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Database Tutorial

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Database Tutorial



This database tutorial is aimed at beginners. Perhaps, you think you need a database but you're not sure. Or maybe you need to create a database driven website but don't know where to start? Or perhaps you already work with databases but you'd like to brush up on the fundamentals?

If this sounds like you, read on!

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If you are already familiar with databases but would like to learn SQL, check out the [SQL Tutorial](#). If you'd like to learn how to use Microsoft Access, try the [Microsoft Access Tutorial](#).

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What is a Database?


A database is a collection of data. That may sound overly simplistic but it pretty much sums up what any database is.

A database could be as simple as a text file with a list of names. Or it could be as complex as a large, relational database management system, complete with in-built tools to help you maintain the data.

Before we get into dedicated database management systems, let's start with the basics - let's look at a simple text file example.

Text File

Imagine we have a **text file** called "**Individual.txt**", and that the contents look like this:



```

File Edit Format View Help
IndividualId,FirstName,EmailAddress
1,Homer,homer@quackit.com
2,Barney,barney@quackit.com
3,Ozzy,ozzy@quackit.com
4,Fred,fred@quackit.com
  
```

We could use this information to do things such as send an email to everyone on our list. We could do this because, due to the way we designed the list, we know that each *row* contains a different individual, and the information on that row is related to that individual. Also, the items in each row are separated by commas. Therefore, we know that the email address next to "Homer" is his email address. We could also call each row a *record*. Therefore, we currently have 4 records in our database.

With a small list like this, a text file may serve our purposes perfectly.

Spreadsheet

Another option would be to store it in a spreadsheet using spreadsheet software (for example, Microsoft Excel). That way, we could do some extra things with our list (such as format it, or sort by first name/surname etc).

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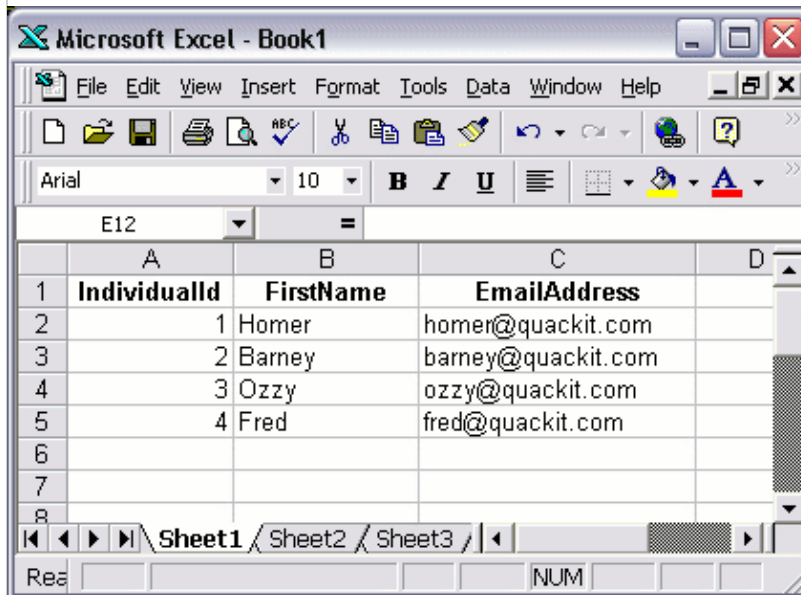
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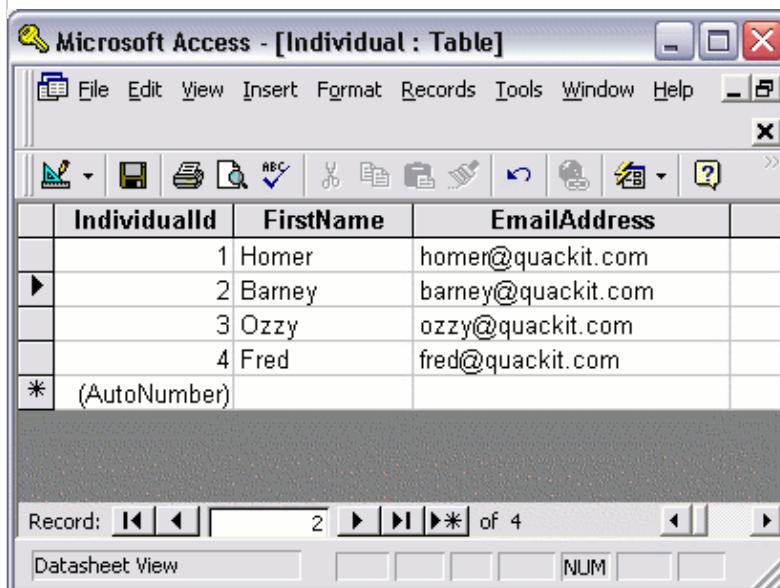
A spreadsheet program like Excel makes these tasks relatively easy to do. Also, programs like Excel organize the data into *rows* and *columns*, making your data easier to comprehend. Something like this:



	A	B	C	D
1	IndividualId	FirstName	EmailAddress	
2	1	Homer	homer@quackit.com	
3	2	Barney	barney@quackit.com	
4	3	Ozzy	ozzy@quackit.com	
5	4	Fred	fred@quackit.com	
6				
7				
8				

Database Software

A better option would be to **store the data in a database table** using specialized database software, such as Microsoft Access. Something like this:



	IndividualId	FirstName	EmailAddress	
	1	Homer	homer@quackit.com	
▶	2	Barney	barney@quackit.com	
	3	Ozzy	ozzy@quackit.com	
	4	Fred	fred@quackit.com	
*	(AutoNumber)			

Record: 2 of 4

So What's the Difference?

You may be wondering what the difference is between the last two examples (Excel vs Access). After all, both examples have the data organized into rows and columns.

There are many differences between spreadsheet software and database software. The rest of this tutorial will show you why database software is a much better option for creating databases.

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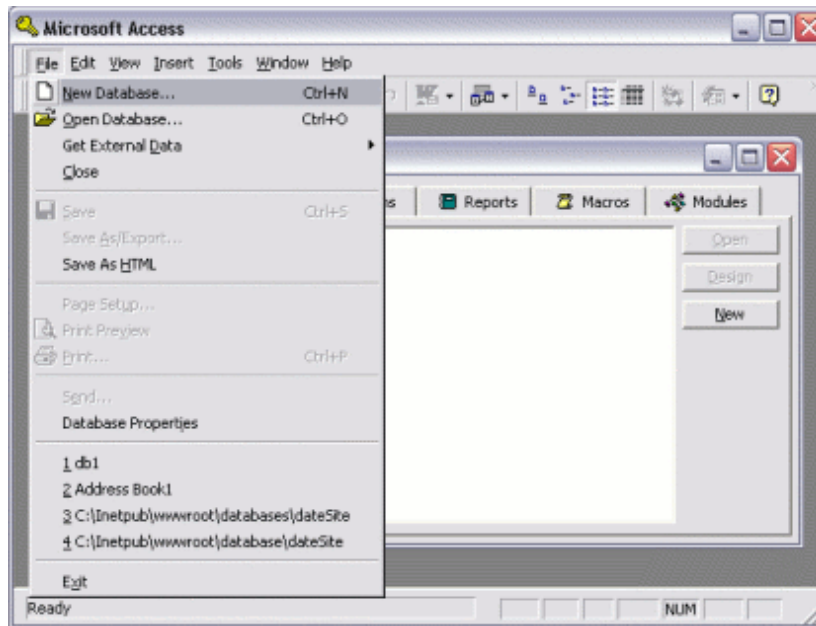
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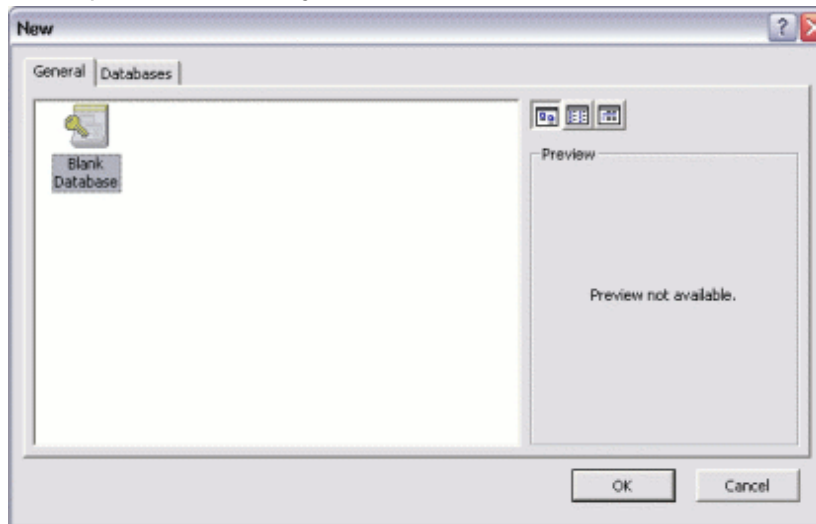
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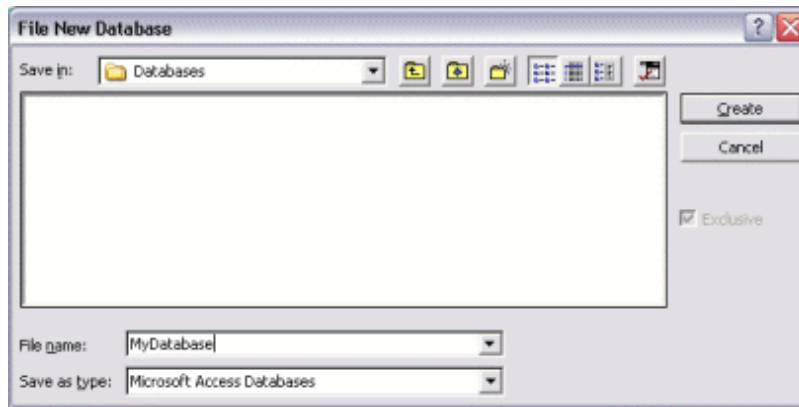




2. Choose "Blank Database". (MS Access also gives you the ability to choose from a template, but we'll just use a blank database here):

