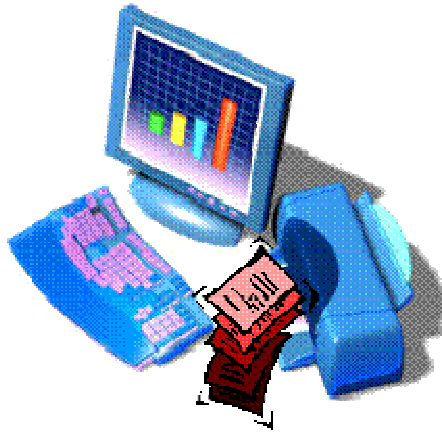


Using Access 2003

UK
UNIVERSITY
OF KENTUCKY
Human Resource
Development



Participant Guide

University Of Kentucky
HRT&D Technology Training
111 McVey Hall
(859) 257-2900

Copyright 2005

For technical assistance, please call 257-1300

Using Access 2003

Objectives

This class is designed for students who want to learn to open existing databases, understand how tables are created, edit and customize existing tables, enter data into a table or form, and create queries to extract information from multiple tables.

Prerequisites:

A working knowledge of Excel is not mandatory, but is extremely helpful for understanding databases.

After completing this course, you will:

- Be able to open an existing database
- Be able to identify the parts of the Access database window
- Understand the benefits of using Access
- Understand a basic relational database structure
- Understand how tables are created and related
- Be able to enter data into a table or form
- Be able to create and run a query

Using Access 2003

Table of Contents

Introducing Access	1
Starting Access and Opening a Database	1
Access versus Excel	1
Closing a Database and Exiting Access	1
Understanding the Database Window	2
Database Objects	2
Tables	4
Viewing Tables	4
Datasheet View	4
Design View	4
Creating a Table	5
Related Tables – The Real Power of Access	7
Viewing/Entering Data	9
Entering Data into a Table	9
Entering Data into a Form	10
Queries	11
Viewing (Running) Queries:	11
Datasheet View	11
Design View	11
Creating Queries	12
Appendix	15
When to use Access	15
When to use Excel	15
Answer Key	16


Introducing Access

Access is a relational database management system (RDMS). A database is an organized collection of information. A **relational** database allows you to store data in multiple tables that are related to each other. This allows you to organize, retrieve, and analyze important information quickly and efficiently.

Starting Access and Opening a Database

To open Access, click on the **Access** icon on your desktop or Start Menu (**Start** → **Programs** → **Microsoft Office** → **Access**).



To open a specific database, click on the **File** menu → **Open** and navigate to the location where the database is stored. (A shortcut to this is to click on the open folder icon  in the Standard toolbar). Access files have an extension of .mdb.

**An alternate way of opening an existing database is to navigate directly to the database (using My Computer or Windows Explorer) and double-click on the name of the file. Access will automatically start up and open up to that file.*

Access versus Excel

Access and Excel can both be used to store information in a database-like format. They both organize data in columns, (Access actually calls these **fields**), and rows (which Access calls **records**).

So when should you use Access and when should you use Excel?

Although you can store lists of information, such as a personnel directory (containing name, phone, and address information) in Excel, Excel's real power is its ability to calculate data and perform complex operations, and should be reserved for such projects.

In comparison, Access's real talent is to store and process *a lot* of data and allow you to organize, manipulate, and analyze that data through complex querying.

Many times people will begin using Excel to store their information but because of the quantity of data or the complex querying and reports that they want, they will quickly realize that Access is a better choice. It is usually possible to convert an existing Excel worksheet into (the start of) an Access database through a process called **normalization**.

For more information on when to use Access and when to use Excel, please see the Appendix.

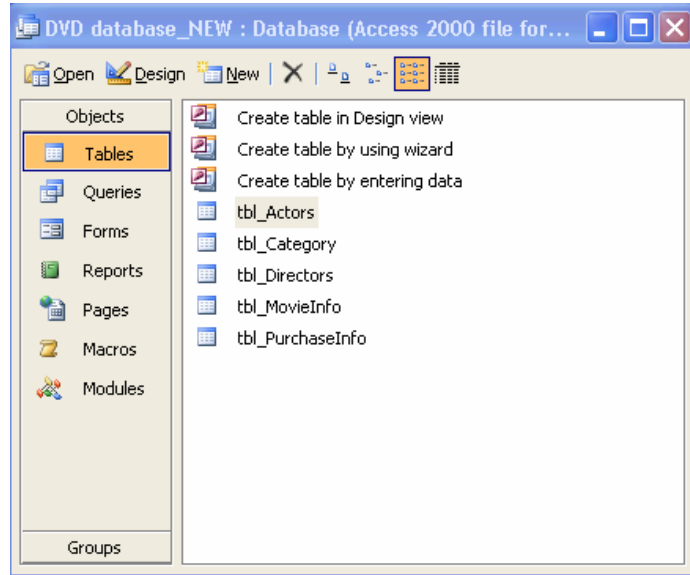
Closing a Database and Exiting Access

When you open a database file in Access, it will appear in a separate window (called the Database Window). You can close the individual file and leave Access open or you can choose to close both Access and the file.

