National 5

Computing Science

Structures and Links: Databases
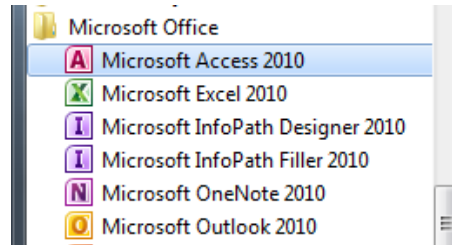
Practical Notes

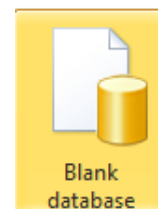# Contents

Starting a New Database

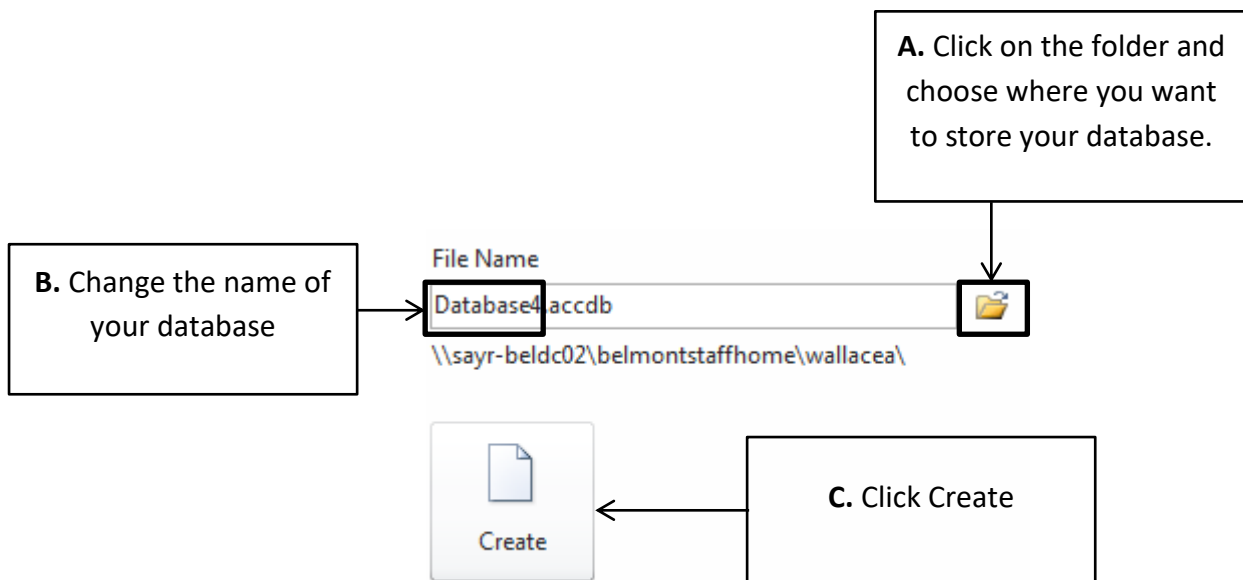1. From the **Start** menu, open the **Microsoft Office** folder.

2. Choose **Microsoft Access 2010**

3. Make sure **Blank Database** is highlighted

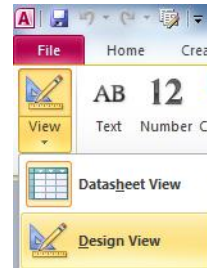4. On the right hand side of the screen:

A. Click on the folder and choose where you want to store your database.

B. Change the name of your database

File Name

Database4.accdb

\\sayr-beldc02\belmontstaffhome\wallacea\
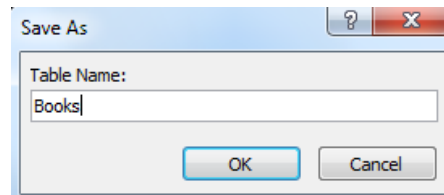
Create

C. Click Create

Designing a New Database

1. Click on the **View** option and select **Design View**

2. Give your new database table a *sensible name* then click **OK**.
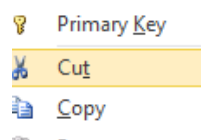

3. Enter your field names and data types.
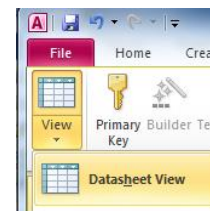
| Type in your field names in the **Field Name** column. | Choose the correct data type from the **Data Type** column. |

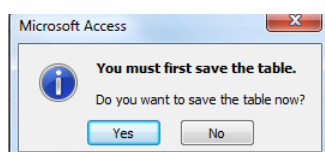*Fields can be removed by right clicking here and selecting Cut.*

4. When all fields have been added, click on the **View** option and select **Datasheet View.**

5. Click **Yes** to save your table.

Adding Records (Datasheet View)

In **datasheet view**, records can be added by simply typing the new details into the first available row (beside the *).

| Title	Quantity	Published	Author
The Great Gatsby	53	10/04/1925	F. Scott Fitzgerald
Great Expectations	28	02/02/1861	Charles Dickens
*			

After you have finished entering a piece of information, it is **automatically saved** when you **exit the field**.