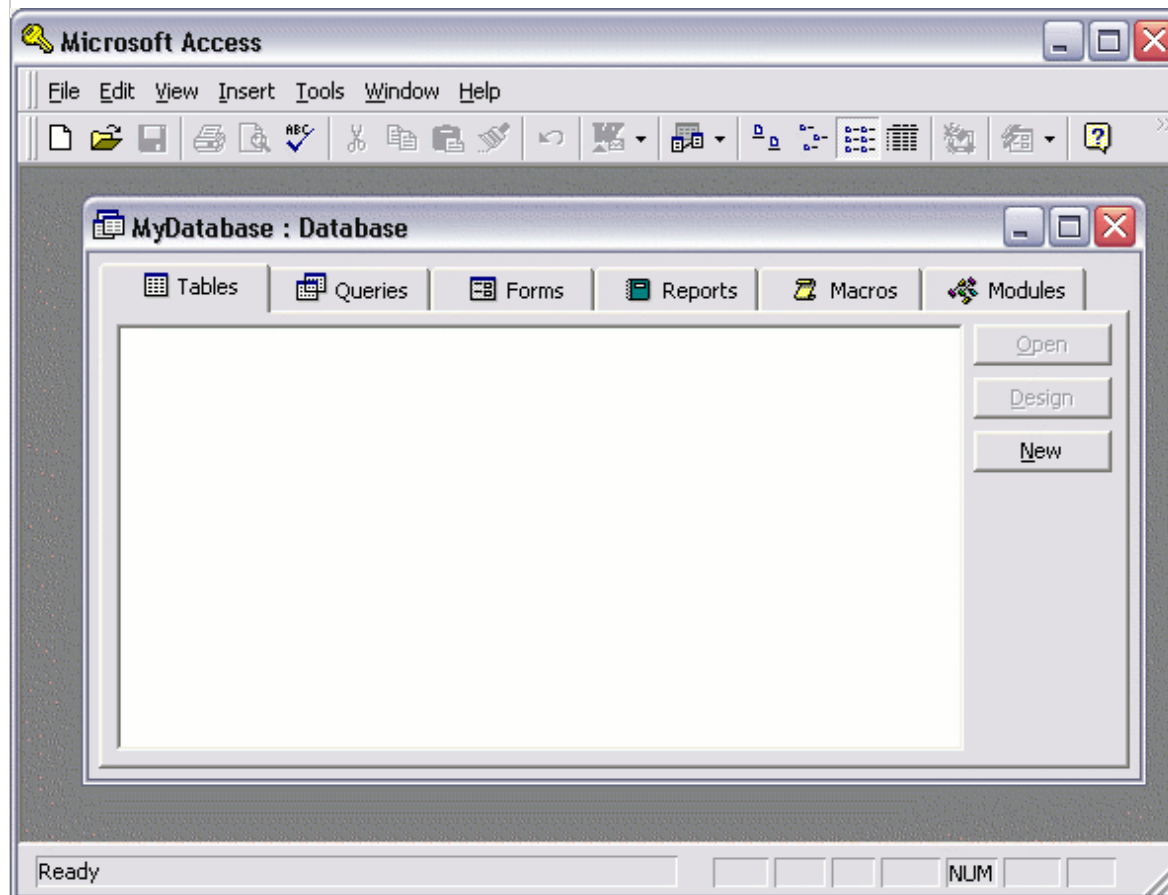


3. Choose a location to save the database:



Your New Database

Once you've completed the above tasks, you should see a blank database, like this:



We know this database is blank because it doesn't have any tables. If it did, you would see these tables in the middle pane of the table tab. Now that we have our blank database, we can start adding some tables.

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IndividualId	FirstName	EmailAddress
1	Homer	homer@quackit.com
2	Barney	barney@quackit.com
3	Ozzy	ozzy@quackit.com
4	Fred	fred@quackit.com

Record: 1 of 4

Datasheet View

A row contains each record in the table, and the column is responsible for defining the type of data that goes into each cell. Therefore, if we need to add a new person to our table, we would create a new row with the person's details.

OK, now lets go ahead and [create a table](#).

