

MIS 2502 Access 2007 Tutorial

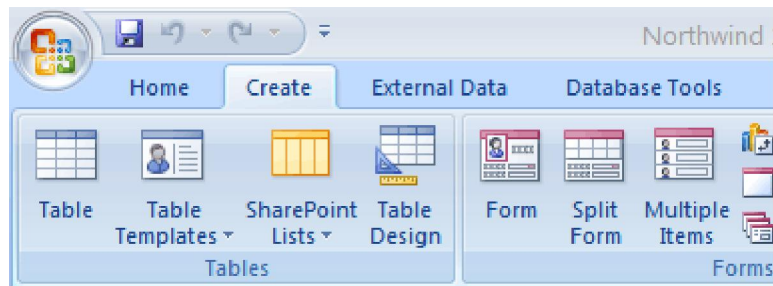
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Introduction

The Ribbon

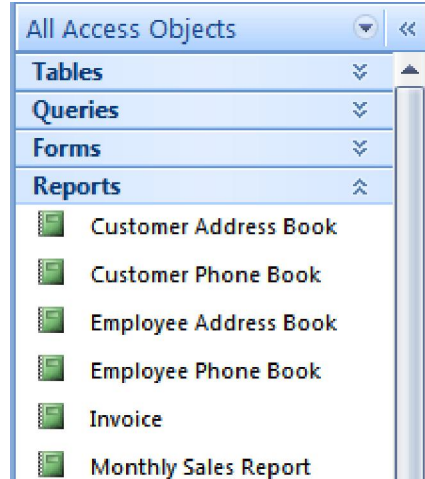
Microsoft Access 2007 offers a new user interface that includes a standard area called the **Ribbon**, which contains groups of commands that are organized by feature and functionality. The Ribbon replaces the layers of menus and toolbars found in earlier versions of Access.



Use the **Ribbon** to locate groups of related commands faster. For example, if you need to create a form or report, use one of the commands on the **Create** tab. Commands are placed closer to the surface, which means that you do not need to dig for them in menus or memorize their locations.

Navigation Pane

The **Navigation Pane** lists and provides easy access to all of the objects in the currently open database. Use the Navigation Pane to organize your objects by object type, date created, date modified, related table (based on object dependencies), or in custom groups that you create. You can easily collapse the Navigation Pane so that it takes up little space, but still remains available. The Navigation Pane replaces the Database window that was used in versions of Access earlier than Access 2007.



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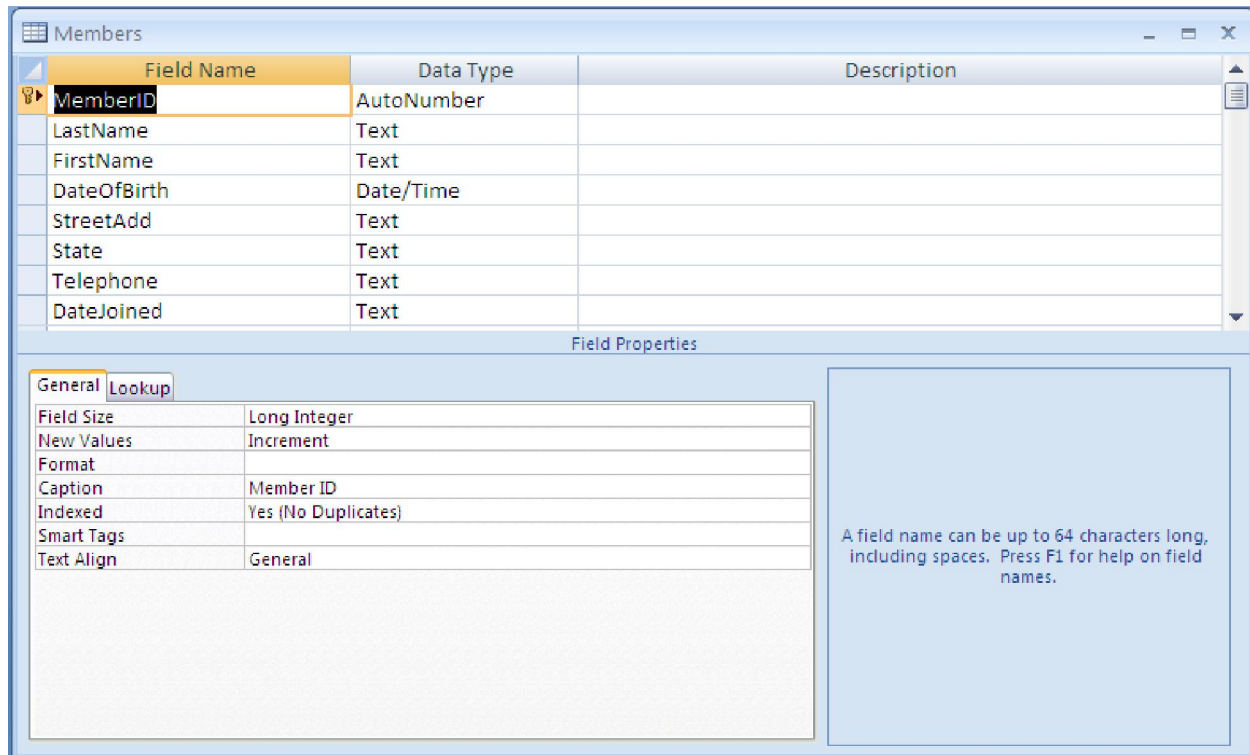
1. Creating Tables

