Intermediate Microsoft Access 2016

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Using More Than One Table

Often times a database will have more than one table. For example, in a Customer database, one table might contain information about each individual customer and another table might hold information about which items they ordered.

In order for the user to query information found in multiple tables, a relationship between the tables must be defined.

Understanding the Types of Relationships in an Access Database

One-To-Many Relationship
One record in a table is related to many records in another table. An example would be that one customer can place many orders.

A Many-to-Many Relationship
A good example of this would be between a Products table and an Orders table. A single order can include more than one product. On the other hand, a single product can appear on many orders.

A One-to-One Relationship
Each record in the first table can have only one matching record in the second table, and each record in the second table can have only one matching record in the first table.

Relationships Between Tables

To Create a Relationship Between Tables:
1) Click the **Database Tools** tab
2) Click **Relationships**

To Define the Relationships between the Tables in your Database:
1) Click **Show Table** in the Relationships group
2) Double-click on the tables to add them to the Relationships window
3) **Close** Show Table when done adding tables
4) Drag a field (typically the primary key) from one table to the common field (the foreign key) in the other table
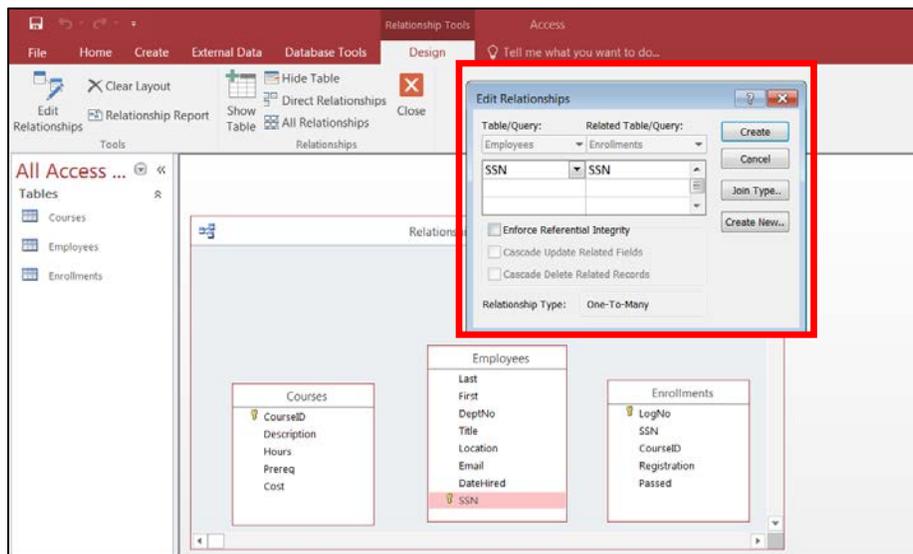

5) Verify that the field names shown in **Edit Relationships** are the fields for the relationship. If a field name is incorrect, click on the field name and select the appropriate field from the list.
6) To enforce referential integrity for this relationship, select **Enforce Referential Integrity**. (This is explained below.)
7) Click **Create**
8) Click **Close** on the Design tab
9) Click **Yes** to save changes

Referential Integrity

Enforcing referential integrity ensures that the following three rules will not be broken:
- You are unable to enter a value in the foreign key field of a child table if that value doesn't exist in the primary key of the parent table.
- You are unable to delete a record from a parent table if matching records exist in a related table.
- You are not able to change the value in the primary key field if that record has related records in another table.

The relationships window will show a line between the related fields as shown below.
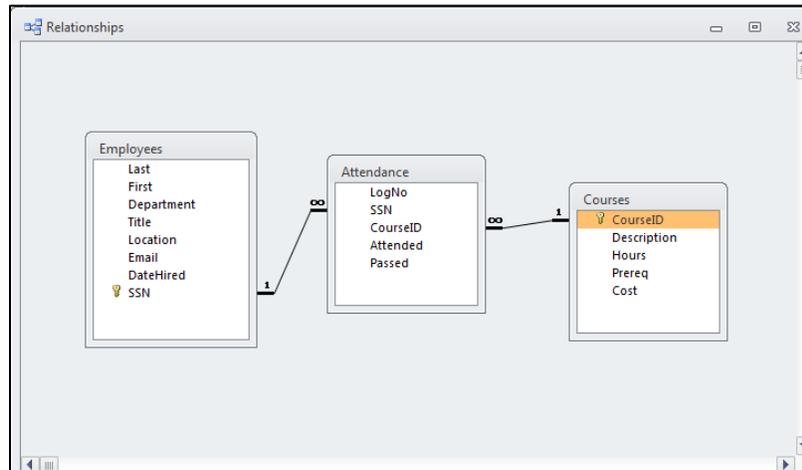
On one end of the line is a "1" indicating the "one" side of a one-to-many relationship.