Adding Records (Pasting from a spread sheet)

Copy the record data from the spread sheet

[Do not include headings or blank rows, just the data you want to insert]

Go back to database and choose data sheet view.
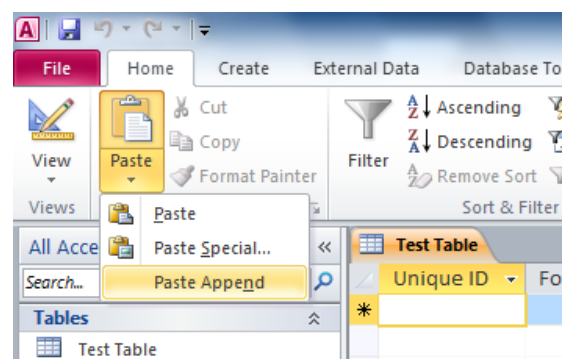
Click on the first field in the first empty record and choose **Paste Append**.

Adding Validation Rules

1. Click on the **View** option and select **Design View**

2. Click on the field to add a validation rule to.

Field Name	Data Type
Title	Text
Quantity	Number
Published	Date/Time
Author	Text
Picture	OLE Object
Hardback	Number
Paperback	Number
Special Edition	Number

Presence Check

1. In the General tab, set the **Required** option to **Yes**.

General	Lookup
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Indexed	Yes
Smart Tags	No
Text Align	General

Restricted Choice

1. In the Lookup tab, set the **Display Control** option to **Combo Box**.

2. Set the **Row Source Type** option to Value List

3. In the **Row Source** option, enter the values allowed (separated with a semi colon)

4. Set **Limit To List** to **Yes**

General	Lookup
Display Control	Combo Box
Row Source Type	Value List
Row Source	Red;Green;Blue;Yellow
Bound Column	1
Column Count	1
Column Heads	No
Column Widths	
List Rows	16
List Width	Auto
Limit To List	Yes
Allow Multiple Values	No
Allow Value List Edits	No
List Items Edit Form	
Show Only Row Source V	Yes

Length Check

1. In the General tab, enter a LEN formula into the **Validation Rule** option.

   (See the examples of length check rules in the table below)

General Lookup	
Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	Len([Title])<10
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

LEN([ISBN]) =17	Check that the ISBN field is **exactly 17** characters long
LEN([Author]) <=20	Check that the Author field contains **20 characters or fewer**.
LEN([Title]) >10	Check that the Title field contains **more than 10** characters

Range Check

1. In the General tab, enter a formula into the **Validation Rule** option.

   (See the examples of range check rules in the table below)

General Lookup	
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	
Validation Rule	>10 AND <20
Validation Text	
Required	No
Indexed	No
Smart Tags	
Text Align	General

>=10 AND <=20	Check that the value entered is between 10 and 20
<20	Check that the value entered is below 20
>50	Check that the value entered is above 50

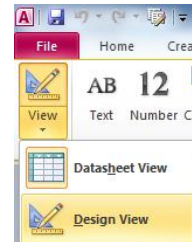## Adding a Picture Field

1. Make sure you have already created a **table** (page 4).

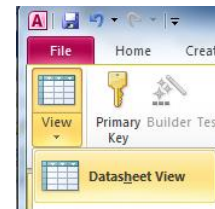2. In the **All Access Objects** section (left hand side), double click on your **table**.
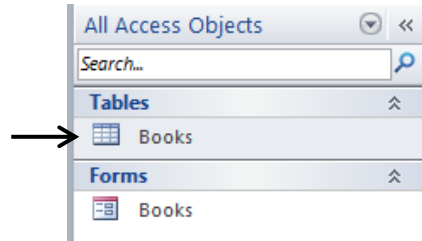
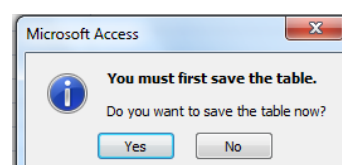3. Click on the **View** option and select **Design View**

4. Add a new field called **Picture** and select **OLE Object** as its *Data Type*.

5. Click on the **View** option and select **Datasheet View.**

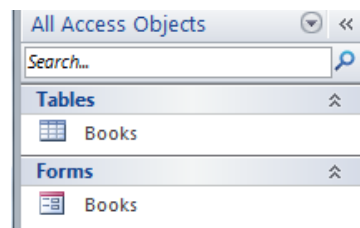
6. Click **Yes** to save your table.

Creating a Form

1. Make sure you have already created a table containing some fields (page 4) ✔

2. Click on the **Create** tab and choose **Form**.
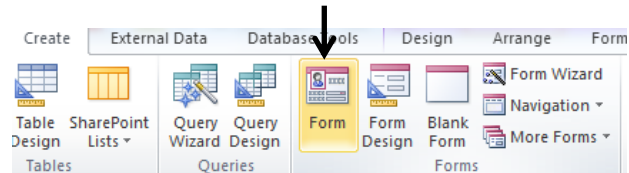
3. Click on the **Save** icon 💾 and give your form a name.
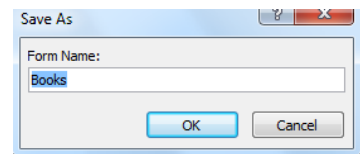
4. You can switch between forms and tables on the left hand side of the screen.