Introduction to Tables

Tables are grids that store information in a database similar to the way an Excel worksheet stores information in a workbook. Access provides three ways to create a table for which there are icons in the Database Window. Double-click on the icons to create a table. For our purposes, we will create a table in design view.

1.1 Create a Table in Design View

Design View will allow you to define the fields in the table before adding any data to the datasheet. The window is divided into two parts: a top pane for entering the field name, data type, and an option description of the field, and a bottom pane for specifying field properties.



Field Name - This is the name of the field and should represent the contents of the field such as "Name", "Address", "Final Grade", etc. The name can not exceed 64 characters in length and may include spaces.

Data Type is the type of value that will be entered into the fields. Here are some of the datatypes available in Access:

- **Text** - The default type, text type allows any combination of letters and numbers up to a maximum of 255 characters per field record.
- **Memo** - A text type that stores up to 64,000 characters.
- **Number** - Any number can be stored.
- **Date/Time** - A date, time, or combination of both.
- **Currency** - Monetary values that can be set up to automatically include a dollar sign (\$) and correct decimal and comma positions.
- **AutoNumber** - When a new record is created, Access will automatically assign a unique integer to the record in this field. From the General options, select Increment if the numbers should be assigned in order or random if any random number should be chosen. Since

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every record in a datasheet must include at least one field that distinguishes it from all others, this is a useful data type to use if the existing data will not produce such values.

- **Yes/No** - Use this option for True/False, Yes/No, On/Off, or other values that must be only one of two.
- **OLE Object** - An OLE (Object Linking and Embedding) object is a sound, picture, or other object such as a Word document or Excel spreadsheet that is created in another program. Use this data type to embed an OLE object or link to the object in the database.
- **Hyperlink** - A hyperlink will link to an Internet or Intranet site, or another location in the database. The data consists of up to four parts each separated by the pound sign (#): DisplayText#Address#SubAddress#ScreenTip. The Address is the only required part of the string. Examples:
 - Internet hyperlink example:
§ FGCU Home Page #<http://www.fgcu.com>#
 - Database link example:
§ C:\My Documents\database.mdb#mytable

Description (optional) - Enter a brief description of what the contents of the field are.

Field Properties - Select any pertinent properties for the field from the bottom pane.

1.2 Field Properties

Properties for each field are set from the bottom pane of the Design View window.

- **Field Size** is used to set the number of characters needed in a text or number field. The default field size for the text type is 50 characters. If the records in the field will only have two or three characters, you can change the size of the field to save disk space or prevent data entry errors by limiting the number of characters allowed. Likewise, if the field will require more than 50 characters, enter a number up to 255. The field size is set in exact characters for Text type, but options are for numbers:

Byte	Positive integers between 1 and 255
Integer	Positive and negative integers between -32,768 and 32,768
Long Integer (default)	Larger positive and negative integers between -2 billion and 2 billion.
Single	Single-precision floating-point number
Double	Double-precision floating-point number
Decimal	Allows for Precision and Scale property control

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- **Format** confirms the data in the field to the same format when it is entered into the datasheet. For text and memo fields, this property has two parts that are separated by a semicolon. The first part of the property is used to apply to the field and the second applies to empty fields.
 - **Text and memo format.**