The other end of the line will have an infinity symbol next to it to show that there are potentially many entries on the "many" side of the one-to-many relationship.

Cascade Update Related Fields:
If this item is selected, the following rule applies:
Access will automatically update any foreign key values in the "child" table (the "many" table in a one-to-many relationship) if you change a primary key value in a "parent" table (the "one" table in a one-to-many relationship).

Cascade Delete Related Records:
If this item is selected, the following rule applies:
Record(s) in the "child" table will be deleted when a related record(s) in the "parent" table are deleted.
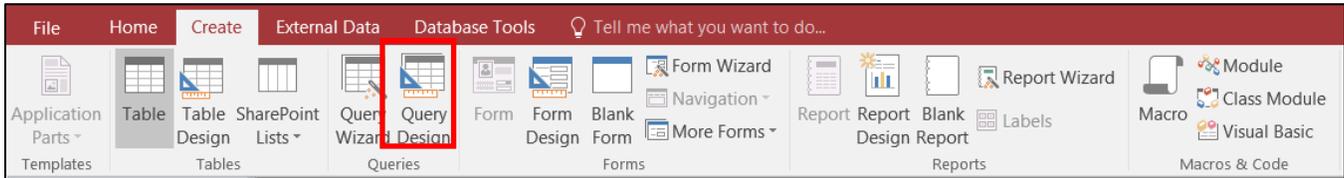
Creating Queries

Using *AND* Logic in a Query:

Using **AND** logic in a query will return records in which one condition is true AND another condition is also true. For example:

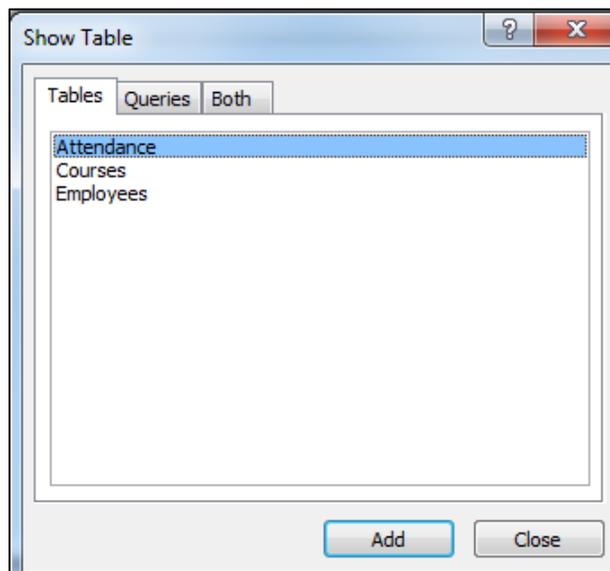**To Find all Employees Who Attended Access Training and Passed**:
1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group

In order to add fields to the Query Grid, you must first add the tables that the fields are in.

To Add Tables to the Grid:
1) Double-click on the tables needed for the query
2) **Close** the Show Table window when all the tables have been added

3) Double-click on the fields to add them to the Query Grid
4) In the Criteria Row, type in the criteria

The criteria entered for this example is as follows:

CourseID field criteria: Access*
This will locate any Course ID that begins with the word Access and ends in anything. The asterisk * is used as a wildcard.
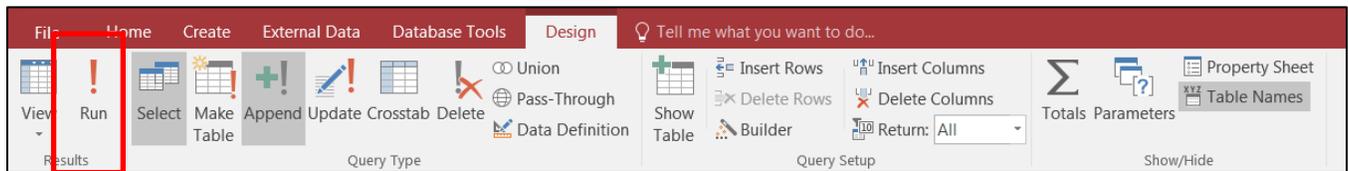
Passed field criteria: Yes
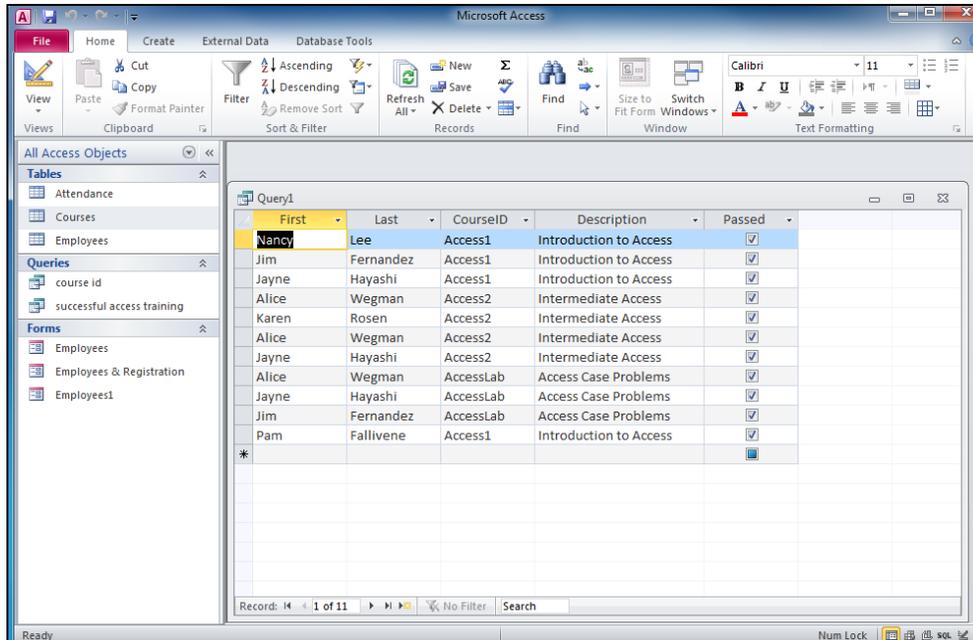This will locate any records of individuals who have passed Access.

If both of these criteria exist on the same row of the query, it creates **AND** logic.
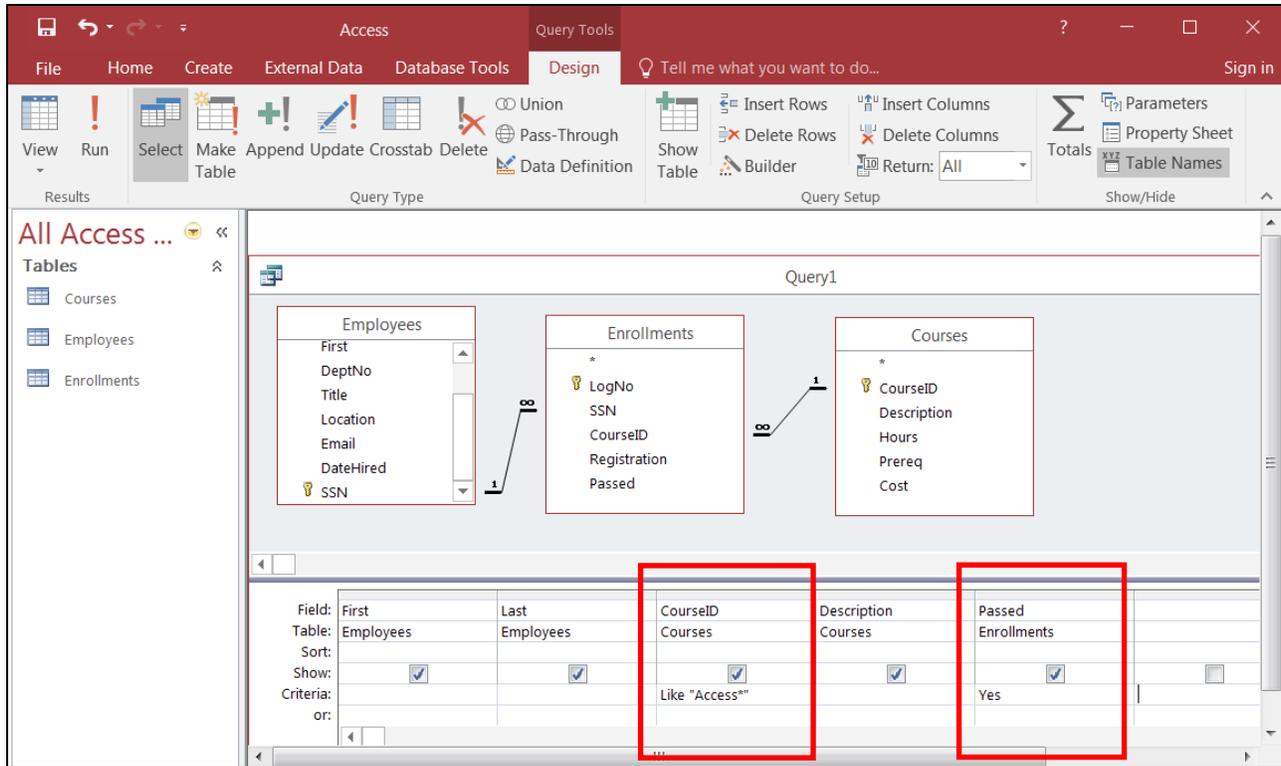
5) Click **Run** to execute the query