Each Access file is made up of many objects. When you open an object, such as a table, it will also appear in its own separate window, giving you three open windows (see Figure below). Each window has its own "close" button.

Understanding the Database Window

When you open a database file in Access, it is displayed in the Database Window. The Database Window contains all of the objects that make up the individual Access file.



Database Objects

There are a total of seven database **object types** that can be included in every Access file: **Tables, Queries, Forms, Reports, Macros, Modules, and Pages**. The only object that **must** be present in every database is the table.


Main objects:

- Tables – contain the data
- Queries – filter the data so that you can view only selected records that meet a criteria from one or more table
- Forms – user-friendly format to enter and view data
- Reports – display data in a presentation-quality document (Examples of reports are sales summaries, phone lists, and mailing labels.)

Advanced objects:

- Pages - Web pages, published from Access, that have a connection to a database
- Macro – automate Access procedures using pre-defined actions
- Modules – contain special programming that perform Access functions

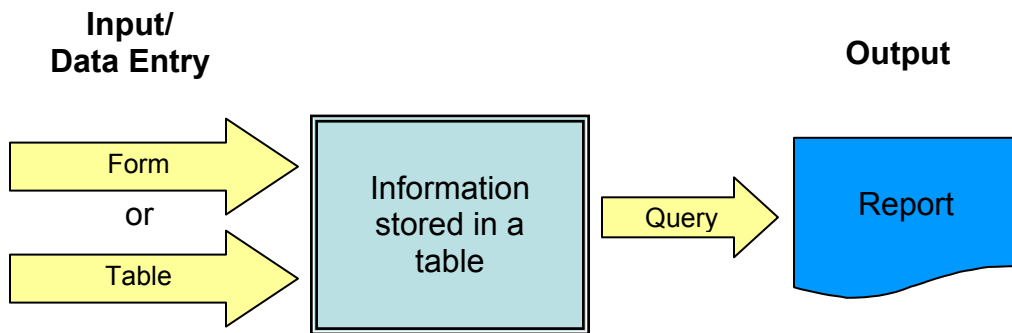
To view a database object, simply click on the database object type in the left-hand side of the Database Window. Once all of the objects of that type appear in the window, double-click on the one you want to open.



EXERCISE #1: Opening/ Viewing Objects

1. Click on the query object
2. Open the query labeled "qry_Directors"
3. Close "qry_Directors" but leave the database open.

A typical example of how the information flows in a database is illustrated below. Information is entered into the database through a form or directly into the table. The information is then stored in a table. You run a query to select specific records that meet a criteria and then print it out in a report.



When you open different queries and tables, you will notice that the database file will remain open as well as the table. If you click on the close button at the very top, you will have closed the whole Access database file.

ActorID	LastName	FirstName
1	Andrews	Julie
2	Chrystal	Billy
3	Clooney	George
4	Costner	Kevin
5	Crowe	Russell
6	Damon	Matt
7	DiCaprio	Leonardo
8	Ford	Harrison

This button will close Access and anything currently open in Access.

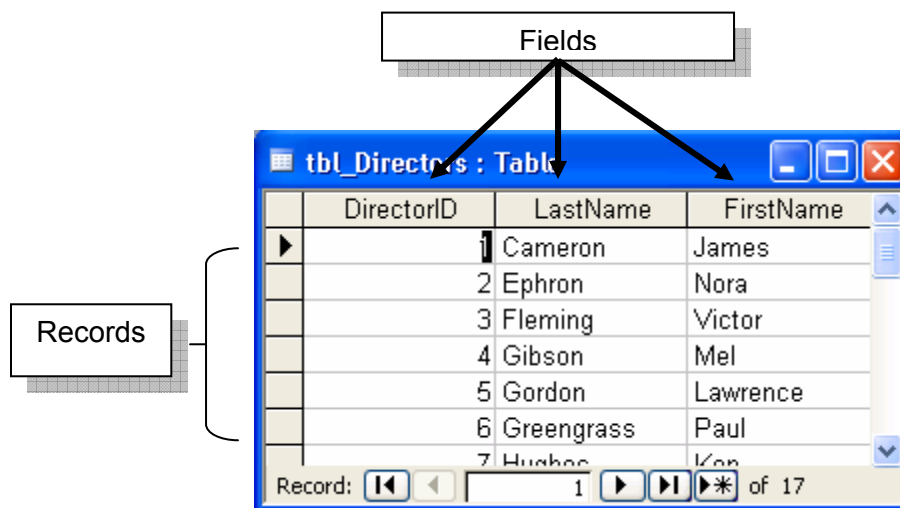
This button will close the database called "DVD database_NEW" and any open objects.

This button will close the table called "tbl_Actors."

Tables

A table is a collection of data about a specific topic. Tables are the building blocks of databases because they contain all of the information that you will want to filter, query, analyze, display, and print. Because of this, all of the other database objects are dependent upon the design of and information contained in the table. For example, queries extract information from one or more tables. Forms enter information into one or more table, and reports display the information from tables or queries.

Tables contain data organized in records (similar to rows in Excel). Each piece of information in a record is a field (similar to a column in Excel). Using a separate table for each topic means that you store that data only once. This results in a more efficient database and fewer data-entry errors (See figure below).