Text Format			
Format	Datasheet Entry	Display	Explanation
@@-@@@	1234567	123-4567	@ indicates a required character or space
@@-@@@&	123456	123-456	& indicates an optional character or space
<	HELLO	hello	< converts characters to lowercase
>	Hello	HELLO	> converts characters to uppercase
@!	Hello	Hello!	\ adds characters to the end
@;"No Data Entered"	Hello	Hello	
@;"No Data Entered"	(blank)	No Data Entered	

- **Number format.** Select one of the preset options from the drop down menu or construct a custom format using symbols explained below:

Number Format			
Format	Datasheet Entry	Display	Explanation
###,##0.00	123456.78	123,456.78	0 is a placeholder that displays a digit or 0 if there is none.
###,##0.00	0	\$0.00	# is a placeholder that displays a digit or nothing if there is none.
###.00%	.123	12.3%	% multiplies the number by 100 and added a percent sign

Currency format: This formatting consists of four parts separated by semicolons: format for positive numbers; format for negative numbers; format for zero values; format for Null values.

Currency Format	
Format	Explanation
##0.00; (##0.00)[Red]; \$0.00; "none"	Positive values will be normal currency format, negative numbers will be red in parentheses, zero is entered for zero values, and "none" will be written for Null values.

Date format. In the table below, the value "1/1/01" is entered into the datasheet, and the following values are displayed as a result of the different assigned formats.

Date Format		
Format	Display	Explanation

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dddd", "mmm d", "yyyy	Monday, January 1, 2001	dddd, mmmm, and yyyy print the full day name, month name, and year
ddd", "mmm ". " d", "yy	Mon, Jan. 1, '01	ddd, mmm, and yy print the first three day letters, first three month letters, and last two year digits
"Today is " dddd	Today is Monday	
h:n:s: AM/PM	12:00:00 AM	"n" is used for minutes to avoid confusion with months

Yes/No fields are displayed as check boxes by default on the datasheet. To change the formatting of these fields, first click the Lookup tab and change the Display Control to a text box. Go back to the General tab choices to make formatting changes. The formatting is designated in three sections separated by semicolons. The first section does not contain anything but the semicolon must be included. The second section specifies formatting for Yes values and the third for No values.

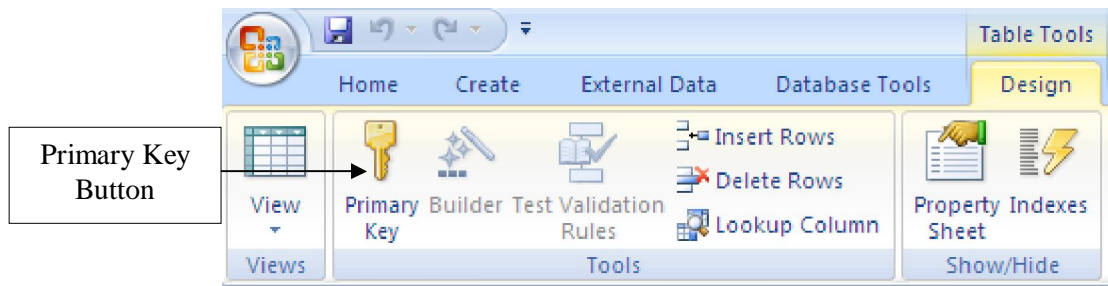
Format	Explanation
;"Yes"[green];"No"[red]	Prints "Yes" in green or "No" in red

Default Value - There may be cases where the value of a field will usually be the same for all records. In this case, a changeable default value can be set to prevent typing the same thing numerous times. Set the Default Value property.

Primary Key

Every record in a table must have a primary key that differentiates it from every other record in the table. In some cases, it is only necessary to designate an existing field as the primary key if you are certain that every record in the table will have a different value for that particular field. A social security number is an example of a record whose values will only appear once in a database table.

By default, Access automatically name the first field **ID** and indicates it as the primary key field. However, you can designate a primary key field by right-clicking on the record and selecting **Primary Key** from the shortcut menu or selecting primary key from the Ribbon or Menu Bar



The primary key field will be noted with a key image to the left. To remove a primary key, repeat one of these steps.