The results of this query are displayed below:

Saving a Query

When you save a query, what you are saving is really the question you are asking, not the results that you see when you run a query. For example, in the above query we asked to display any records where the Course ID contains the word "Access" and the Passed field is "Yes". If we run that query next week, we are likely to see more records as a result.
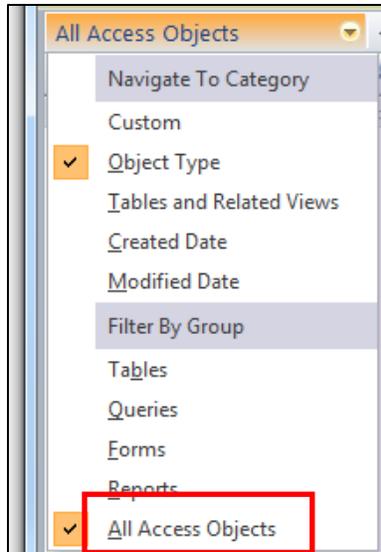
To Save the Query:
1) **Close** the query
2) Click **Yes** to save the query
3) Enter a name for the query
4) Click **OK**
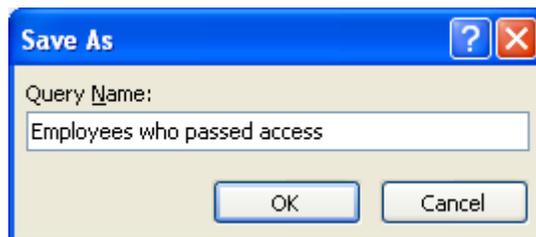
If you don't see the query in the Navigation Bar you need to select **All Access Objects** in the Navigation Bar:

1) Click on the Navigation bar drop-down arrow
2) Select **All Access Objects**

Creating *OR* Logic in a Query

OR logic is based on the fact that either condition(s) can be true in order for a record to be included in the results of the query.

To Create a Query Using OR Logic:
1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group
3) Double-click on the tables needed for the query
4) **Close** the Show Table window when all the tables have been added
5) Double-click on the fields to add them to the Query Grid
6) In the Criteria Row, enter the criteria for the query. By placing criteria on two separate rows in the grid, OR logic is automatically created.

Below is an example of OR logic in a query:
- Course ID field criteria: Access*
- Course ID Field criteria: Excel*
- Passed field criteria: Yes

This will locate any records of individuals who have attended Access or Excel and Passed.

7) **Run** the query

Using a Calculated Field in a Query

A query can be used to perform calculations. In this example, we will create a new field in a query "Hourly Rate" to calculate the hourly rate per course.

To Create a Calculated Field:
1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group
3) Double-click on the tables needed for the query
4) **Close** the Show Table window when all the tables have been added
5) Double-click on the fields to add them to the Query Grid. In this example we are adding the **Course ID**, **Cost** and **Hours.**
6) Click in an empty **Field** cell in the Query Grid
7) Type the name of the new field (in this example type **HourlyRate**) followed by a colon, a space and then the formula: *HourlyRate: [cost]/[hours].* Square brackets [ ] are needed for the field names.

