### Activity 18.9

**Producing calculations at run time**

In this activity you will learn how to:

- create calculated fields
- perform calculations at run time
- format fields.

One way of performing a calculation on data in a database is to create a calculated field which is worked out in a calculation performed on other fields already in the database. This is called a calculation produced at run time.

1. Load Microsoft Access and open the file **Personnel_database**.
2. The company has decided to give all the employees a 5% pay rise. You have been asked to produce a query that shows the fields Employee no, Surname, Description, and Salary along with two new calculated fields.
   
   One of these calculated fields is to be called Pay rise and the other is to be called New salary.

   Create a query by clicking on **Create** and then on **Create Wizard**.

   Select Simple Query Wizard and click OK.

   Add the fields asked for to the Selected Fields box and then click Next. (Note you will need to use the fields from both tables.)

   At the next window click on Next.

   You now change the name of the query to that shown below and also select Modify the query design when your query will look like this:

   ![Simple Query Wizard](image)

3. Click on Finish and the query design will be shown:

   ![Query Design](image)

   In the first row of the first blank column enter the following formula:

   Pay rise: \([\text{Salary}] \times 5/100\)
There are some important points to remember with formulae:

- The new fieldname is written to the left of the colon (:).
- Fieldnames that are used in the formula have to be exactly the same as those used in the database.
- The fieldnames used in formulae must be enclosed in square brackets.

Adjust the width of the column so that all of this formula can be seen like this:

<table>
<thead>
<tr>
<th>Field/Fieldname</th>
<th>Employee No</th>
<th>Surname</th>
<th>Employees</th>
<th>Description</th>
<th>Departments</th>
<th>Salary</th>
<th>Employees</th>
<th>Pay rise</th>
<th>[Salary] * 5 / 100</th>
<th>New salary</th>
</tr>
</thead>
</table>

In the next blank column enter the following formula to calculate the New salary:

New salary: [Salary] + [Pay rise]  

Widen the column containing this formula so that all of it is shown like this:

4 Click on Home and then View to see the results of the query.

Notice that the Pay rise field is not formatted correctly.

Go back to the Design View and right-click the mouse button on the field as shown here:

Pay rise: [Salary] * 5 / 100

The following menu appears from which you should select Properties.

The Property Sheet appears on the right like this:

Click on Format and click on the drop-down arrow and select Euro from the list.

Click on Decimal Places and click on the drop-down arrow and select 0 from the list.

You have now formatted this field.

Just because you see numbers inserted in the correct place do not assume they are correct. It is easy to make mistakes with formulae. Check the calculations manually with a calculator to ensure the output is correct.

The New salary field also needs formatting so that the currency Euro is shown and the data is shown to 0 decimal places. Make these changes in a similar way to the above.

5 Click on Home and then View to see the results of the query and check that they are correct.

Save and close the query.