Table1	
Field Name	Data Type
Actor_ID	AutoNumber
Actor_FName	Text
Actor_LName	Text

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If none of the existing fields in the table will produce unique values for every record, a separate field must be added. Access will prompt you to create this type of field at the beginning of the table the first time you save the table and a primary key field has not been assigned. The field is named "ID" and the data type is "autonumber". Since this extra field serves no purpose to you as the user, the autonumber type automatically updates whenever a record is added so there is no extra work on your part. You may also choose to hide this column in the datasheet as explained on a later page in this tutorial.

Indexes

Creating indexes allows Access to query and sort records faster. To set an indexed field, select a field that is commonly searched and change the Indexed property to **Yes (Duplicates OK)** if multiple entries of the same data value are allowed or **Yes (No Duplicates)** to prevent duplicates.

1.3 Field Validation Rules

Validation Rules specify requirements for the data entered in the worksheet. A customized message can be displayed to the user when data that violates the rule setting is entered. Click the expression builder ("...") button at the end of the Validation Rule box to write the validation rule. Examples of field validation rules include $\lt; 0$ to not allow zero values in the record, and $???$ to only allow all data strings three characters in length.

1.4 Input Masks

An input mask controls the value of a record and sets it in a specific format. They are similar to the Format property, but instead display the format on the datasheet before the data is entered. For example, a telephone number field can be formatted with an input mask to accept ten digits that are automatically formatted as "(999) 888-7777". The blank field would look like (____) ____-____. An input mask to a field by following these steps:

1. In design view, place the cursor in the field that the input mask will be applied to.
2. Click in the white space following **Input Mask** under the **General** tab.
3. Click the "..." button to use the wizard or enter the mask, $(@@@) @@@-@@@@$, into the field provided. The following symbols can be used to create an input mask from scratch:

Input Mask Symbols	
Symbol	Explanation
A	Letter or digit
0	A digit 0 through 9 without a + or - sign and with blanks displayed as zeros
9	Same as 0 with blanks displayed as spaces
#	Same as 9 with +/- signs
?	Letter
L	Letter A through Z
C or &	Character or space
<	Convert letters to lower case
>	Convert letters to upper case

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Exercise:

1. Create the following tables:

VideoDistributor											
Attribute	PK	Data type	Size	Required	Validation Rule	Validation Text	Format	Default Value	Caption	FK	Referenced Table
DistributorID	Y	AutoNumber		Y					Distributor ID	N	
DistributorName	N	Text	35	Y					Distributor	N	

VideoCategory											
Attribute	PK	Data type	Size	Required	Validation Rule	Validation Text	Format	Default Value	Caption	FK	Referenced Table
CategoryID	Y	AutoNumber		Y					Category ID	N	
CategoryName	N	Text	35	Y					Category	N	

VideoTitles											
Attribute	PK	Data type	Size	Required	Input Mask	Validation Rule	Format	Caption	FK	Referenced Table	
TitleID	Y	AutoNumber		Y				Title ID			
VideoTitle	N	Text	50	Y				Video Title			
ReleaseDate	N	Date/Time		Y	XX/XX/XXXX	>=01/01/1900	Short Date	Release Date			
VideoDuration	N	Number(Long Integer)		N				Duration			
DistributorName	N	(LookUp)		Y				Distributor	Y	VideoDistributor	
CategoryName	N	(LookUp)		Y				Category	Y	VideoCategory	

2. Populate the tables:

- Populate the following tables with these records:

VideoCategory

Category ID	Category
1	Action
2	Horror
3	Thriller
4	Sci-Fi

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5	Drama
---	-------

VideoDistributor

Distributor ID	Distributor Name
1	Crazy Video
2	SBC Video
3	DVDNow
4	East Park Media
5	Scary Entertainment

VideoTitles

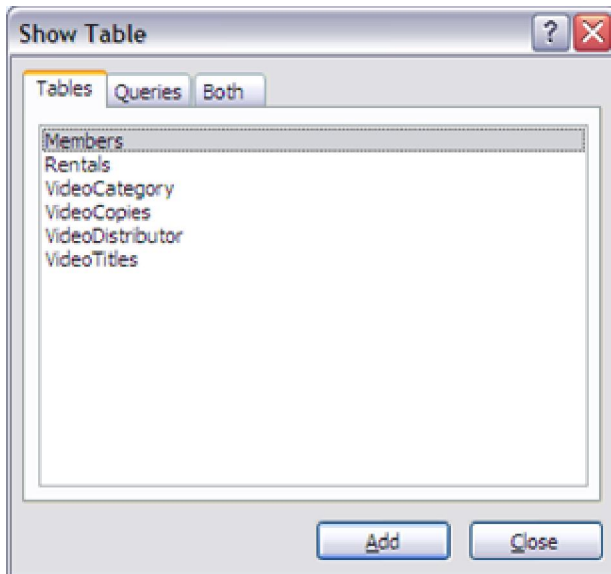
Title ID	Video Title	Release Date	Duration	Distributor	Category
1	Freedom Day	01/12/2006	140	Crazy Video	Action
2	Sea Trek	12/3/2000	190	Crazy Video	Sci-Fi
3	Gone with the Air	11/20/1964	300	DVDNow	Drama
4	Ex-Terminator	06/13/1999	200	SBC Video	Action
5	Buccaneers of the Caribbean	10/16/1984	119	East Park Media	Action