Adding a Picture (to a Form)

1. Make sure you have already created a **table** (page 4).

2. Make sure you have already created a **picture field** (page 8).

3. Make sure you have already created a **form** (page 9).

4. Find the picture file you want to include and right click on it.

5. Choose open with **Picture Viewer**
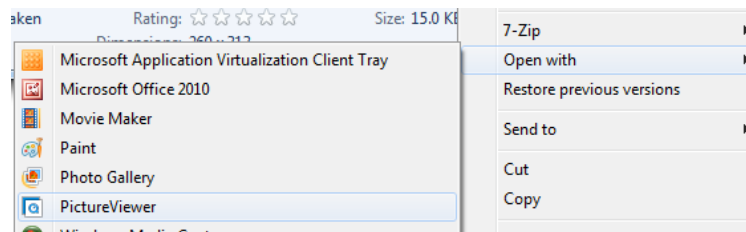
6. From the Picture Viewer **Edit** menu, choose **Copy**.

7. Make sure your form is in **Form View**
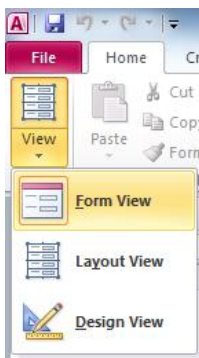
8. In your database form, **right click** on the picture field and choose **paste**.

Creating Queries (Searching)

1. Make sure you have already created a **table** (page 4).

2. Click on the **Create** tab and choose **Query Design**.
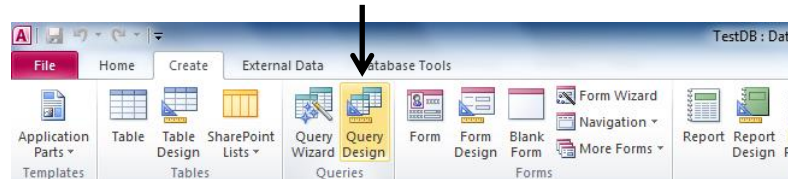
3. Click **Close** without adding any tables
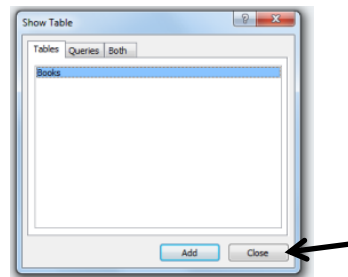
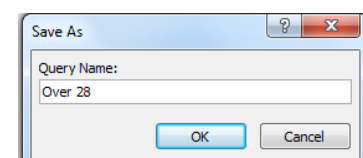4. From the **View** menu, select **SQL View**
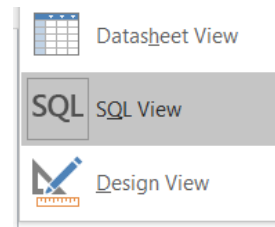
5. Type your query into the space provided.


```
Query3
SELECT [Title], [Quantity], [Author]
FROM Books
WHERE [Quantity] > 10;
```
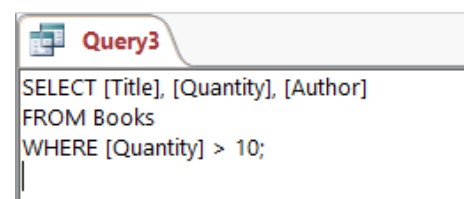
6. Click on the **Run** button to view the results (check that they are correct).
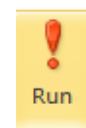
7. Click on the **Save**   icon and give your query a

name.

Creating Queries (Calculations)

1. Make sure you have already created a **table** (page 4).

2. Click on the **Create** tab and choose **Query Design**.
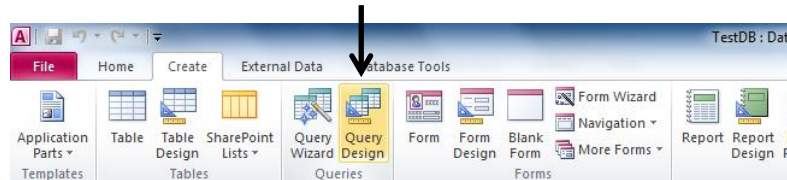
3. Highlight your table and click **Add**, then click **Close.**
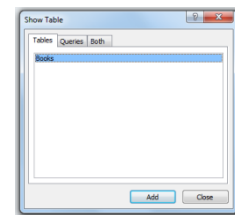
4. Set up your query as follows:

Choose the **fields** you want to show.	Choose the order in which to **sort** your results into	This is where you do the **calculation**. Total is the name of the **field**. **Abs** functions returns a value. The fields to use in the calculation appear in **[]** brackets.

Field:	Title	Price	Quantity	Total: Abs([Price]*[Quantity])
Table:	Software	Software	Software	
Sort:	Ascending			
Show:	✓	✓	✓	✓
Criteria:				
or:				

This example will display the **Title**, **Price**, **Quantity** and **Total**.

The **Total** is **calculated** automatically by **multiplying Price** and **Quantity**.
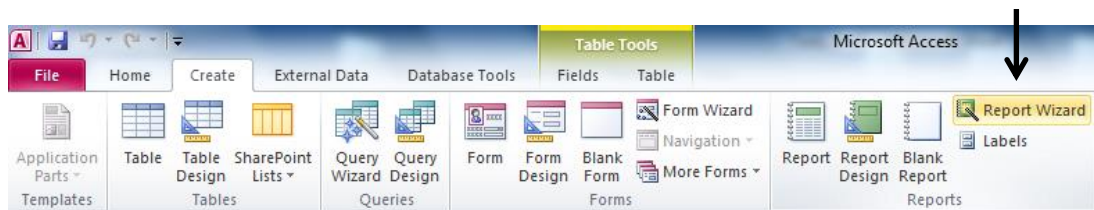Results will be in **Ascending order** of **Title**.