Viewing Tables

Access provides two ways to view tables: datasheet view and design view.

Datasheet View displays the data stored in a table in a spreadsheet-like format. In Datasheet View, you can add, delete, and search for data.

Design View allows you to create or edit the design of a table. Note: tables, queries, forms, and reports can all be viewed in design view.

Design View, in essence, is where you *design* the table, while Datasheet View is where you view and enter the data.

DirectorID	LastName	FirstName
1	Cameron	James
2	Ephron	Nora
3	Fleming	Victor
4	Gibson	Mel
5	Gordon	Lawrence
6	Greengrass	Paul
7	Hughes	Ken

Datasheet View

Field Name	Data Type	Description
DirectorID	AutoNumber	
LastName	Text	
FirstName	Text	

Field Properties

General Lookup

Field Size: Long Integer
 New Values: Increment
 Format:
 Caption:
 Indexed: Yes (No Duplicates)
 Smart Tags:

Design View

Creating a Table

**NOTE: This section is intended to give you an understanding of how information is organized in tables and how those tables related to each other. If you are responsible for using and maintaining a database (and not actually creating one), chances are the tables that are essential to the database have already been created. You will simply need to know which tables contain which pieces of information and how they relate so that you can enter and retrieve information.*

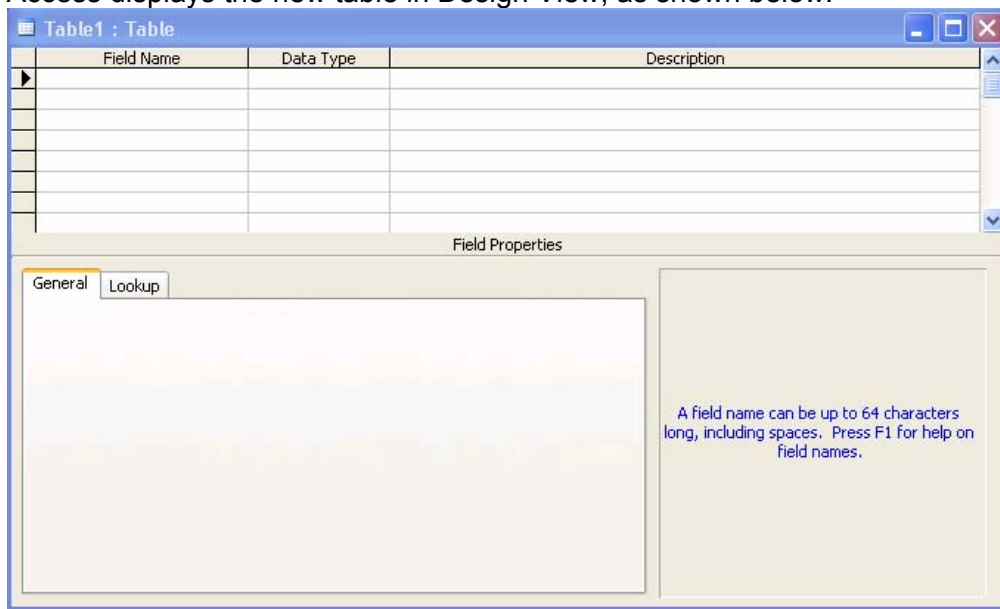
Before actually creating a table in Access, it is important to decide how to categorize the information into tables, determine which fields of information to include in each table and decide how the tables will relate to each other. A well-designed database can be extremely useful in gathering and analyzing data quickly, but a poorly designed database will only make more work and ultimately lead to a need to start from scratch.

When you create your table in design view, you will enter the following:

- Enter field names
- Specify the field's data type (This determines the type of data that will be allowed to be entered into that field. For example, you can restrict a "Date of Birth" field to only allow dates to be entered. This is one level of protection to ensure the stability of the database.)
- Description of the field
- Enter the field's properties (for example, field size, default value, etc.) This is another way of ensuring that you get "good data" in your database.

To create a table:

1. Click on Tables on the left side of the Database Window, if it is not already selected
2. Double-click on **Create table in Design view**
3. Access displays the new table in Design View, as shown below:




New query in design view


4. Type the name you want to give the first field in the **Field Name** column and press the **Tab** key or **Enter** key.

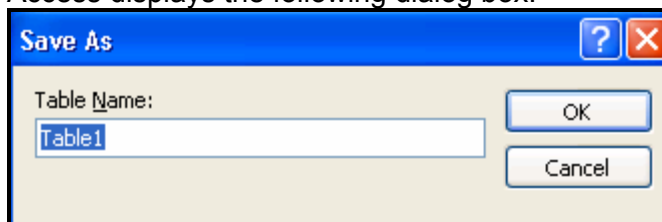
5. Select the **Data Type** and hit **Tab**. A description of the 10 data types is in the table below:

Data Type	Description
Text	Text or text-and-number combinations, like addresses. Text fields can contain up to 255 characters.
Memo	Text or text-and-number combinations of up to 64,000 characters.
Number	The number characters 0-9. This data type should be used when you want to perform simple calculations on the data contained in this field.
Date/Time	Date and time values
Currency	Data used for calculating currency values. Access does not round off currency data types.
AutoNumber	Provides a unique sequential value for new records that are typically incremented by 1.
Yes/No	Limits the input in a field to one of two values, 0 or -1. You can represent these values as Yes or No , True or False , or On or Off . You can also have Access display these values as text or as a check box (the default).
OLE Object	Contains an object that supports Microsoft OLE (object linking and embedding).
Hyperlink	Text to be used as a hyperlink, which is a link to another document, website, or email address.
Lookup Wizard	Initiates a Wizard that helps you to create a lookup field. The lookup field presents the user with a list of values from which he or she can select.

