



PowerPoint Presentation to Accompany *GO! All In One*

Chapter 13

Create, Query, and Sort an Access Database; Create
Forms and Reports

Objectives

- **Identify Good Database Design**
- **Create a Table and Define Fields in a New Database**
- **Change the Structure of Tables and Add a Second Table**
- **Create and Use a Query, Form, and Report**
- **Save and Close a Database**

Objectives

- **Open an Existing Database**
- **Create Table Relationships**
- **Sort Records in a Table**
- **Create a Query in Design View**
- **Create a New Query from an Existing Query**

Objectives

- **Sort Query Results**
- **Specify Criteria in a Query**
- **Specify Numeric Criteria in a Query**
- **Use Compound Criteria**
- **Create a Query Based on More Than One Table**

Objectives

- **Use Wildcards in a Query**
- **Use Calculated Fields in a Query**
- **Calculate Statistics and Group Data in a Query**
- **Create a Crosstab Query**

Identify Good Database Design

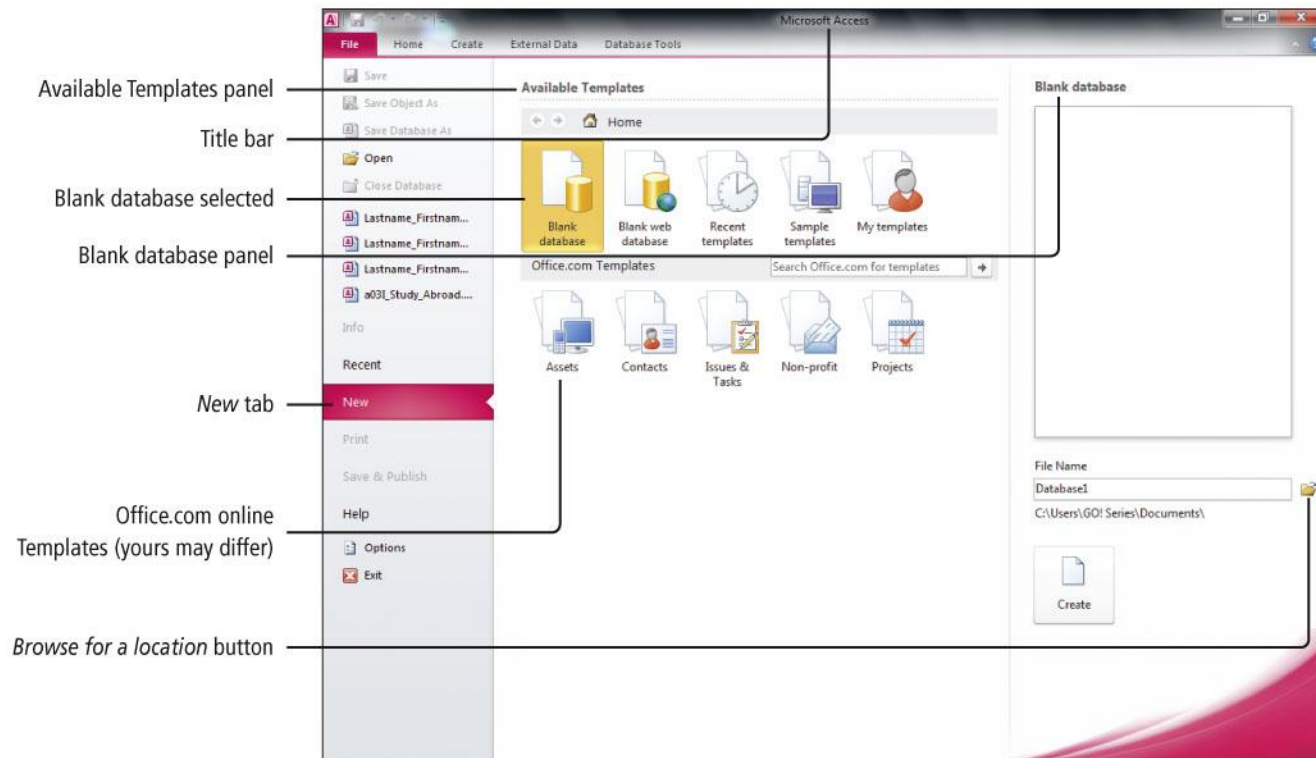
- **Database**
 - An organized collection of *data*—facts about people, events, things, or ideas—related to a specific topic or purpose
- **Information**
 - Data that is organized in a useful manner
- **Flat database**
 - Simple database because it is not related or linked to any other collection of data
- **Relational database**
 - Multiple collections of data in the database are related to one another