5. Click on the **Run** button to view the results (check that they are correct).

Run
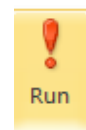
Click on the **Save** icon ![save icon] and give your query a name.

Creating Reports

1. Make sure you have already created a **table** (page 4). ✅

2. Click on the **Create** tab and choose **Report Wizard.**

3. Choose the **table** or **query** you want to create the report from.

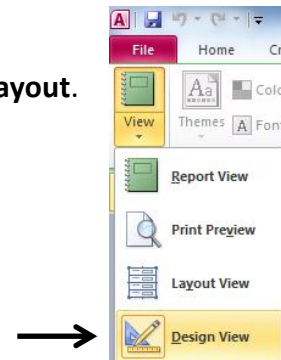4. Use the arrows to select the fields to be included in your report (double arrow selects all).
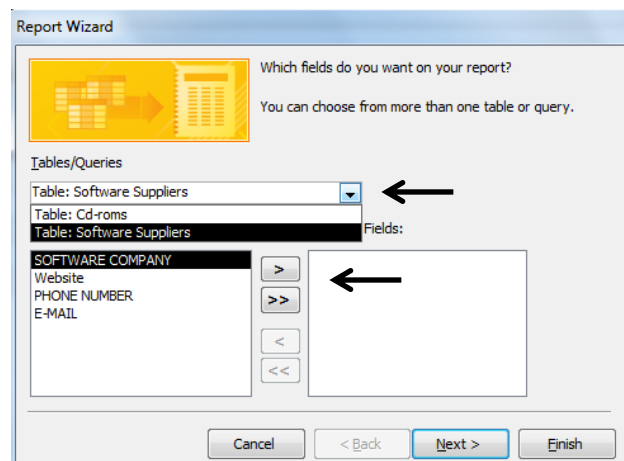
5. Click next twice then change the **orientation** to **landscape** (keep the layout as Tabular

6. Click next and give your report a name, then click finish.
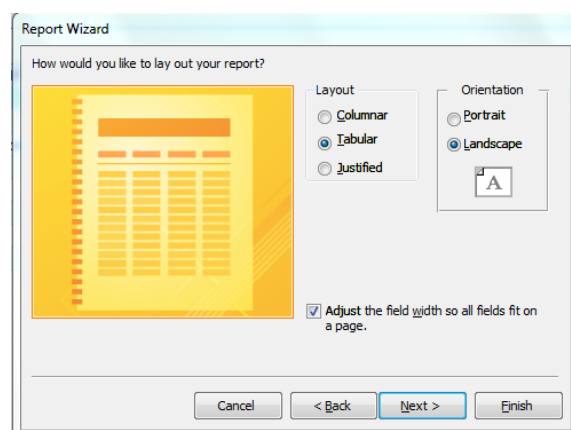
Changing Report Layout

1. Open the report you want to edit and click on **Design Layout**.

2. The title can be changed by typing in the label in report header section**.**
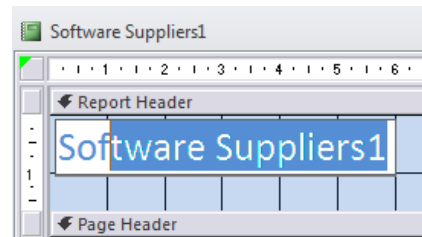
3. Your name can be added by making space in the footer section by adjusting the width of the data label.
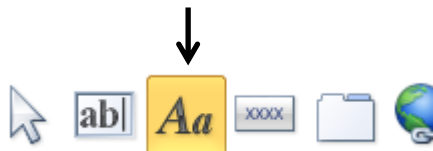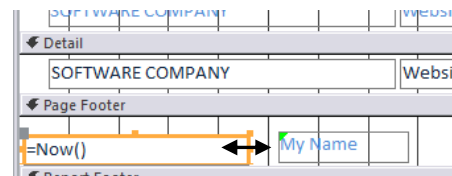
Click on **label** and draw a label in the footer. You can then type your name into the label.

4. You can adjust field widths and positions to allow everything to fit onto one page. - Check that all field boxes are big enough to completely fit the data.
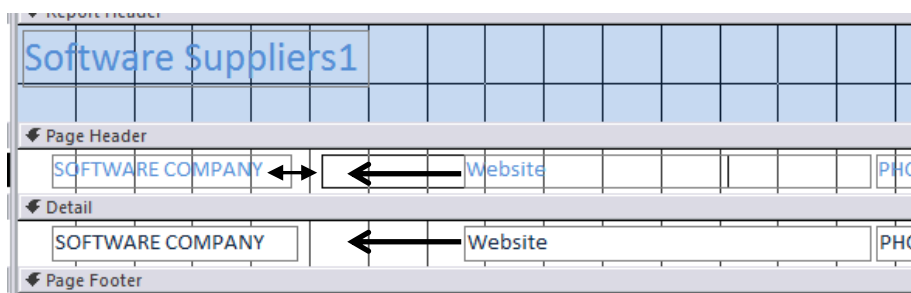
Counting Boolean (Yes/No) Fields

A calculated field can be used to count the number of checkboxes that have been checked for each record.

e.g.