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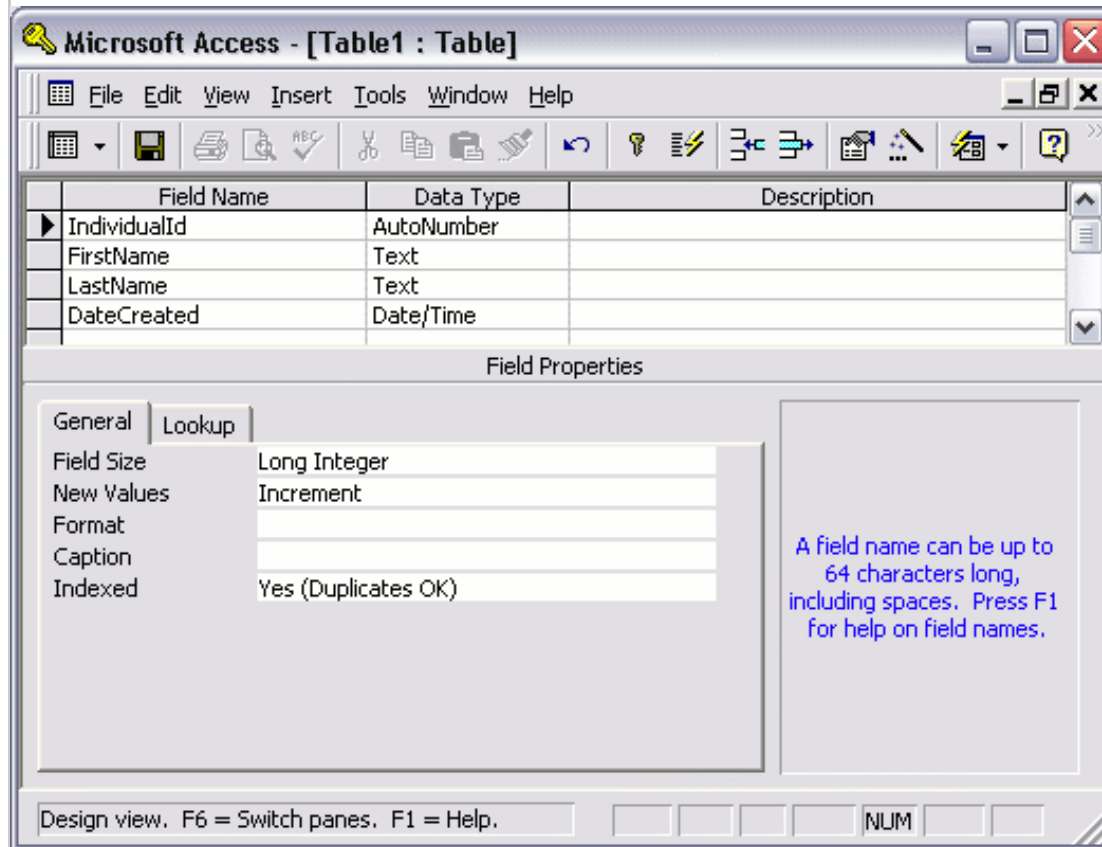


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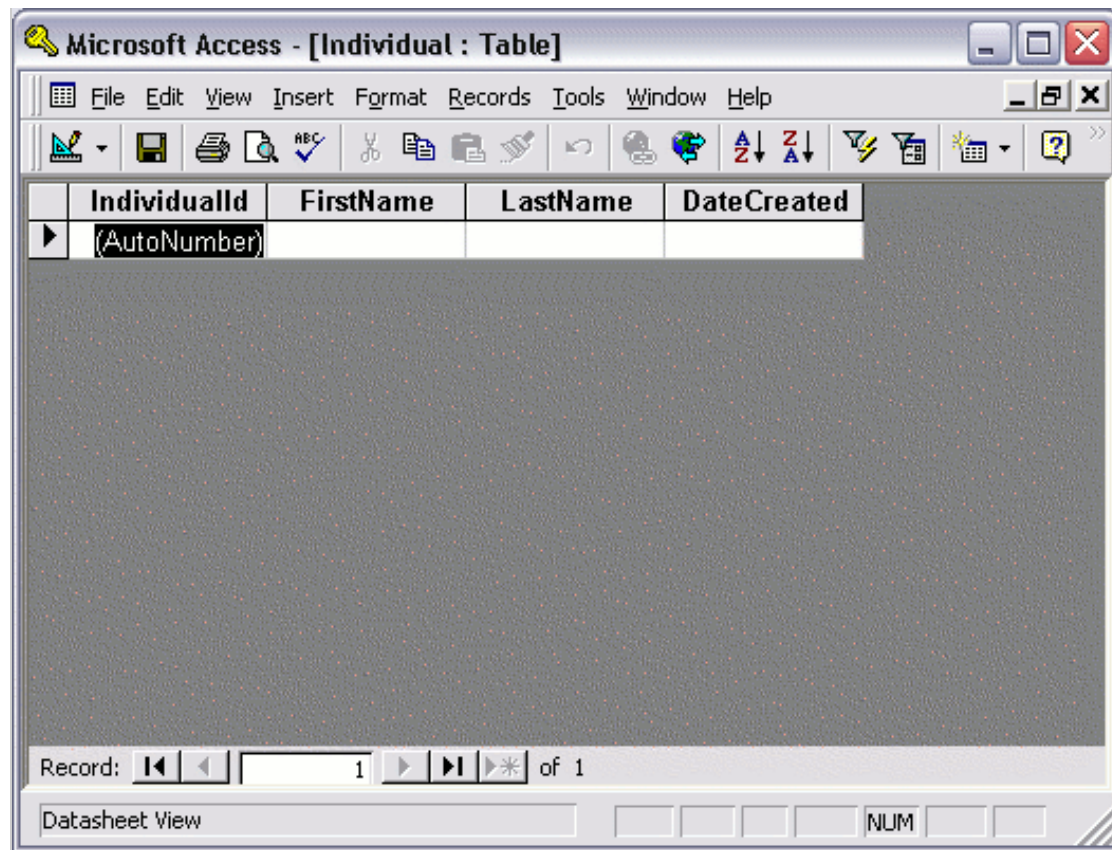
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For example, you could specify a default value to be used (in case the field has been left blank by the user).