Identify Good Database Design

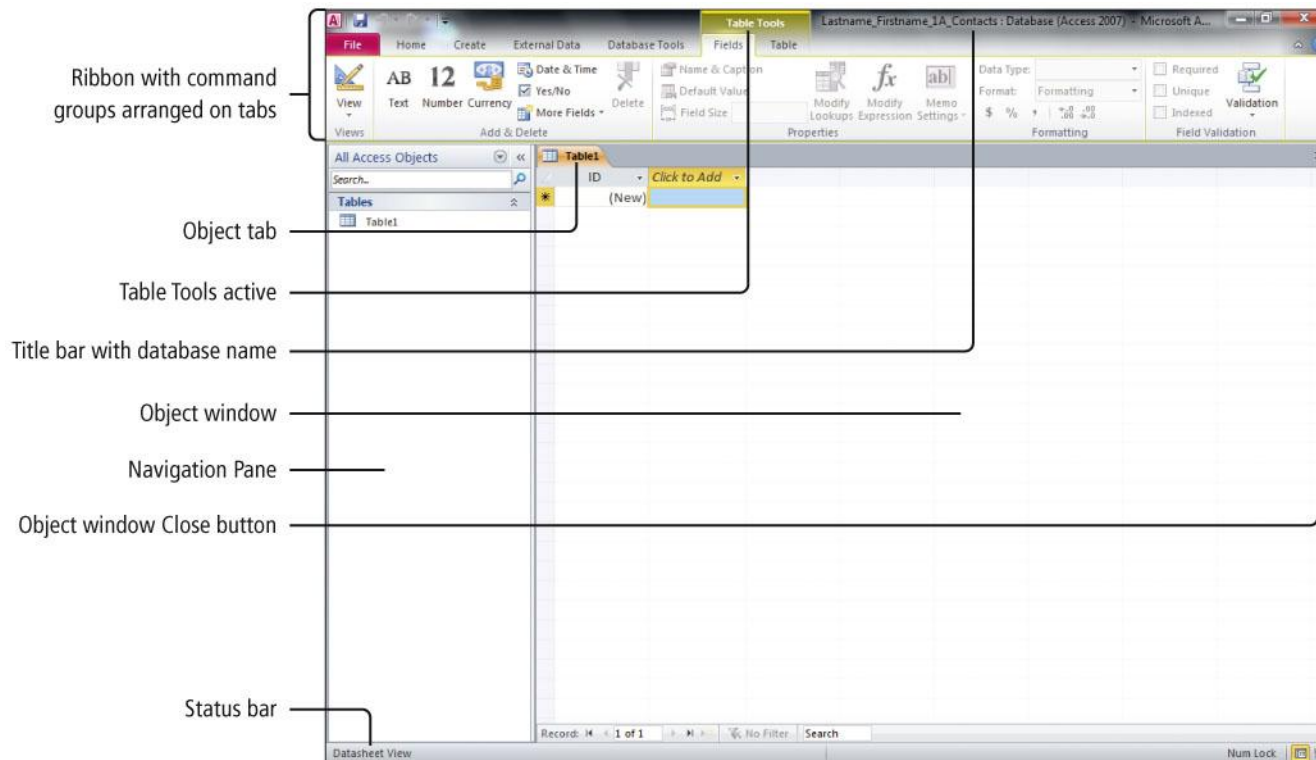
- **Use good design techniques when creating a new database**
 - Determine the information you want to keep track of to create a new database
 - Ask yourself, “What questions should this database be able to answer for me?”
 - The purpose of a database is to store data in a manner that makes it easy for you to get the information you need