6. Enter a description for the field (optional).
 7. Repeat steps 4 through 6 to enter all of the fields.
 8. Identify the **primary key** by clicking anywhere in the field and clicking on the **Primary Key** button .

*The power of a relational database system such as Microsoft Access comes from its ability to quickly find and bring together information stored in separate tables using queries, forms, and reports. In order to do this, each table should include a field or set of fields that uniquely identifies each record stored in the table. This information is called the **primary** key of the table. Once you designate a primary key for a table, Access will prevent any duplicate or Null (missing or unknown data) values from being entered in the primary key fields, ensuring the stability of the database.*

9. Click on the Save button .
 Access displays the following dialog box:



10. Type the name you want to give the table in the **Table Name** box and click **OK**.

It is a good idea to name all objects in your database consistently by assigning some sort of **naming convention. The most common naming convention includes adding a “tag” at the beginning of the name of the object, indicating what type of object it is, followed by an underscore (_), as in the chart below. You should also be consistent as to whether or not you use spaces or other punctuation in the names of your objects.*

Table	tbl	Macro	mcr
Query	qry	Module	mdl
Form	frm	Database	Dbf
Report	rpt	Pages	pg

Sample Database Naming Convention



EXERCISE #2: Creating a table

Create a table in design view to store information about your DVD collection. Include the following fields:

Field Name	Data Type	Description	Field Size
Category ID	Autonumber	DVD Category unique ID number	
Category Description	Text	DVD category	50

1. Set the Category ID field as the primary key.
2. Save the table as “tbl_Category”

Related Tables – The Real Power of Access

The real power of Access is the ability to store information in multiple tables that are related to each other. This is what allows you to enter the information one time, cutting down on the risk of data entry errors. This is what makes the planning part of creating a database so crucial to the process. In order for two tables to relate to each other, they must contain matching fields. The linking of these matching fields is what results in a *relational database*.

All tables should be designed with a primary key (as you learned about in step #8 in “Creating Tables”.) The **primary key** is the one field that identifies the entire record. (For example, in a personnel directory, employee ID or SS# identifies that person and everything associated with that person’s record.)

In order for the tables to relate, the primary key in one table must be used in the related table (and must be the same data type). When the field is repeated in this way, Access automatically interprets the field in the second table as a **foreign key**.

You will learn more about how tables relate to each other in the Queries section. For now, take a look at the below tables stored in an Access database and answer the related questions.



EXERCISE #3: Related Tables

Answer the following questions, referencing the tables below (**tbl_Category** and **tbl_MovieInfo**):

1. What type of movie is Good Will Hunting? _____
2. What type of movie is "The Sting" _____
3. What type of movie is "Chitty Chitty Bang Bang"? _____
4. How many movies are considered Romance? _____ Which one(s) are they? _____

CategoryID	Category Descripti
1	Action
2	Drama
3	Epic
4	Fantasy
5	Musical
6	Romance
7	Thriller

Record: 1

DV#	DVD_Title	CategoryID
1	Bourne Supremacy	1
2	Braveheart	3
3	Chitty Chitty Bang Bang	5
4	Field of Dreams	2
5	Forrest Gump	2
6	Gladiator	3
7	Gone with the Wind	2
8	Good Will Hunting	2
9	Indiana Jones and the Temple of Doom	1
10	Lord of the Rings-Return of the King	4
11	Oceans 11	1
12	Sleepless in Seattle	6
13	Sound of Music	5
14	Star Wars - Attack of the Clones	4
15	The Sting	7
16	Titanic	6
17	When Harry Met Sally	6
*	ber)	0