Field:	CourseID	Cost	Hours	HourlyRate: [Cost]/[Hours]
Table:	Courses	Courses	Courses	
Sort:				
Show:	✓	✓	✓	✓
Criteria:				
or:				

8) **Run** the query. This creates a new field in the query titled **HourlyRate**.

CourseID	Cost	Hour	HourlyRate
Access1	$300	12	25
Access1	$300	12	25
Access1	$300	12	25
Access1	$300	12	25
Access1	$300	12	25
Access1	$300	12	25
Access2	$400	24	16.666666667
Access2	$400	24	16.666666667
Access2	$400	24	16.666666667
Access2	$400	24	16.666666667
AccessLab	$200	12	16.666666667
AccessLab	$200	12	16.666666667

To Format the Field to Currency:
1) Switch to **Design View**

2) Right-click on the **HourlyRate** field in the Query Grid
3) Select **Properties**
4) Click in the **Format** line in the Property Sheet and click on the drop down arrow
5) Select **Currency**
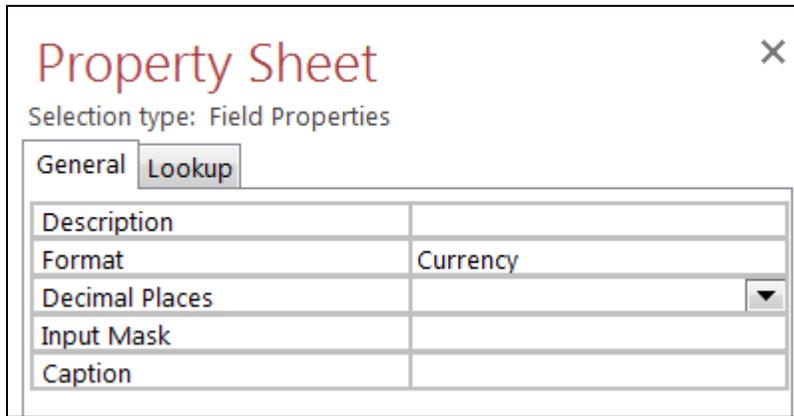
6) **Close** the Property Sheet
7) **Run** the query

Below are the results:

Creating a Summary Query

To summarize records in a table, use the **Group By** and **Sum** function in a query.

To Summarize a Field in a Query:
In this example we will create a query to see total cost per location.

1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group
3) Double-click on the tables needed for the query
4) **Close** the Show Table window when all the tables have been added

5) Double-click on the fields to add them to the Query Grid. We are adding **Location** and **Cost** in this example.
6) Click the **Totals** icon on the Ribbon

7) Notice the **Total** row has now been inserted into the Query Grid
8) Select **Group by** for the **Location** field to group the locations together
9) Select the **SUM** function for the Cost field to sum the cost per location
10) **Run** the query

Below are the results based on the criteria above:

Including Operators in a Query

You are able to create criteria based on the following operators:
      <   Less Than
      >   Greater Than

<=   Less Than or Equal To
>=   Greater Than or Equal To
=   Equal To
<>   Not Equal To

You are also able to define criteria based on a range.

To Locate Specific Records Within a Range of Dates:
In this example, we are creating a query to find the registration for the month of February.

1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group
3) Double-click on the tables needed for the query
4) **Close** the Show Table window when all the tables have been added
5) Add the necessary fields to the Query Grid. In this example we are adding **First** and **Last** name, **CourseID** and **Registration**.
6) After adding the fields to the Query Grid, position your cursor in the criteria row for the field you are defining. In this example **Registration**.
7) Enter the criteria: **Between 2/1/2006 and 2/28/2006**. When you tab to the next column # symbols will be added to the dates as below:

Between #2/1/2006# And #2/28/2006#

In the example below, the criteria is to identify records where the registration date is between February 1, 2006 and February 28, 2006.

Field:	First	Last	CourseID	Registration
Table:	Employees	Employees	Enrollments	Enrollments
Sort:				
Show:	✓	✓	✓	✓
Criteria:				Between #2/1/2006# And #2/28/2006#

8) **Run** the query

Creating and Using a Parameter Query

In a **Parameter Query** the criterion written on the criteria line is actually a prompt to the user of the query to type in a criterion. The prompt must be enclosed in square brackets [ ] on the criteria line. When executed, the query will display a prompt, and the user will enter the criterion he or she wishes to use. When the Parameter Query is run, the prompt written on the criteria line will display as shown below.