Create a Table and Define Fields in a New Database

- Backstage view

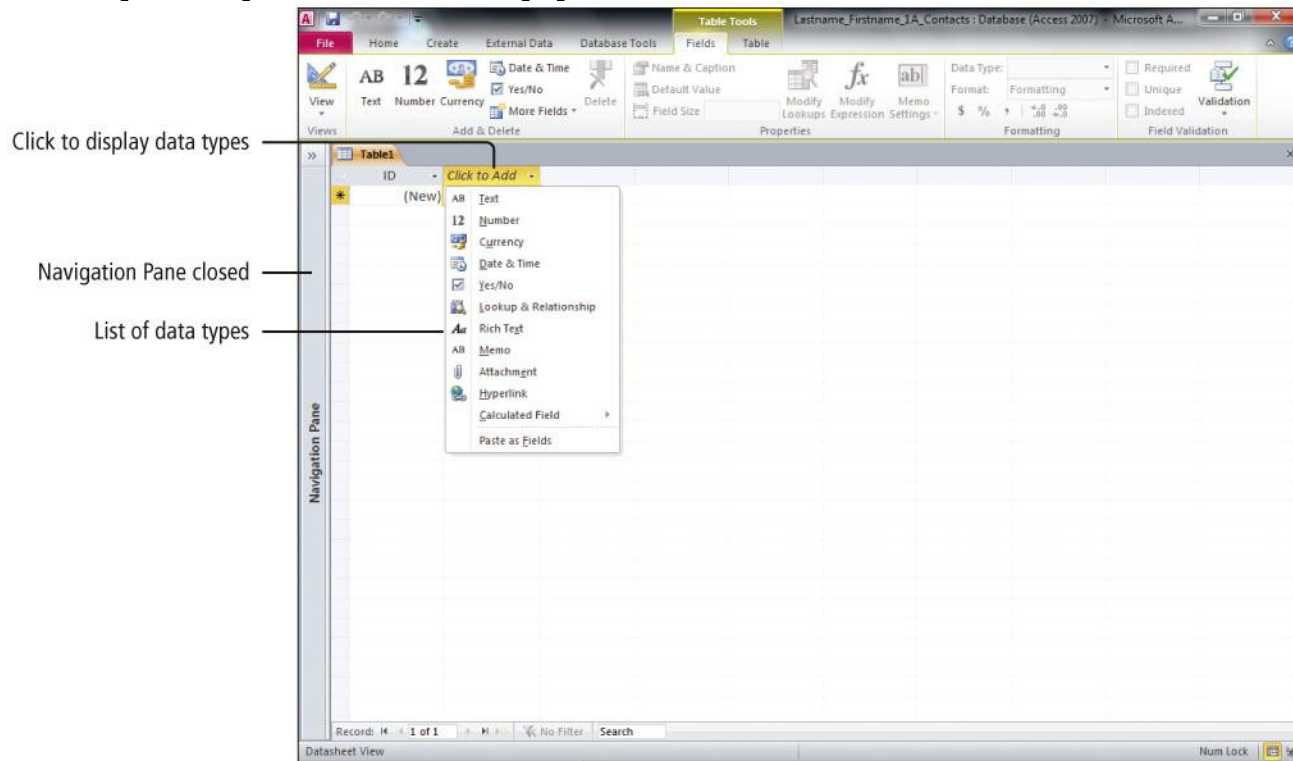


Create a Table and Define Fields in a New Database



Create a Table and Define Fields in a New Database

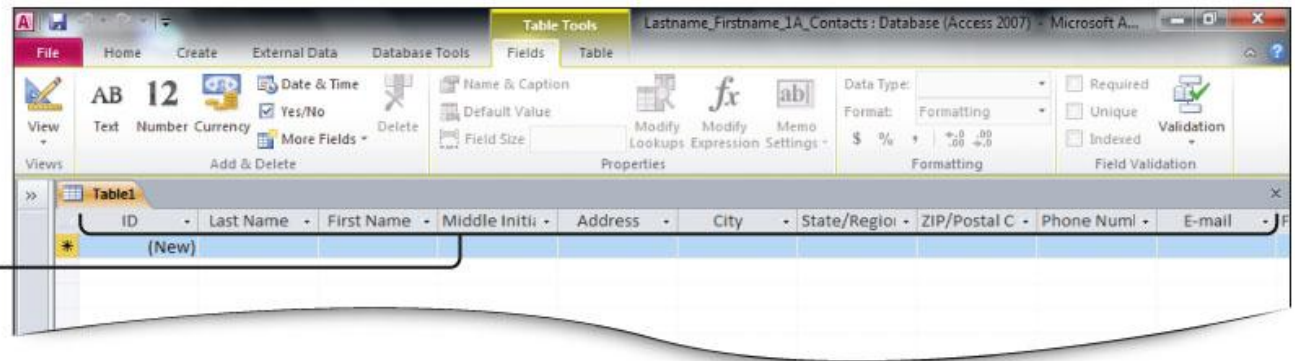
- Display data types



Create a Table and Define Fields in a New Database

- Using the horizontal scroll bar

Twelve fields created—scroll to the left to display *ID* and *Last Name* fields



Create a Table and Define Fields in a New Database

- Renaming fields and changing data types

The screenshot shows the Microsoft Access interface with the 'Table Tools' ribbon active. The 'Fields' group is selected, and the 'Student ID' field is highlighted in the table design grid. The 'Data Type' property is set to 'Text'. The 'Field Size' is set to 255. The 'Required' property is checked. The 'Unique' property is checked. The 'Indexed' property is checked. The 'Field Validation' property is set to 'Field Validation'. The 'Table Tools' ribbon also shows the 'Name & Caption' group with 'Name & Caption', 'Default Value', 'Field Size', 'Properties', 'Modify Lookups', 'Expression Settings', and 'Memo' options. The 'Table Tools' ribbon also shows the 'Table' group with 'Add & Delete' and 'Delete' options. The 'Table Tools' ribbon also shows the 'Table' group with 'Add & Delete' and 'Delete' options. The 'Table Tools' ribbon also shows the 'Table' group with 'Add & Delete' and 'Delete' options.