Record: 1 of 17

Viewing/Entering Data

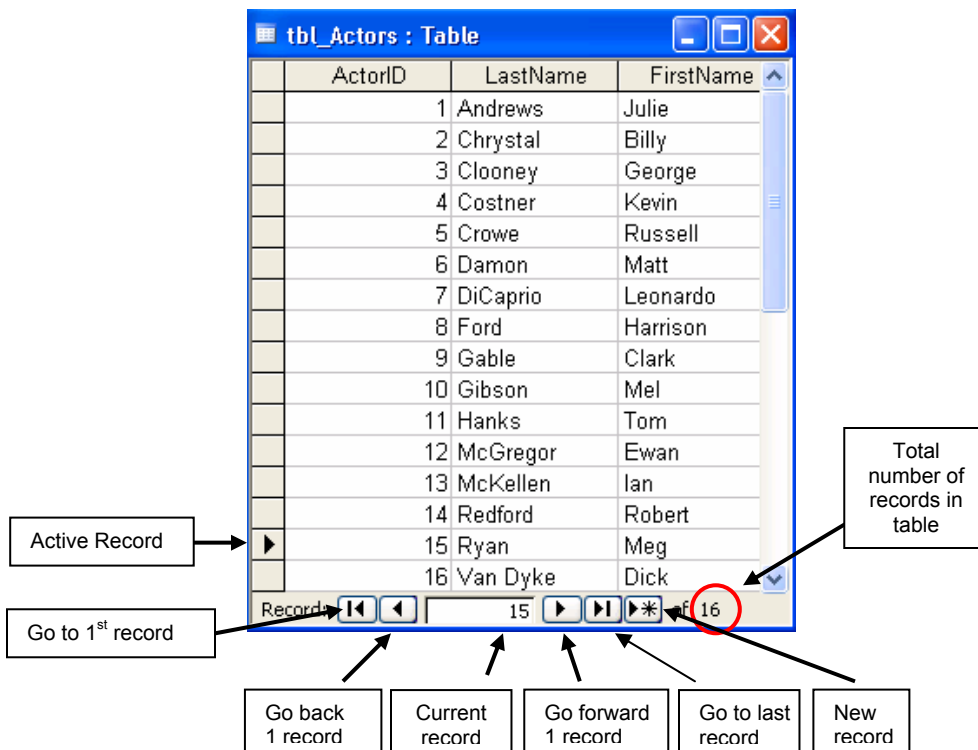
Once a table is created, you can add records to it. You can also view and edit existing records.

There are two ways to enter/edit records into a table: you can enter the information directly into the table in Datasheet View or you can enter the information into a user-friendly form.


Entering Data into a Table

To enter data in a table, use the following steps:

1. Be sure that **"Tables"** is selected in the Database Window and double-click on the table you want to open.
Access opens the table in Datasheet view.
2. To add records to a table that already contains data, click on the **New Record** button (▶*) or click on the first field (column) in the first empty record (row).
3. Enter the data in the first column and press the **Tab** key.
*If the first field is an **AutoNumber**, Access will automatically enter a value in this field. You cannot enter or edit this number. Simply press the **Tab** key to move to the next field.
4. Continue to enter data in each field, pressing **Tab** to move between fields.



Tips for entering data into an Access table:

- * Access displays a pointer () to the left of the record that you are currently working on.
- * Press the **Esc** key to undo the data you have entered in the *current* (active) field.
- * To save a record and continue entering more records: Press the **Tab** key or the **Enter** key
- * If you are done entering data and just want to save the record: Press the **Shift/Enter** keys
- * Access automatically saves the record as soon as you move the insertion point to a different record or exit the database.



EXERCISE #4: Entering/Editing Information into a Table

1. Enter the following information into the tbl_Category table that you created in exercise #2:

Category ID	Category Description
1	Action
2	Drama
3	Epic
4	Fantasy
5	Musical
6	Romance
7	Thriller

Entering Data into a Form

Many database developers prefer to use forms for data entry because they are easier to use, present only the necessary choices, and can provide helpful text for the people entering the data. Because they can be so creative and flexible, every form can be unique. You will need to follow the instructions given on the form to enter and edit the data. (If you have ever made a purchase or signed up for a mailing list on the Internet, you have probably filled out a form that “fed” your information into one or more tables in a database.)

Queries

One of the main reasons for storing data in a database is the ease with which you can retrieve that information from the database. This is done with queries. A **query** is a question you ask the database about the data stored in your tables, or a request to perform an action on the data. A query can bring together data from multiple tables to serve as the source of data for a form, report, or data access page.

Queries can be used to:

- sort records
- select records that meet specific conditions
- exclude fields from display
- calculate values in records
- display information from multiple tables (these tables must be related, or joined)

The most common type of query is called a select query, because it selects certain records that meet a criteria.

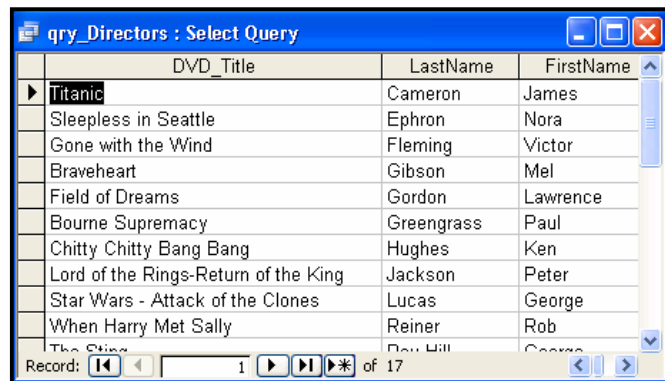
Viewing (Running) Queries:

When you double-click on a query in the Database Window, you are not only opening the query; you are essentially “running” the query. This means that every time you double-click on the query, Access goes to the table(s) and gathers the most current information that meets the criteria specified in the query. This process is considered more than just opening an object, because each time the query runs, you are getting the most recent information.

(For example, you can create a query today that asks for all of the DVDs that are in the “Action” category, enter more records tomorrow that include some action DVDs and then re-run the query. When you re-run the query, your new records will automatically be included in the query results.)

