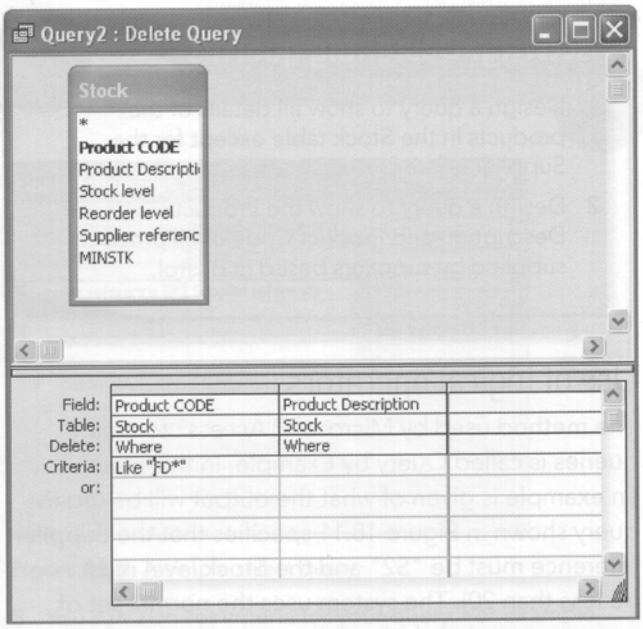
Other special queries

Other special queries such as Update or Append can be selected in the same way as the Delete Query.



Which City?

Figure18.14: Dialogue box for parameter query



Field:	Product CODE	Product Description	
Table:	Stock	Stock	
Delete:	Where	Where	
Criteria:	Like "FD*"		
or:			

Figure 18.15: Delete Query

Activity: Special queries

Find out how the other types of queries operate and experiment with them to be sure you understand how they operate. **Tip:** experiment on a backup copy of your database.