**Access**

Access is a database. That means that it was built to handle text and numbers, compared to Excel that really was built just to handle numbers. Access can handle larger datasets than Excel and you can have more than one table in your database. You can also create relations between your tables. The biggest difference is that you don’t change your data while working in Access – instead you do all your work in queries. The result of queries looks like a table. That can be a little confusing to start with.

Being a database means that every field, or column, has to have a data type. That means that you have to define whether the data is numbers, or text or a date. It also mean that if you try to upload text into a numeric field you’ll run into problems. The great thing with Access compared to other databases is that you don’t have to define your fields before uploading data.

**Get to know Access.**

Start the program and click on the icon that says blank database. Chose where you want to store your database and click **Create** to create it. This is also a difference from Excel where you first handle your data and then save. Here you define your database and once you’ve done that, everything is saved automatically. Just as other Microsoft programs you have a number tabs with different functions. We will mostly work in the HOME and CREATE tabs. In the HOME tab, up in the left corner, there is a symbol with a pencil, a ruler and a triangle. Take a notice on that – it is one of the more important buttons in Access.

**Uploading**

Let’s start by uploading data from an Excel file. I’ve made a file with all the speakers at the conference, where they are from and their title. Click on the EXTERNAL DATA tab and then on the Excel button. Find your file and click **Open**, then click **OK**. The import guide is helping you upload the data. Make sure that Speakers is selected and click on **Next**. Make sure that you click in the square that says **First row contains column headings** and click **Next**. The third screen helps you set the data types for the columns (fields) – in this case just click **Next**. Fourth screen is about the primary key. A primary key is a way to find the rows in your database easier – in this case we have a primary key already, so click on **Choose my own primary key** and make sure that # is selected. Click on **Next**. Finally, enter the name of the table, Speakers, and click **Finish** and then **Close**. Your first table is uploaded.

**Tables**

Before we do anything else, let’s get rid of the table called Table1. Right click on the tab that says Table1 and choose **Close**. The table is gone. Now double click on the table Speakers. It opens and you might see that it has five fields with data – and then three fields that seem to be empty. Let’s get rid of them. Go to the HOME tab and click on the button I mentioned before, the pencil, ruler and triangle one. It says View and when you click on it you see the definition of the Speakers table. You see the field names and the data types. Select the unwanted fields and use your delete button to delete them. You can also click on the button that says **Delete rows**. Then click again in the upper left corner to get back to the table.

This looks like Excel, doesn’t it? But, this is tables – when we do work in Access we do that work in queries.

**Selections**

So, let’s start our first query: Click on the tab that says CREATE and the choose **Query Design**. Choose your table (there is only one) and click **Add** and then **Close**. If you happen to click Add twice, you will get two tables in your window. Just right click on one of them and choose **Remove table**.

Unlike Excel you can chose not to include all columns (fields) when you do your queries. So start by just choosing the name and workplace, by double clicking on each on the fields. You see that they end up in the grid at the bottom of the window. Run your query by clicking on the red exclamation mark (!). So now you have a list with only two fields. So, how do I get back to the query? You click on the button in the upper left corner, the pencil, ruler and triangle one. Let’s say we wanted to just see the people working for The Guardian. In the grid there is a row called **Criteria** - go to the cell under Workplace and write ***The Guardian***. You don’t have to add quotes, but when you leave the cell you see that Access has added them. Run you query by clicking on the red exclamation mark. (!)

Review the result and then go back to the query by clicking on the pencil, ruler and triangle button. As you can see there is an **or:** under **Criteria** in the grid. That means that we can do two conditions in one query. So add ***Swedish Television*** in the second row under Workplace and press ! Now you see people from both organisations. But what if we’re not sure exactly how something is spelled. Go back to the grid and erase Swedish Television from it. Then change so that you say ***LIKE “\*guardian\*”*** in the first Criteria row. Run your query – and see the different result. You can save your query by right clicking on the query tab and then choose **Save**. Enter a name of your query. Right click again and choose **Close** to close your query.