To Create a Parameter Query:
1) Click the **Create** tab
2) Click **Query Design** in the **Queries** group
3) Double-click on the tables needed for the query

4) **Close** the Show Table window when all the tables have been added
5) Add fields to the Query Grid. In this example we are adding **First** and **Last** name, **Location** and **CourseID**.
6) Position your cursor in the criteria row for the field that you would like to create the parameter for. In this example, we want to be prompted to see registration via the **CourseID**.
7) Type: **[Enter Course ID]**

Field:	First	Last	Location	CourseID
Table:	Employees	Employees	Employees	Courses
Sort:				
Show:	✓	✓	✓	✓
Criteria:				[Enter Course ID]
or:				

8) **Run** the query
9) Type the Course ID you wish to see registration for and click **OK**

Enter Parameter Value

Enter Course ID

Excel1

OK   Cancel

Forms

Forms are used to either view records that are in a table, or used as a way to enter records into a table.

To Create a Form:
1) Select the table from the Navigation Pane that the form will be based on
2) Click the **Create** Tab
3) Click on **Form**

The form is created in Layout View.

There are 3 basic views in an Access form:

Layout View
The form is actually "live" in this view, so you can see your data as it will appear in Form view. However, you can also make changes to the form design in this view. Because you can see the data while you are modifying the form, this is a very useful view for setting the size of controls or performing almost any other task that affects the appearance and usability of the form.

Design View
This view gives you a more detailed view of the structure of your form. You can see the header, detail, and footer sections for the form. The form is not actually running when it is shown in Design view, so you cannot see the underlying data while you are making design changes; however, there are certain tasks you can perform more easily in Design view than in Layout view. In this view you can add controls to your form, edit control sources and resize form sections.

Form View
This view is used to enter, edit or display data in your table.
There are 3 main sections of an Access form:

These are the **Header, Detail** and **Footer**. If data is in the Form Header, the data will display/print at the top of the form only. Data in the Detail section is records from the table or query that the form is based on. If there is data in the Footer section, the data will display/print at the bottom of the form.

These 3 main sections are available in **Design View**.
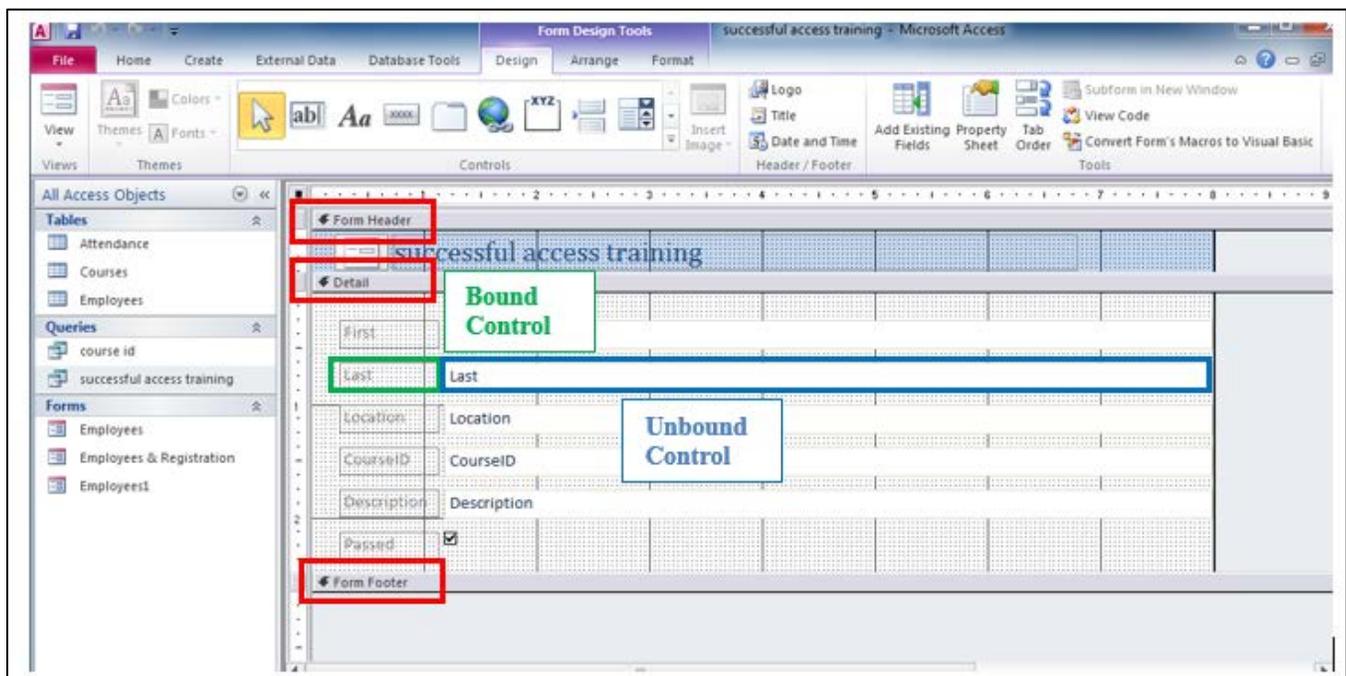
Understanding Controls on a Form