Field renamed

New record row—indicated by asterisk

Selected field

Data type indicates Text

Create a Table and Define Fields in a New Database

- Adding a record to a table

Pencil icon indicates record being entered or edited

Record selector box

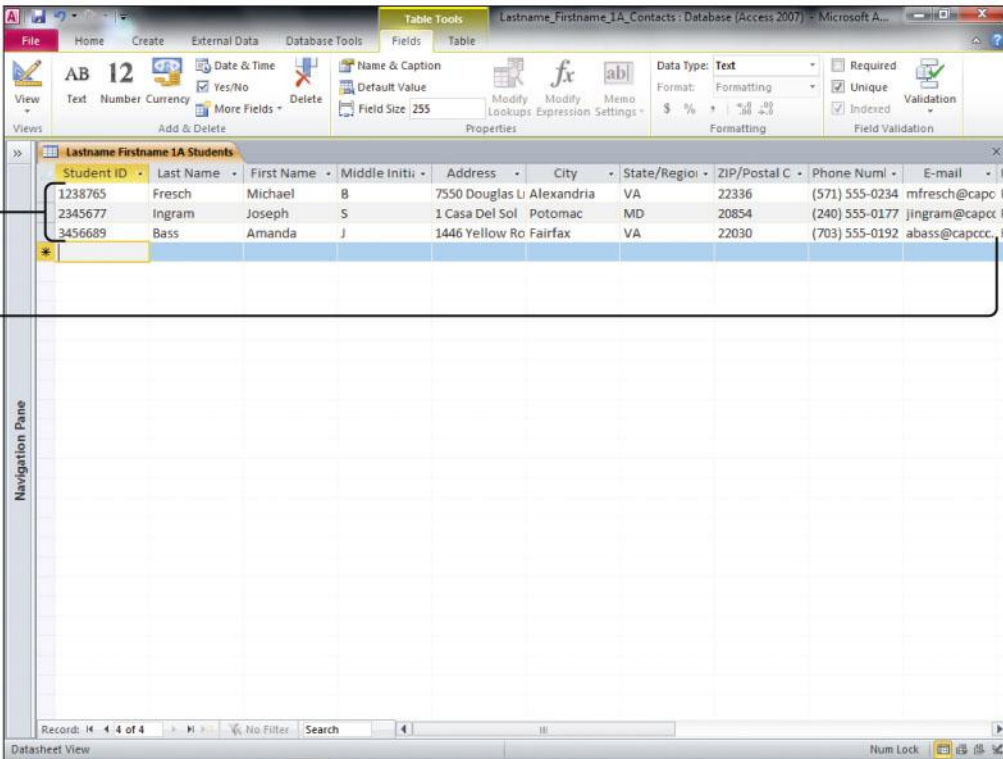
First student ID is 1238765

Insertion point in Last Name field

Student ID	Last Name	First Name	Middle Initial	Address	City	State/Region	ZIP/Postal C	Phone Numl	E-mail	F
1238765										

Create a Table and Define Fields in a New Database

- Adding additional records to a table



The screenshot shows the Microsoft Access interface with a table named "Lastname Firstname 1A Students" in Datasheet View. The table has the following columns: Student ID, Last Name, First Name, Middle Initial, Address, City, State/Region, ZIP/Postal Code, Phone Number, and E-mail. Three records are visible, and a new record is being added in the fourth row. The status bar at the bottom indicates "Record: 4 of 4".

Student ID	Last Name	First Name	Middle Initial	Address	City	State/Region	ZIP/Postal Code	Phone Number	E-mail
1238765	Fresch	Michael	B	7550 Douglas L	Alexandria	VA	22336	(571) 555-0234	mfresch@capcc
2345677	Ingram	Joseph	S	1 Casa Del Sol	Potomac	MD	20854	(240) 555-0177	jingram@capcc
3456689	Bass	Amanda	J	1446 Yellow Ro	Fairfax	VA	22030	(703) 555-0192	abass@capcc
*									

Records for three students entered

Some fields out of view—your screen may vary in number of columns displayed

Create a Table and Define Fields in a New Database

- Importing data to an existing Access table

Field names in Excel sheet exactly match field names in Access table

Scroll bars indicate more data

Student ID	Last Name	First Name	Middle Initial	Address	City
1	Barchmaier	Joel	A	888 King St	Rockville
2	Telfer	Larry	J	6 Overlook Rd	Arlington
3	Vohra	Ashwin	M	120 Devonshire Ct	Alexandria
4	McElaney	Cieta	E	3 Wythe St	Alexandria
5	Wall	WenLi	Z	1678 Mountain View Ave	Vienna
6	Caputo	Stephanie	S	26 Fairfax St	West Springfie
7	Thomas	Carlis	A	543 Rosemary Ln	Alexandria
8	Reid	Carla	N	413 S Jefferson St	Fairfax
9	Stavish	Joseph	C	441 Yoakum Pkwy	Washington
10	Hernandez	Anna	R	90 Hartwell Ct	Alexandria
11	Alexander	Rebekah	A	43 Buttercup Pl	Manassas
12	Morris	Atonye	O	67 Commerce Ct	Manassas
13	Nguyen	Cong	L	160 Spriggs Rd	Falls Church
14	Bradley	Christine	Y	384 Hollywood Rd	Arlington