Hardback	Paperback	Special Edition
✓	☐	☐
☐	✓	✓
☐	☐	☐

1 here
2 here
0 here

A boolean **YES** (or checked) counts as **-1** and a boolean **NO** (not checked) counts as **0** using the following formula:

[Hardback]+[Paperback]+[Special Edition]

This would produce the following results:

Hardback	Paperback	Special Editi	Total
✓	☐	☐	-1
☐	✓	✓	-2
☐	☐	☐	0

To make a YES count a **1** instead of **-1** then the **Abs** (absolute) function should be used as follows:

Abs([Hardback]+[Paperback]+[Special Edition])
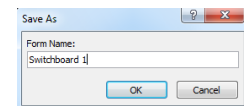
Creating a User Interface

1. Click on the **Create** tab and choose **Blank Form**.
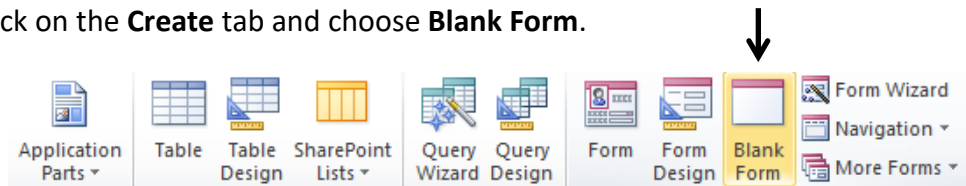
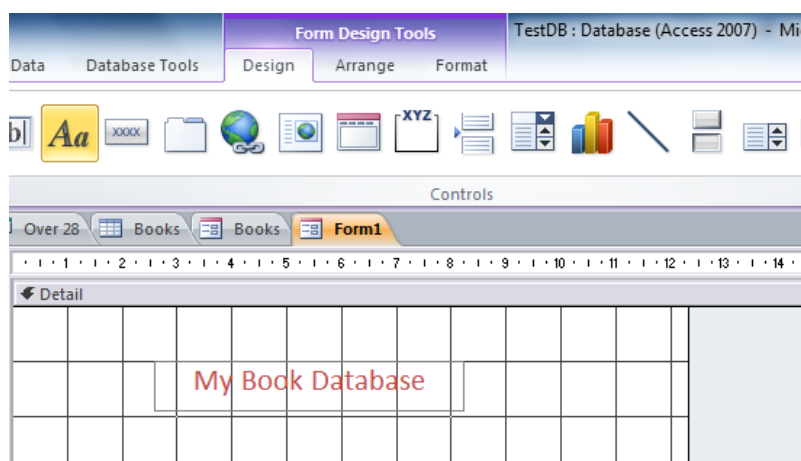
2. Click on the **View** option and select **Design View**
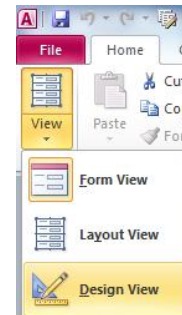
3. Click on the **Save** icon   and give your switchboard form a name.
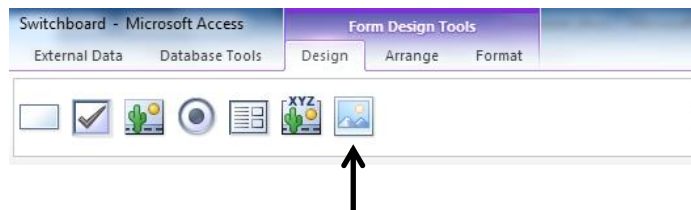

Adding a Title

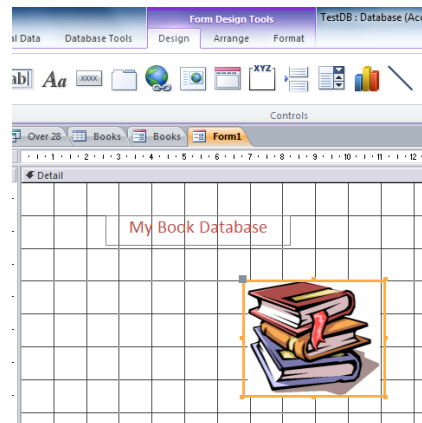1. Select the **Label** tool from the **Design** menu

2. **Draw** the label onto the blank form

3. Type the title of your switchboard into the label.

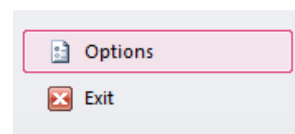### Inserting an Image

1. Select the **Image** control from the Design menu

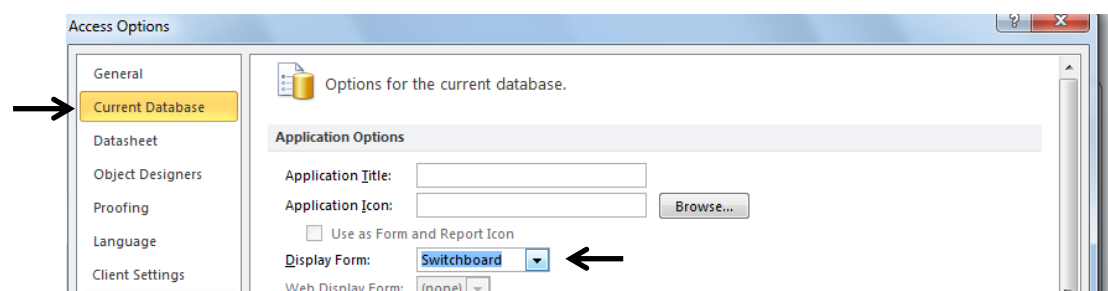2. **Draw** the picture frame onto your form