Forms are made up of 3 things: **Bound Controls, Unbound Controls** and **Calculated Controls**. A **Bound Control** is a control whose source is connected to a field or query. An **Unbound Control** is a control that is not connected to a source such as a field in a table or query. An example of this type of control is a title on a form, a picture, line or other label. A **Calculated Control** is a control whose source is a formula or expression.

On a form, there are two types of commonly added controls: a **label control** and **text box control**. A **label control** will allow you to simply add text to a form. A **text box control** will allow you to add a field from a table/query.
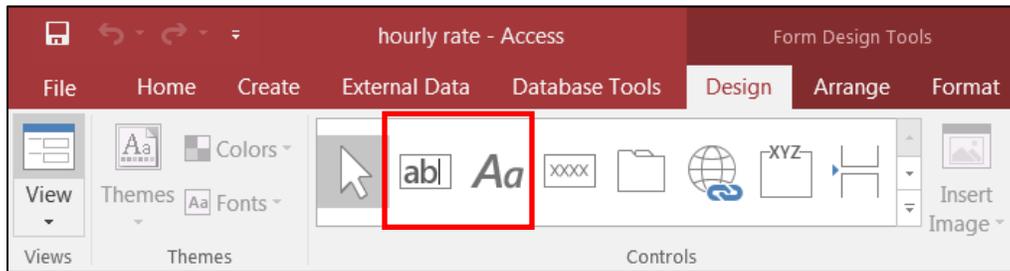

To Add a Label Control to a Form:
1) Switch to **Design View**
2) Click **Design** under **Form Design Tools**
3) Click the **Label** icon
4) Click your mouse where you would like to add the text
5) **Type** the text

To Add a Text Control to a Form:
1) Switch to **Design View**
2) Click **Design** under **Form Design Tools**
3) Click on the **Text Box** icon on the toolbar
4) Click on the form where would like the control to exist

Below is a picture of a text box control that has been added to a form:
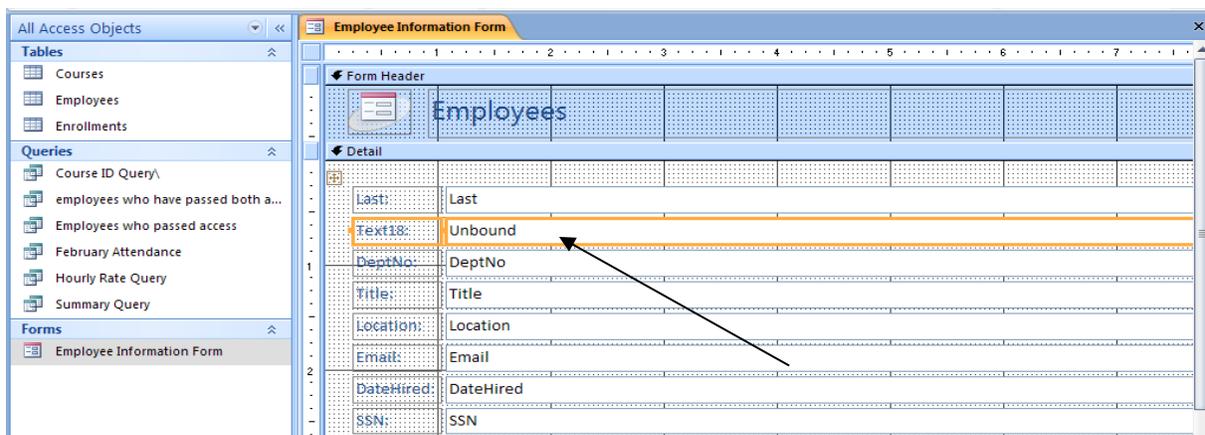
Text18 is the label for the control. **Unbound** means that there is no connection between a field in a table/query and this control.