Create a Table and Define Fields in a New Database

- Design View

The screenshot shows the Microsoft Access Design View for a table named 'Student ID'. The interface includes a ribbon with the 'Table Tools' and 'Design' tabs. The main area is a table with columns for 'Field Name', 'Data Type', and 'Description'. The 'Field Name' column contains the following fields: Student ID, Last Name, First Name, Middle Initial, Address, City, State/Region, ZIP/Postal Code, Phone Number, E-mail, Faculty Advisor ID, and Amount Owed. The 'Data Type' column shows 'Text' for most fields and 'Currency' for 'Amount Owed'. The 'Description' column is empty. Below the table is the 'Field Properties' area, which is currently empty. On the left side, there is a 'Navigation Pane'.

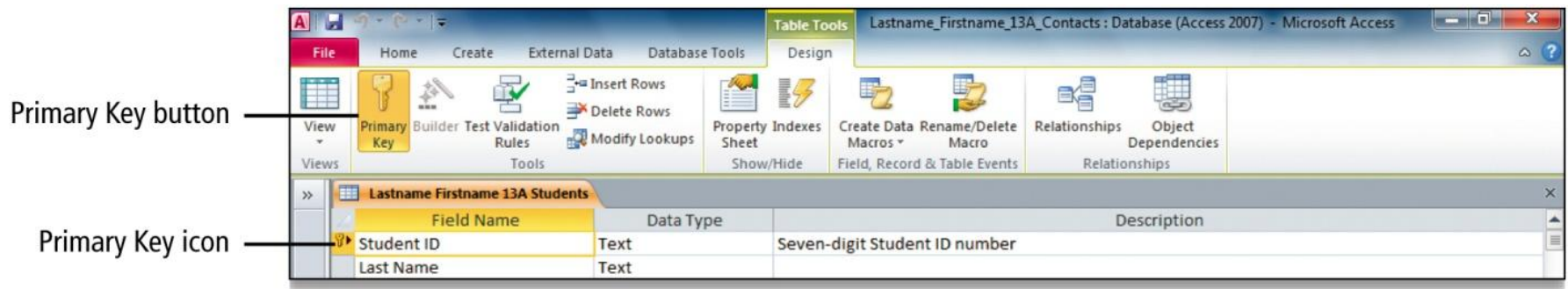
Labels on the left side of the screenshot point to various elements:

- Delete Rows button
- Data Type column
- Field Name column
- Row selector box for Middle Initial field
- Space to add field description
- Field Properties area

Field Name	Data Type	Description
Student ID	Text	
Last Name	Text	
First Name	Text	
Middle Initial	Text	
Address	Text	
City	Text	
State/Region	Text	
ZIP/Postal Code	Text	
Phone Number	Text	
E-mail	Text	
Faculty Advisor ID	Text	
Amount Owed	Currency	