1. Table Relationships

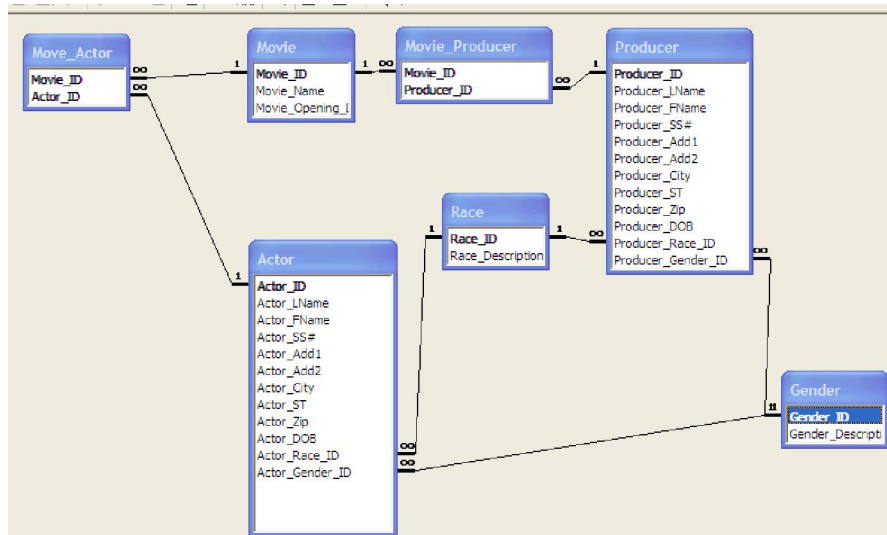
Table Relationships

A primary key in one table should match the foreign key in the corresponding table and the two attributes must be of the same data type. To view the relationships tool, select **Database Tools** → **Relationships** on the **Ribbon** or **Menu Bar**. The Show Table Dialog appears listing all of the tables in the database.

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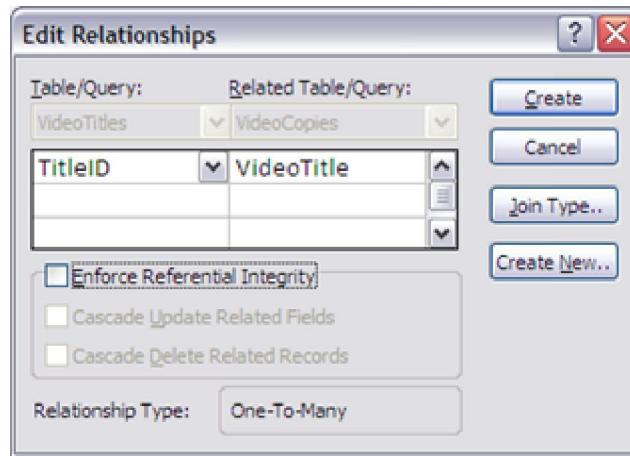


1. Highlight tables and click on Add. The tables will appear connected if the primary keys were added correctly as indicated below.