To associate this control with a field in a table/query:
1) Right-click where it says Unbound
2) Select **Properties**

3) In the **Property Sheet**, on the **Control Source** row, select the field that you would like to associate the control with
4) **Close** the Property Sheet window
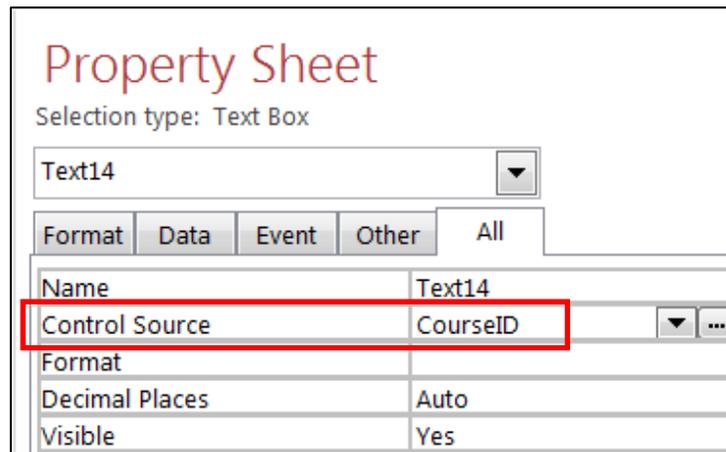
**To Edit the Label to the Left of the Control you just Added**:
1) Double-click on the **Label Control**
2) Type the name of the label
3) Hit **Enter**

To Move a Control:
1) Select the **Arrange** tab under **Form Design Tools**
2) Click **Remove Layout** from the **Table** group
3) Click on the control you wish to move
4) Click and drag the control to a new location on the form

To Change the Tab Order on a Form:
1) Right-click on the form
2) Choose **Tab Order**
3) Click to the left of the field
4) Click and drag the control to a new position in the Tab Order window
5) Click **OK**
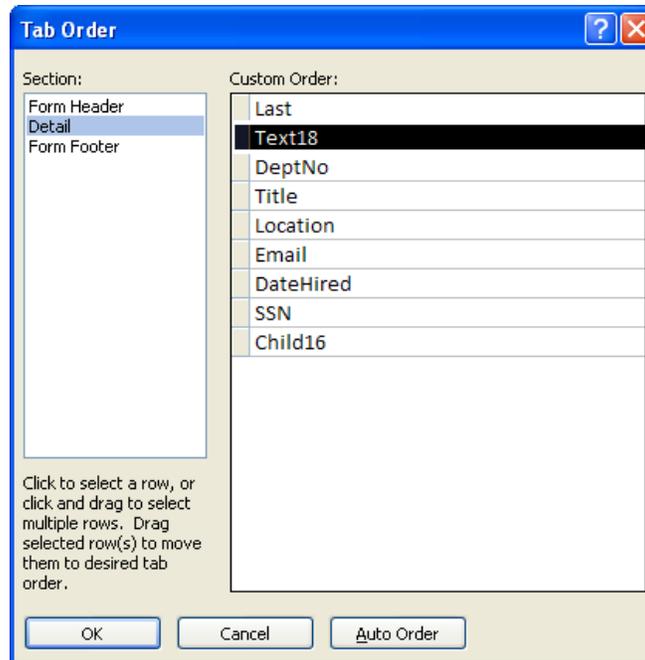
To Add a Calculated Control to a Form:

1) Switch to **Design View**
2) Click on the **Design** tab under **Form Design Tools**
3) Click on the **Text Box Control** icon
4) Click on the location on the form where you want to add the new control
5) Right-click where it states Unbound
6) Choose **Properties**
7) On the **Data** tab, click to position your cursor in the Control Source field
8) Enter a formula. For example; **=Sum([cost])**
9) Close the Property Sheet window

Reports

In order to capture the data that you would like to report on, you must first create a query to identify the records to be included in the report. After you have created the query, you need to think about the design and layout of the report.

To Create a Report Based on a Query:

1) Open the query that the report will be based on
2) Click the **Create** tab on the Ribbon
3) Click **Report**
4) A report will be created for that query/table and opens in **Layout View**

Reports are similar to Forms in that they are made up of sections and controls. To change and move controls or add additional controls, switch to **Design View**.