When you create a table via the user interface (or design view), depending on which database system you use, you should see something like this:



Once you've created your table in "design view", you can switch to "datasheet view" to see the resulting table. You should see something like this:



OK, so this is a blank table - it doesn't have any data yet. What we have is a table that contains the columns required before we can enter any data.

So, now that we have a blank table, let's look at how to add data.

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Adding Data to a Database

There are a number of ways you can enter data into a database table. The method you choose will largely depend on your context.

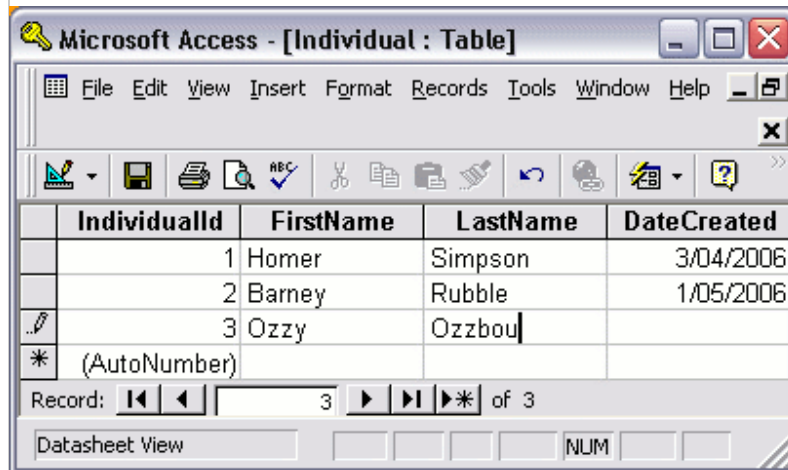
You will need to choose from the following methods:

- Direct entry
- Form
- Structured Query Language (SQL)
- Website or other application

Here's an explanation of those methods.

Direct entry

You can type directly into the table while it's in Data Sheet view. Initially, this may seem like the quickest and easiest method, but it's not suitable if you have lots of data, and/or if non-technical users need to enter data.



Form

If you use a desktop database program (such as MS Access), you can set up a form, so that non-technical users can enter data into the