Datasheet View displays the query results in a spreadsheet-like format. This format will look identical to the Datasheet View of a table. The difference, however, is that you have specified which fields to show (or not to show), you are seeing only records that meet the specified criteria, and you may be displaying data from multiple tables.

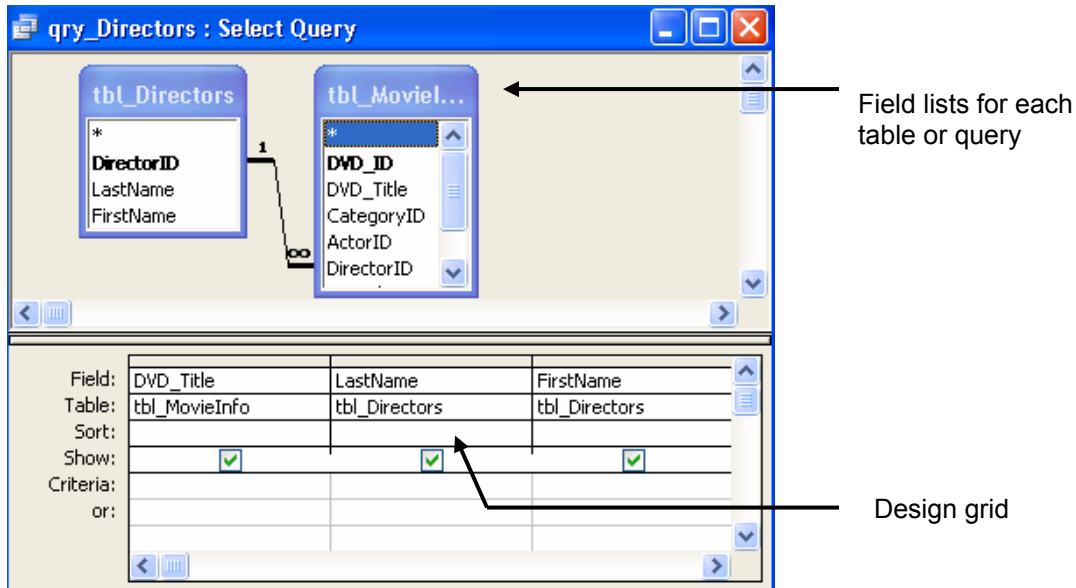
Design View is where you create the query. It allows you to specify which table(s) to include, what field(s) to include, what criteria to look for and perform calculations.



DVD_Title	LastName	FirstName
Titanic	Cameron	James
Sleepless in Seattle	Ephron	Nora
Gone with the Wind	Fleming	Victor
Braveheart	Gibson	Mel
Field of Dreams	Gordon	Lawrence
Bourne Supremacy	Greengrass	Paul
Chitty Chitty Bang Bang	Hughes	Ken
Lord of the Rings-Return of the King	Jackson	Peter
Star Wars - Attack of the Clones	Lucas	George
When Harry Met Sally	Reiner	Rob
The Sting	Warren	George

Query – Datasheet View

In order to include multiple tables in a query, you must create a join between the matching fields (primary key & foreign key). These fields that you join must have the same data type (for a review of data types, please see page 9). Many database developers will create these joins, or relationships, between tables during the development stage. Below is an example of a query in Design View.



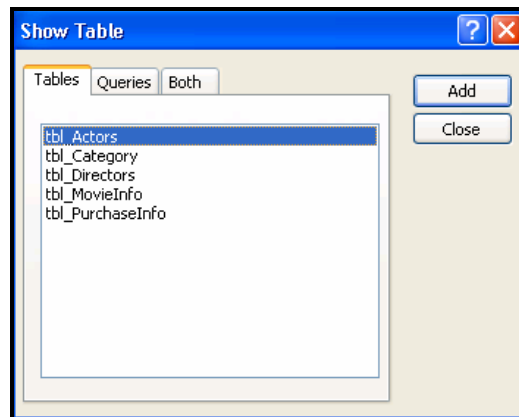
Query – Design View

Creating Queries

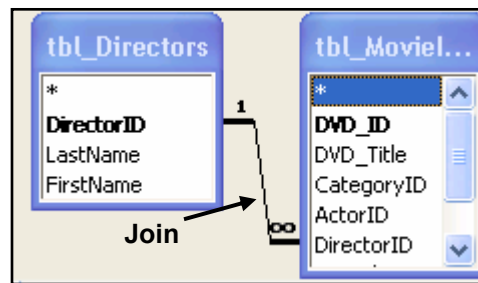
To create a query, use the following steps:

1. Be sure **queries** is selected in the Database window.
2. Double-click **Create query in Design view**.
3. Access displays the “**Show Table**” box.

Double-click the name of the table(s) you wish to include in the query. As you add each table, you will see the table displayed in the top half of the Design View screen.



4. When you have finished selecting all of the tables you wish to include, click **Close**. If the tables you included are not related but contain identical fields, create a temporary relationship by clicking on the field in the primary table and dragging it to the matching field in the second table. A join is illustrated below:

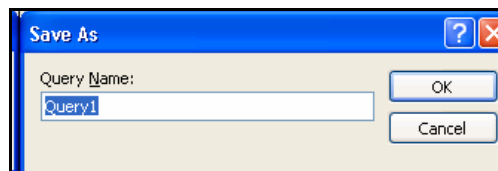




Remember:
The fields in both tables must be the same data type in order to be joined.