3. Select a picture from file and click **Open**.

Setting Switchboard as Start-up Form
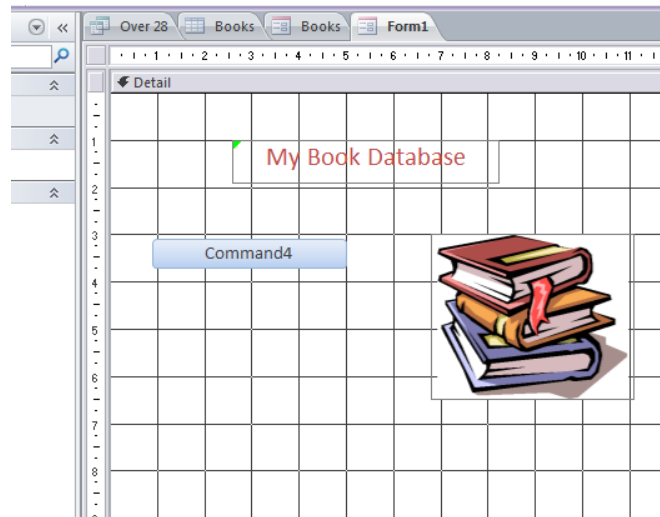
1. From the File menu, choose **Options**.

2. In the **Current Database** section, change **Display Form** to your switchboard name.
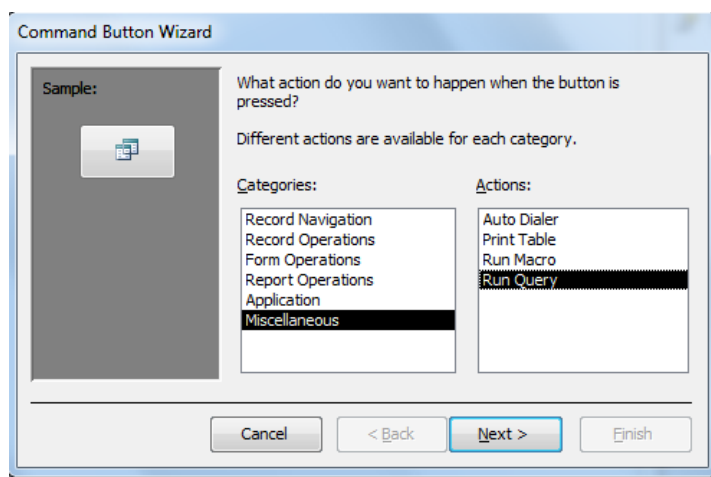
Adding Buttons

1. Select the **Button** tool from the **Design** menu

2. **Draw** the button onto your form

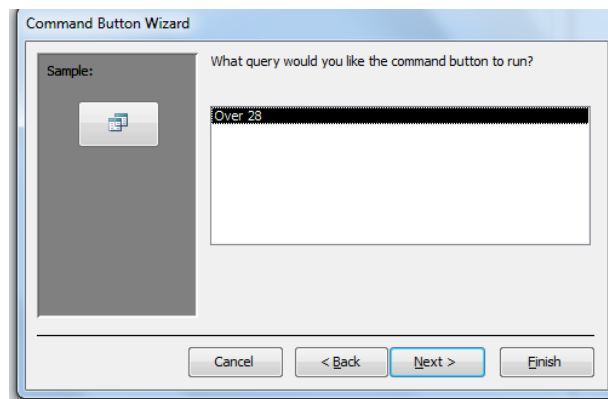3. Next, choose the **Category** and **Action** to perform.

   Mostly, you will be selecting the **Miscellaneous** category and either:
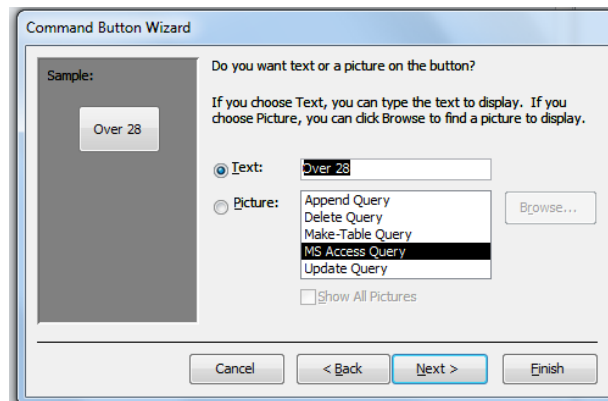
   - **Run Macro**
   - **Run Query**

4. Click **Next**

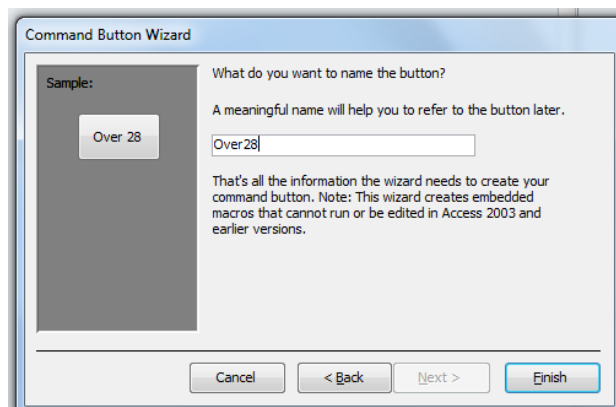5. Choose the query or macro from the list that you want to attach to the button.