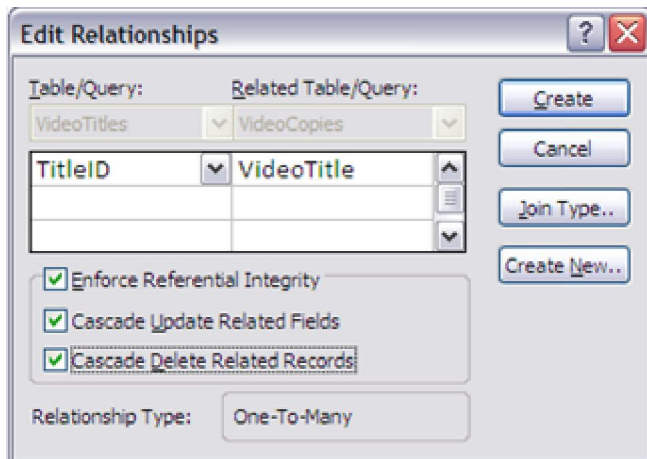


2. If the relationships do not create automatically, the user can create relationships on demand. Click on name of attribute which is foreign key in 1 table.
 - 2.1. Click and drag to corresponding attribute in second table.
 - 2.2. The Edit relationships dialog will appear showing the tables and associated attributes selected.
 - 2.3. The relationship type will appear automatically based on information entered when tables created.

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3. You need to enforce referential integrity so click on enforce referential integrity. Cascade on Update and Cascade on Delete will appear. Select both.



4. A line now connects the two fields in the Relationship window.
5. Expand the tables by clicking and dragging each table to ensure that each table is completely visible, there are no scroll bars, and relationships cross at a minimum. Below are examples of the table with additional attributes not visible and then all the attributes visible (and no scroll bars).

Example with Scroll Bars:

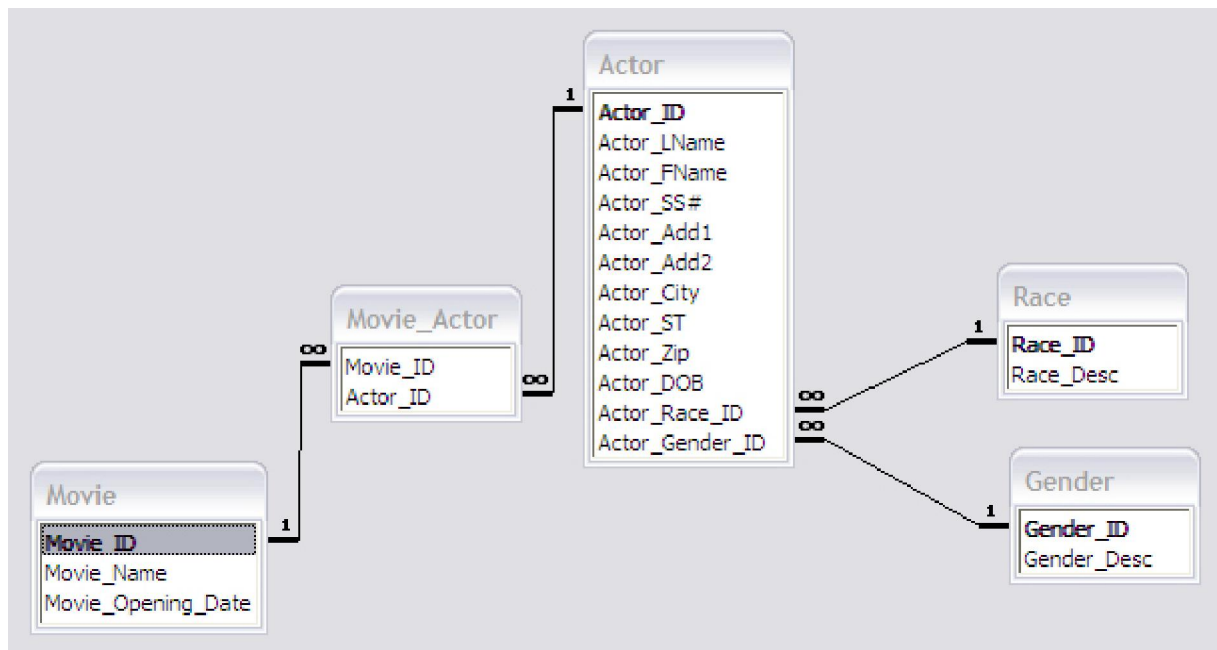


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Example with No Scroll Bars:

Actor
Actor_ID
Actor_LName
Actor_FName
Actor_SS#
Actor_Add1
Actor_Add2
Actor_City
Actor_ST
Actor_Zip
Actor_DOB
Actor_Race_ID
Actor_Gender_ID

Example of a completely visible ERD (Entity Relationship Diagram):



- The datasheet of a relational table will provide expand and collapse indicators to view sub datasheets containing matching information from the other table. In the example below, the student address database and student grade database were related and the two can be shown simultaneously using the expand feature. To expand or collapse all sub datasheets at once, select the **Home** tab on the **Ribbon or Menu Bar**. From the **Records** section, select **More->Subdatasheet->Expand All** or **Collapse All**.