So, select vertically by selecting which fields (columns) you want – and select horizontally by using the Criteria rows in the grid writing conditions.

**Sorting**

Of course it’s possible to sort your data. Start by creating a new query. Go to the CREATE tab and click on **Query Design**. Choose your table by clicking **Add** and the **Close**. And select your fields by double clicking – in this case let’s choose ***Name***, ***Workplace*** and ***Title***. Let’s sort on Workplace. We do the sorting in the grid. First row in the grid says **Sort:** Click there under Workplace and choose **Ascending**. Then run the query to see the result. Go back to the grid by clicking on the button in the upper left corner.

Say that you now wants to sort them first after workplace and then after name. In Access you have to change the order of the columns (fields). So start by clicking on the top of ***Workplace*** and drag the column to the left of ***Name***. Click under ***Name*** to add the sorting for name as well and choose **Ascending** here too. Run the query. Save the query and close.

**Counting**

One of the great advantages of Access is how easy it is to count and sum stuff. Let’s start with looking at how many people there are from each organisation. Start a new query by going to the CREATE tab and choose **Query Design**. Choose your table by clicking **Add** and **Close**. We know we want to count how many there are from each workplace, so start by double clicking on ***Workplace*** to put it on the grid. We have to count something so let’s choose ***Name*** by double clicking on ***Name*** as well. Then take a look at the grid – there doesn’t seem to be any place for counting. The solution is up on the DESIGN tab. Do you see the big sigma (Σ) sign that says **Totals**? Click on that and there is a new row in the grid that says **Total:** and **Group by**. Leave the first Group by alone and click on the Group by that is right under Name. Change to **Count**. Run the query.

Go back to the grid. It also possible to combine the counting and the sorting so go to ***Name*** and change the sorting to **Descending**. Run the query again. Which organisation contributes with the most people? Save the query and close.

If you have a numeric field you can of course select **Sum** instead and sum the field for each name.

Quite often you have to code data to make it more understandable. In this case I have made an extra column, Coded title. This is to make it easier to understand the data. Create two queries, one where you sum up the actual title and how many persons there are for each title, and one when you use my coded one. Sort both queries on the number of people for each title.

**Cross-matching**

One final benefit of is the ability to cross match – connect two tables to each other. This is useful in several ways, for example if you want to join data from two different sources. You might have gotten data about the number of schools by county from the school board or education agency. That will not be any good unless you match that with the number of kids by county, so you get that data from your statistical agency and you join the two tables on county. By doing that you will get both data set aligned and can easily do the calculations in Access or copy the dataset out to Excel and continue your analysis there. It’s also very convenient if you want to find out if data exists in two different tables. For example you have historical information about retired politicians in one file – and you have a list of all lobbyists in another. By cross-matching you can find out if there is any politician that has taken up lobbying in his old days.

Let’s start by uploading a second table. You find this table in the excel file we used earlier. Go to the EXTERNAL DATA tab and click on the Excel button. Find the same file, Speakers.xlsx, but this time choose the second sheet, **Panels**. Click **Next**. Make sure that you click in the square that says **First row contains column headings** and click **Next**. The third screen helps you set the data types for the columns (fields) – in this case just click **Next**. Fourth screen is about the primary key. A primary key is a way to find the rows in your database easier – in this case we have a primary key already, so click on **Choose my own primary key** and make sure that # is selected. Click on **Next**. Finally, enter the name of the table, Panels, and click **Finish** and then **Close**.

Take a look at the table. It contains all the panels for each speaker. Let’s start by connecting the two tables. As usual we do this in queries. So, to the CREATE tab and **Query Design**. This time we need two tables. Start with **Speakers** and click **Add**. Then click on **Panels** and click **Add** and the **Close**.