6. Click **Next**

7. Select the **Text** option and type in the text you would like displayed on the button.

8. Click **Next**
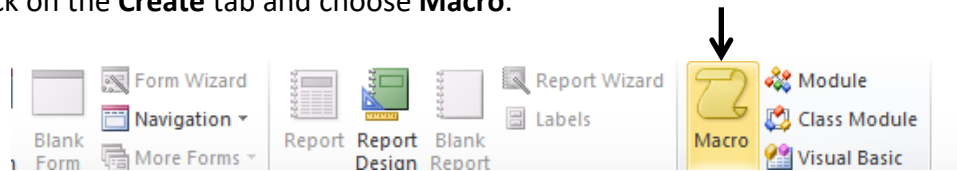
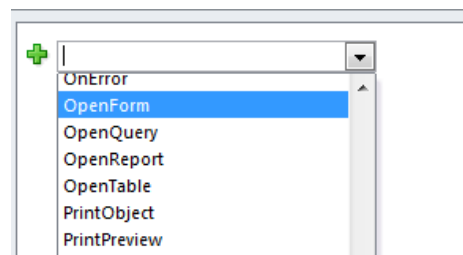9. Give the button a meaningful name

10. Click **Finish**

Creating Macros

Macros are attached to buttons (page 12). They are used to automatically carry out a task when the button is clicked.
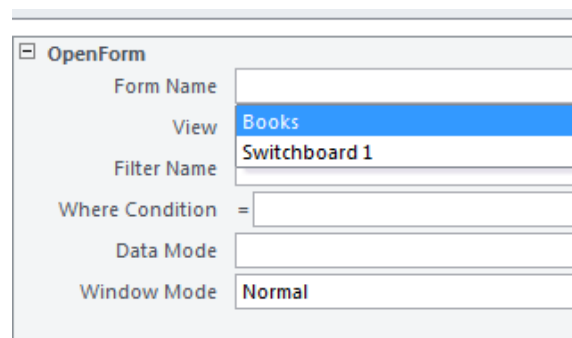
1. Click on the **Create** tab and choose **Macro**.

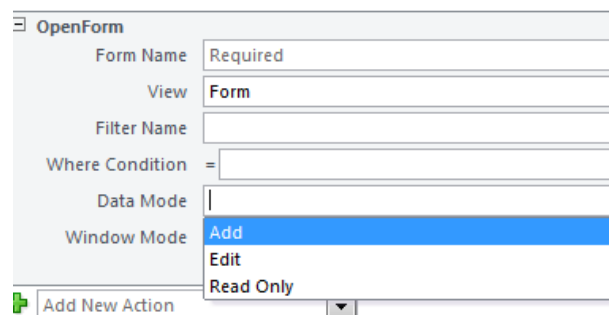2. From the first drop-down, choose **OpenForm.**

3. Under **Form Name**, select the form you would like to be opened.

4. Under **Data Mode**, choose **Add** or **Read Only**.

> *Add* will allow the user to add a new record
>
> > *Read Only* will only allow the user to view records.

5. Click on the **Save** icon 💾 and give your macro a name.
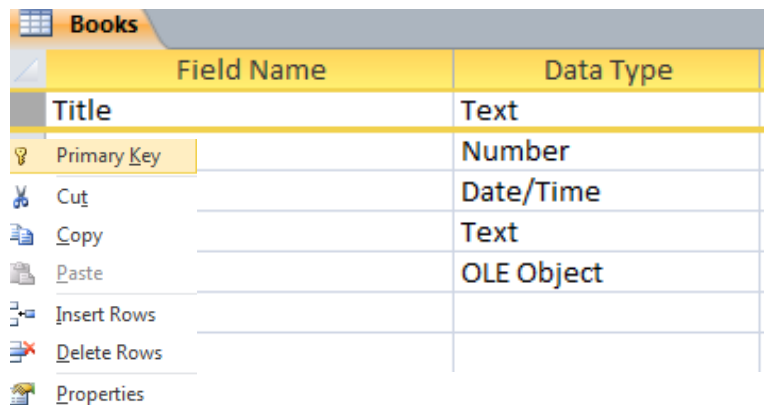
Primary Key (Relational Databases)

Firstly, you must identify a field that will contain a unique entry for each record. This is the **Primary Key** field.

In this Books database, each book will have a **different name** so the **Title** field can be set as the key field.
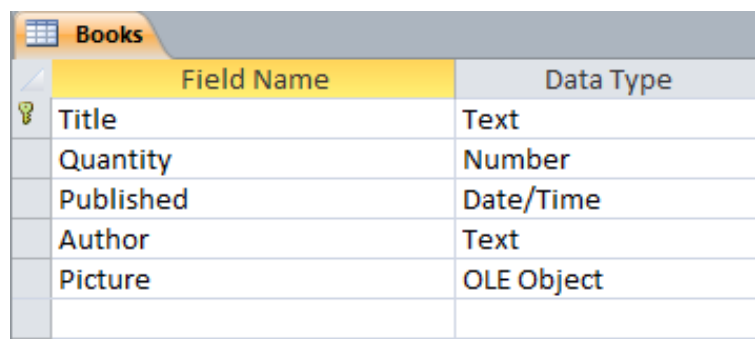
1. Open the table in **Design View**.