VideoTitles						
TitleID	VideoTitle	ReleaseDate	VideoDurati	Distributor	Category Na	
1	Freedom Day	1/12/2006	140	Crazy Video	Action	
	VideoCopyII	CurrentlyRe	Add New Field			
		<input checked="" type="checkbox"/>				
*	(New)	<input type="checkbox"/>				

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Exercise:

Using the tables that you created above, create an ERD using the relationship tool and enforce referential integrity.

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2. Queries

Introduction to Queries

Queries select records from one or more tables in a database so they can be viewed, analyzed, and sorted on a common datasheet. The resulting collection of records, called a **dynaset** (short for dynamic subset), is saved as a database object and can therefore be easily used in the future. The query will be updated whenever the original tables are updated. There are various types of queries. The most typical is the **select query** that extracts data from tables based on specified values, **find duplicate** queries that display records with duplicate values for one or more of the specified fields, and **find unmatched** queries display records from one table that do not have corresponding values in a second table.


You use queries to view, change, and analyze data in different ways. You can also use them as a source of records for forms, reports, and data access pages (data access page: A Web page, published from Access that has a connection to a database. In a data access page, you can view, add to, edit, and manipulate the data stored in the database. A page can also include data from other sources, such as Excel).

3.1 Type of Queries

There are several types of queries in Microsoft Access:

1. Select Queries: A select query is the most common type of query. It retrieves data from one or more tables and displays the results in a datasheet where you can update the record(s), with some restrictions. You can also use a select query to group records and calculate sums, counts, averages, and other types of totals.

1.1 Query Wildcards

The following table provides examples for some of the wildcard symbols and arithmetic operators that may be used. The **Expression Builder**  can also be used to assist in writing the expressions.

Query Wildcards and Expression Operators

Wildcard / Operator	Explanation
? Street	The question mark is a wildcard that takes the place of a single letter.
43th *	The asterisk is the wildcard that represents a number of characters.
<100	Value less than 100
>=1	Value greater than or equal to 1
<>"FL"	Not equal to (all states besides Florida)
Between 1 and 10	Numbers between 1 and 10
Is Null Is Not Null	Finds records with no value or all records that have a value
Like "a*"	All words beginning with "a"
>0 And <=10	All numbers greater than 0 and less than 10

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"Bob" Or "Jane" Values are Bob or Jane

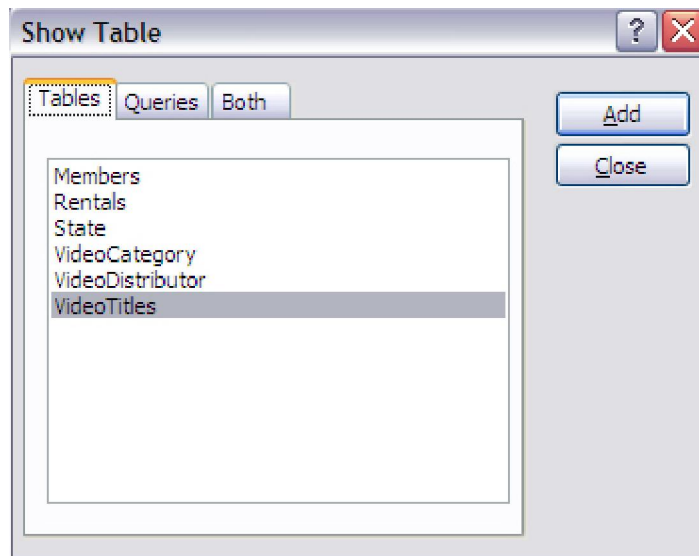
Example:

This example will use a select query to display all videos in the database with category of drama, sorted by distributor.

1. From the **Ribbon** or **Menu Bar**, click on the **Create** tab then select **Query Design** in the Other section.



2. In the Show Table window, add the tables you created in Part 1.



3. Note the asterisk (*) in the tables you created. This is a SQL special character that tells the system that you wish to include ALL the attributes in the table to appear in the output. You can also select individual attributes to print out. The order of the attributes you select corresponds to the order that those attributes will appear in the output.
 - For example, the following SQL statement will display all the attributes in the Category table:

```
SELECT * FROM VideoCategory
```