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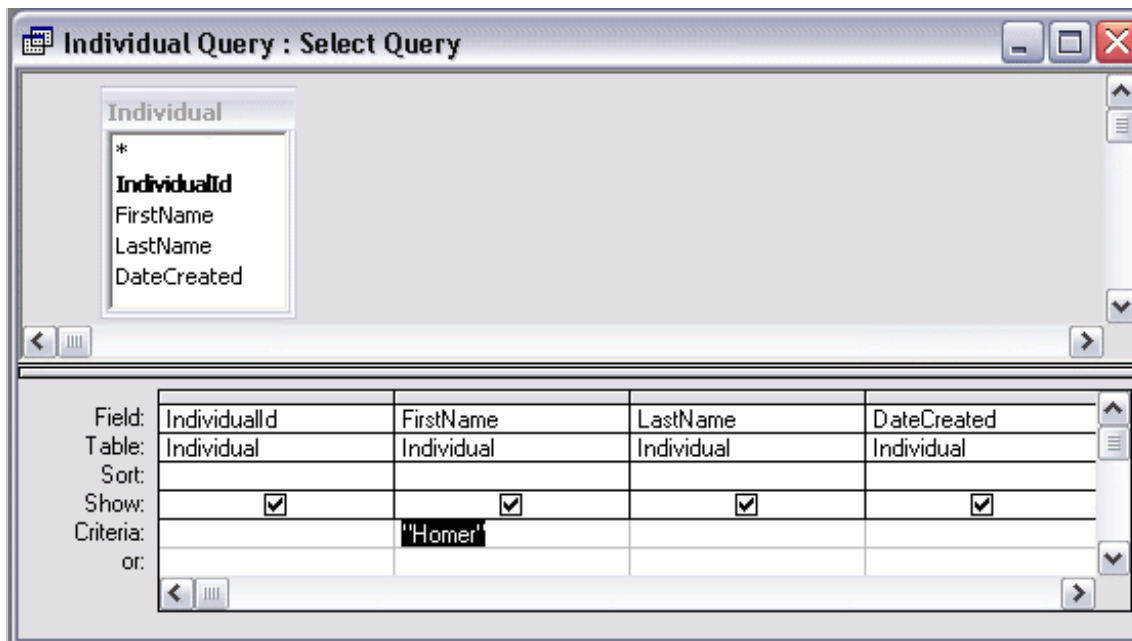
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When using design view, the database system actually uses SQL (behind the scenes) to generate the query.

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Users can register their details, then add content. When the user clicks the "Submit" button, their details/content is inserted into the database. Then when someone decides to view this content, it is read from the database using SQL (Structured Query Language).

Combination of Static and Dynamic

Some websites have a combination of static content and dynamic content. There could be any number of reasons for this. Often, smaller websites will be static. There's little need to configure a database just to store a handful of webpages - much easier and cheaper to keep them as files on the server. Even websites like this might contain some added functionality such as a discussion forum, or a blog. In this case, the discussion forum or blog will need its content stored in a database.

Benefits of a Database Driven Website

Database driven websites can provide much more functionality than a static site can.

Extended functionality could include:

- Enabling many (potentially non-technical) users to provide content for the website. Users can publish articles on the website without needing to FTP them to a web server.
- Shopping cart
- You can provide advanced search functionality that enables users to filter the results based on a given field. They can then sort those results by a field - say "Price" or "Date".
- Customized homepage
- You can allow your users to perform tasks such as registering for a newsletter, post questions to your forums, provide comments on a blog, update their profile,

- [Querying a database using ColdFusion](#)
- [Querying a database using PHP](#)

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Database Summary



So, you've made it to the last page of this database tutorial... Well done!

You should now have a general understanding about databases and how they're used. This tutorial was intended for beginners trying to gain an understanding of databases. Databases are not like most other files and require a little bit of thought in order for you to understand the concept.

If you have your own database management system installed, you should have a better understanding of where to start and what the various options mean.

What Next?

Most of the examples in this tutorial used Microsoft Access. If you'd like to learn how to use Microsoft Access, try the [Microsoft Access Tutorial](#).

Also, you'll have noticed SQL coming up throughout this tutorial. SQL is a very powerful language, but is also very easy to learn. You can achieve a lot even by learning just a little SQL. If you're interested in learning more about SQL, check out the [SQL tutorial](#). Once you complete this tutorial, you will be able to do things such as:

- Select only the columns you want from a query
- Query multiple tables
- Create databases programatically
- Create tables programatically
- Query multiple tables

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