5. To add fields to the design grid, do one of the following:
- Click on the field in a field list and drag it to the desired location column in the design grid
 - or
 - Double-click on the field in a field list
- Access adds the selected fields to the design grid area of the window and fills in the Field and table name. A checkmark is automatically placed in the “**Show box**”, indicating that this field will be displayed in the query results. If you do not want this field to be displayed (but wish to use this field in your criteria selection), simply leave the field in the design grid of the query and remove the “Show” box checkmark.
6. Enter any criteria you want to specify in the design grid. Below is a list of comparison operators commonly used for specifying criteria.

OPERATOR	MEANING
=	Equal to
<>	Not equal to
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to

7. Save the query, by clicking on the **Save** icon . Access displays the following dialog box:



8. Type the name you want to give the query and click **OK**. (Remember to use the tag “qry_” if you are making use of naming conventions.)
9. To run the query, click on the View button  or the **Run** button .



EXERCISE #5: Creating a Query

1. Create a query that displays the name of the movie and the category in which that movie belongs. (HINT: you will be using **tbl_MovieInfo** and **tbl_Category**). If there is not already a join between these two tables, create one.
2. Display the following fields: **DVD_Title**, **Year_Released**, **Category_Description**
3. Sort the query by category description and view the results. How many records are in the query result? _____
4. Specify that you only want to see movies that were produced before 1980. How many records are in the query result? _____ Which one(s)? _____
5. Clear the criteria from #3 and #4. Specify that you only want to see movies that begin with a "B" or an "S." How many records are in the query result? _____ Which one(s)? _____
6. Clear the criteria from #5. Specify that you only want to see movies that are in the Drama category. How many records are in the query result? _____ Which one(s)? _____
7. Save the query as "**qry_DramaDVD**"

(To see the answers for this query, please refer to the Appendix).

Appendix

When to use Access

Use Access when you:

- Require a **relational** database (multiple tables) to store your data.
- May need to **add more tables** in the future to an originally flat or non-relational data set.
For example, if you want to keep track of customer information such as first and last names, addresses, and telephone numbers, but that information may grow to include actions by customers such as orders, then consider starting your data project in Access.
- Have a **very large amount of data** (thousands of entries).
For example, if you work in a large company and are required to store personnel information, then use Access.
- Have data that is mostly of the **long text string type** (not numbers or defined as numbers).
- Rely on **multiple external databases** to derive and analyze the data you need.
For example, if you need to import or export data regularly from Access databases, it may make the most sense to work in Access to maximize compatibility.
- Need to maintain **constant connectivity** to a large external database such as one built with Microsoft SQL Server.
- Want to run **complex queries**.
For example, if you work in a large company that takes customer orders, you might have to look up customer names stored in a SQL Server database while taking new customer orders in Access. You can maintain a connection to the SQL Server database from within the Table view in Access. When you add or look up a customer name, you are working against the SQL Server database, but the new order details you just took are stored locally in Access tables.
- Have **many people working** in the database and want robust options to expose that data for updating.
*For example, Access offers **data access pages** for the more technical user and **forms** if you want to be more user friendly.*

When to use Excel

Use Excel when you:

- Require a flat or **non-relational** view of your data (you do not need a relational database with multiple tables). This is especially true if that data is mostly **numeric**—for example, if you want to maintain a financial budget for a given year.
- Want to run primarily **calculations** and **statistical comparisons** on your data — for example, if you want to show a cost/benefit analysis in your company's budget.
- Know your **dataset is manageable in size** (no more than 15,000 rows).

Answer Key



EXERCISE #1: Opening/ Viewing Objects

1. Click **Queries** on the left side of the Database Window
2. Double-click on the query labeled “**qry_Directors**”
3. Click on the “x” at the top-right corner of “**qry_Directors**”



Click to close the query and leave the database open.

EXERCISE #2: Creating a table

1. Click Tables on the left side of the Database Window.
2. Double-click “**Create table in Design View**”
3. Enter the information, pressing tab to move between columns.
4. Click in the row labeled “**Category_ID**” and press the primary key button 
5. Press **Save**  and type “**tbl_Category**”

EXERCISE #3: Related Tables

1. What type of movie is Good Will Hunting?
Drama
2. What type of movie is “The Sting”
Thriller
3. What type of movie is “Chitty Chitty Bang Bang”?
Musical
4. How many movies are considered Romance? 3
Which one(s) are they?
Sleepless in Seattle, Titanic, When Harry Met Sally