We need to start by connecting the two tables to each other. The connection has to be done with the field that they have in common, that is the same in both tables. In this case the name of the speaker. So use your mouse and click on the Name in Speakers. Hold down your mouse button and pull the ***Name*** over to the other ***Name*** in **Panels**. You see a line between the two tables. Double click on the ***Name***, ***Workplace*** and ***Title*** in the **Speakers** table and the ***Day*** and the ***Item*** in the **Panels** table. Sort **Ascending** on ***Name***. Run your query. Save and close the query

As you can see the data in the Speakers table is duplicated for each time a person is speaking on a panel. And you get data about who they are and what they do. Now try to figure out how to calculate who’s doing the most panels at the conference. Start by doing the exact same thing, add both tables and create a connection between them. Double click on ***Name***, ***Workplace*** and ***Title*** in the **Speakers** table and the ***Item*** in the **Panels** table. Remember how we count – you have to add the extra row in the grid by clicking on the big sigma sign (Σ) that says **Totals.** Change the Group by under Item to Count and sort the query descending by count of Item. Run the query.

**Crosstabs**

Cross-tabs is the pivot tables of Access. This is where you can count or sum by two variables at the same time. Start by creating a new query and chose the **Panels** table for this. Double click on ***Name***, ***Day*** and ***Item*** to put them on the grid. Then look at the DESIGN tab. You see that **Select** is selected (!) which means that the queries we’ve done up until now are Select-queries. There are several other types of queries – for example queries that change the database, like **Update** or **Delete**. We’re going to use a **Crosstab**-query. So click on **Crosstab** and take a look at the grid. You see that the **Totals** row has jumped in there and also a new row called **Crosstab**. Click in the empty crosstab square under ***Name***. Choose **Row Heading**. Then click in the next square and choose **Column heading**. In the last square, under ***Item***, choose **Value**. We need to do one more thing – in the **Totals** row we have to change the **Group by** under ***Item*** to **Count**. That means, that for each name and day we’re going to count the number of panels. Run the query. Save the query and close.

One thing that is a little disturbing is that the days come in the wrong order. It’s because Access do the crosstabs in alphabetical order and that is not possible to change. So, how can we fix this?

**Changing data**

Start a new query. Choose the **Panels** table and add the ***Day*** field to the grid. Pay attention now, because it’s easy to make a mistake here – and there is no going back. So, be careful.

Start by writing ***Thursday*** in the **Criteria** row. That means that we will only select the panels that take place in the Thursday. Then look at the DESIGN tab and click on **Update**. You get another row in the grid. It says **Update to:** In that row write “***1. Thursday***”. Then click on the exclamation mark to run the query. Access come back with a message saying that we’re about to update 139 rows. Click **Yes**.

Continue changing the data by writing ***Friday*** in the **Criteria** row and “***2. Friday***” in the **Update to:** row. Run the query. And then go on with Saturday (3. Saturday) and Sunday (4. Sunday). Be very careful and pay attention so that you change both places before you run the query. Now go back to the crosstab query. Double click on the query and look at the changed result.

**Deleting data**

As you can see there is only one panel with one speaker on Sunday. In order to practice removing data we’ll remove that panel. It’s a very interesting panel – this is just to practice removing in Access.

Start a new Query and choose the table **Panels**. I always start with a Select query when I remove something – just to make sure that I remove the correct thing. So double click on ***Day***, ***Item*** and ***Speaker*** and write ***4. Sunday*** in the **Criteria** row in the Grid under **Day**. Run your query. Check so that it only displays one row. Then go back to query design by clicking on the button in the top left corner.

Look at the DESIGN tab and click on **Delete**. Nothing gets deleted until you run the query. Run the query and answer **Yes** when asked if you want to delete 1 row. You’ve now successfully deleted the panel on Sunday.

Just as with Update you should be very careful when removing data. Always do a Select-query first to make sure that you’ve selected the correct rows. And keep a backup of the data that you uploaded so that you can restore the data if you happen to remove or change too much.