2. **Right click** on the field you want to set as a primary key field.

3. Choose **Primary Key.**

4. A small key should now appear beside the selected field to indicate that it is a Primary Key.

5. Click on the save icon to save your changes.

Note:

The primary key field must now be filled in for **every** record and each record must contain a **different** value in the field.
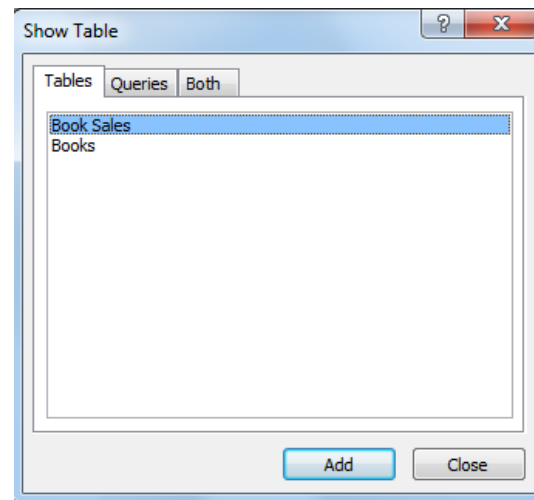
Linking Tables (Relational Databases)

Firstly you must identify the **primary key** in the main table and the **foreign key** in the other table.
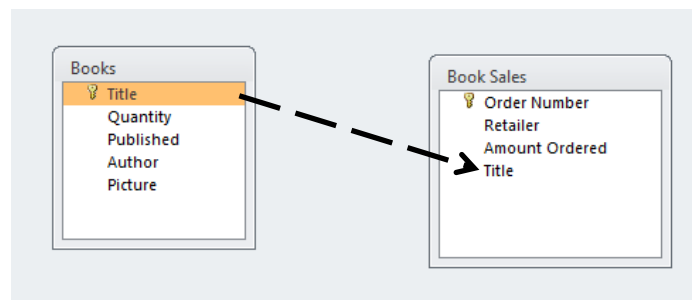
1. Make sure the both tables are **not** currently open.

2. From the **Database Tools** section, choose **Relationships**.
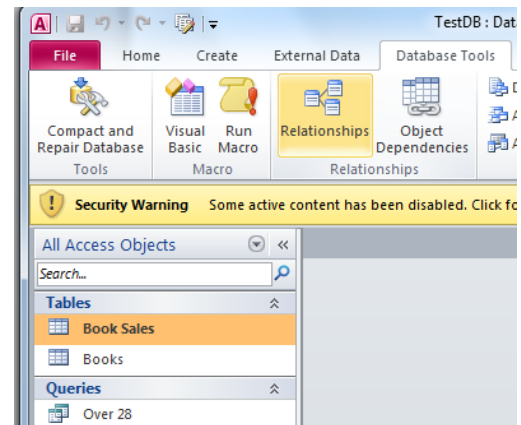
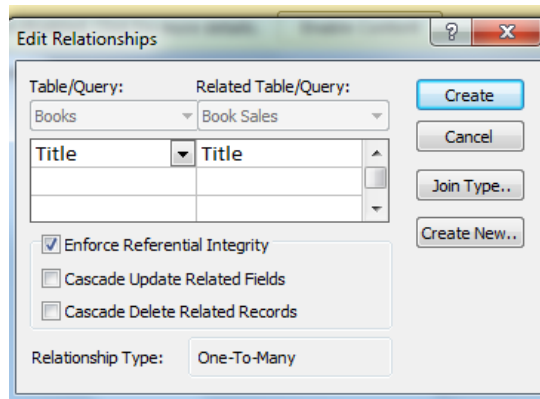3. Add **both** tables then click **Close**.

4. Click on the primary key in the main table and drag your mouse over to the foreign key in the other table.
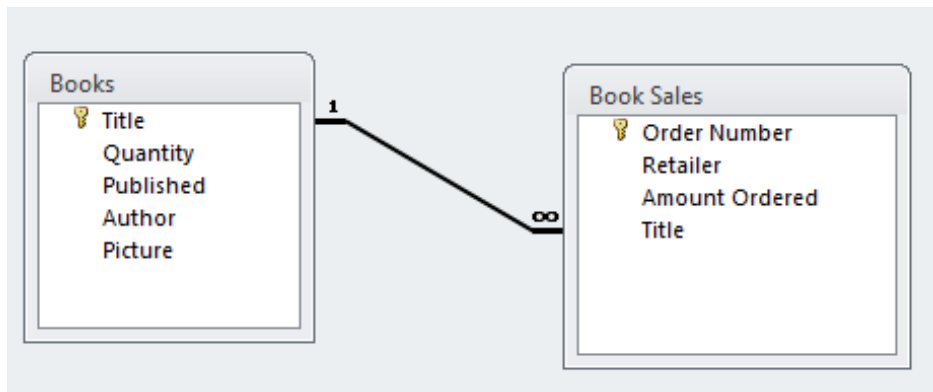
5. Tick the box to **Enforce Referential Integrity**.

6. Click **Create**.

7. A line will now indicate the relationship between the tables (1 to Many).

Note:

The above example means that every **book** can have many **book sales**.

8. Click **Save**.

The main table will now have a + sign next to each record that links to corresponding records in the linked table.