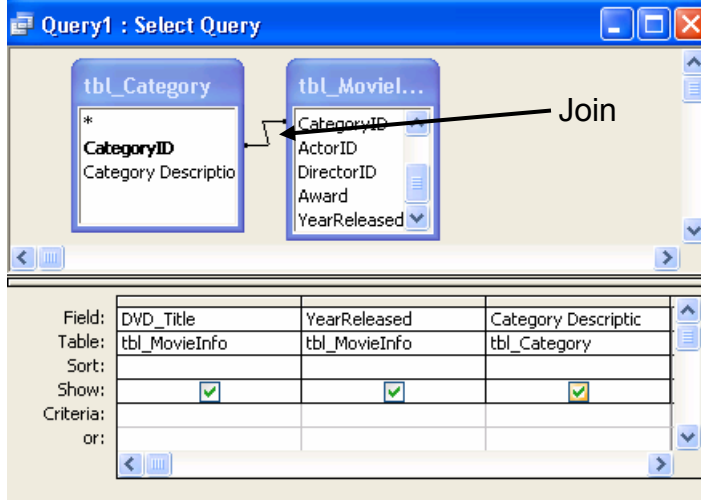
EXERCISE #4: Entering/Editing Information into a Table

1. Your table should look like this:

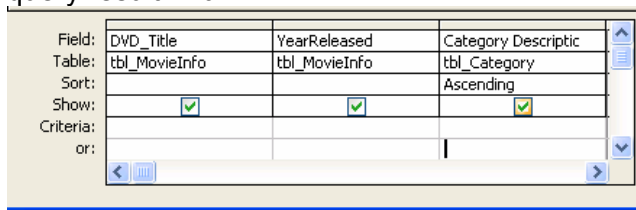
CategoryID	Category Description
1	Action
2	Drama
3	Epic
4	Fantasy
5	Musical
6	Romance
7	Thriller

EXERCISE #5: Creating a Query

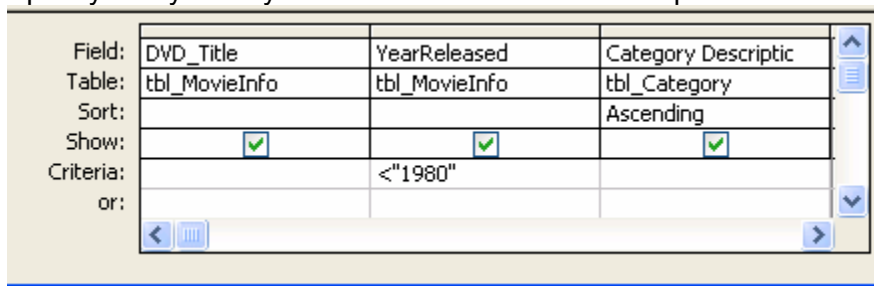
1. Create a query that displays the name of the movie and the category in which that movie belongs. (HINT: you will be using **tbl_MovieInfo** and **tbl_Category**). If there is not already a join between these two tables, create one.
2. Double-click on: **DVD_Title, Year_Released, Category_Description**



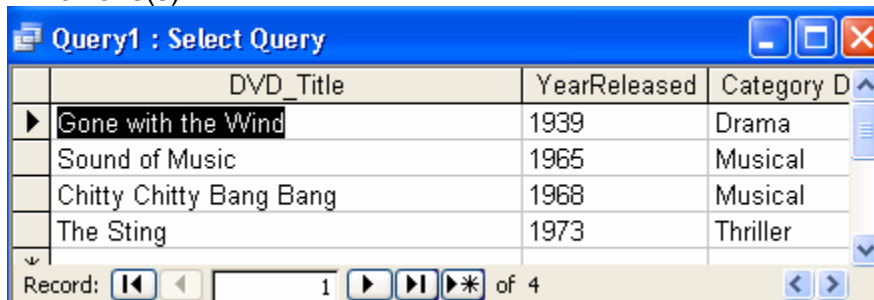
3. Sort the query by category and view the results. How many records are in the query result? **20**



4. Specify that you only want to see movies that were produced before 1980.



How many records are in the query result? **4**
Which one(s)?



5. Specify that you only want to see movies that begin with a “B” or an “S.”

Field:	DVD_Title	YearReleased	Category Descriptic
Table:	tbl_MovieInfo	tbl_MovieInfo	tbl_Category
Sort:			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	Like "B*" Or Like "s*"		
or:			

or

Field:	DVD_Title
Table:	tbl_MovieInfo
Sort:	
Show:	<input checked="" type="checkbox"/>
Criteria:	Like "b*"
or:	Like "s*"

How many records are in the query result? **5**
Which one(s)?

Query1 : Select Query

DVD_Title	YearReleased	Category Desi
Bourne Supremacy	2004	Action
Braveheart	1995	Epic
Star Wars - Attack of the Clones	2002	Fantasy
Sound of Music	1965	Musical
Sleepless in Seattle	1993	Romance
*		

Record: 1 of 5

6. Specify that you only want to see movies that are in the Drama category.

Field:	DVD_Title	YearReleased	Category Descriptic
Table:	tbl_MovieInfo	tbl_MovieInfo	tbl_Category
Sort:			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			"drama"
or:			

How many records are in the query result? **5**
Which one(s)?

Query1 : Select Query

DVD_Title	YearReleased	Category Description
Field of Dreams	1989	Drama
Forrest Gump	1994	Drama
Gone with the Wind	1939	Drama
Good Will Hunting	1997	Drama
Dances with Wolves	1990	Drama
JFK	1991	Drama
*		

Record: 1 of 6

7. Save the query as “qry_DramaDVD”