Change the Structure of Tables and Add a Second Table

- Viewing a primary key in Design view



Change the Structure of Tables and Add a Second Table

and Add a Second Table

- Adding a second table to a database by importing an Excel spreadsheet

Import Spreadsheet Wizard dialog box

Excel column titles

Spreadsheet data—Excel rows become records

Navigation Pane

Next button

Faculty ID	Rank	Campus	Last Name	First Name	Address
1 FAC-0993	Professor	Central	Betancourt	Charles	25 Yoakum Park
2 FAC-0767	Professor	Jefferson	Soja	Binit	10 Rock Forest
3 FAC-1133	Professor	Washington	Bell	Dora	15 12th St SE
4 FAC-1283	Professor	Washington	Hart-Rodriguez	Melanie	87 Westlake Dr
5 FAC-1772	Professor	Jefferson	Haq	Mark	665 Javier Rd
6 FAC-2234	Professor	Washington	Grafen	Julia	843 2nd St NW
7 FAC-2245	Professor	Washington	Szulkin	Martin	776 Mt Pleasant
8 FAC-2289	Assistant Professor	Jefferson	Sideris	Dana	8 Thoreau Dr
9 FAC-2322	Professor	Capital	Briggs	Luis	54 Beauregard S
10 FAC-2369	Associate Professor	Capital	Sweeney	Megan	45 Madison Ave
11 FAC-2375	Associate Professor	Central	Torres	Robert	156 Camrose Ter
12 FAC-2377	Associate Professor	Central	Kubzansky	Amy	156 Cedarcrest
13 FAC-2877	Professor	Capital	Treiman	Roger	432 3rd St N
14 FAC-2998	Professor	Washington	Holland	Timothy-John	H521 19th St

Change the Structure of Tables and Add a Second Table

- Adjusting column widths

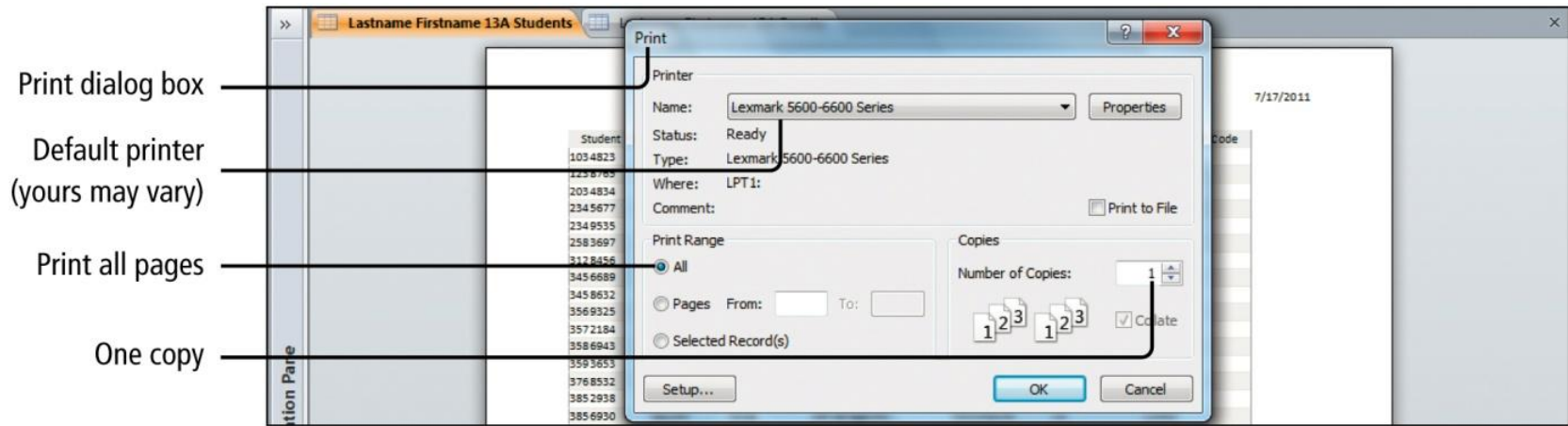
Pointer positioned on right edge of Address field

The screenshot shows the Microsoft Access interface with the 'Table Tools' ribbon active. The 'Table' tab is selected, and the 'Field Size' property is set to 7. The table 'Lastname Firstname 13A Students' is displayed with the following data:

Student ID	Last Name	First Name	Address	City	State/Region	ZIP/Postal Code	Phone Number	E-mail	Faculty Advisor
1034823	Barthaier	Joel	888 King St	Rockville	MD	20857	(301) 555-2320	jbarthaier@capcc	FAC-2234
1238765	Fresch	Michael	7550 Douglas Ln	Alexandria	VA	22336	(571) 555-0234	mfresch@capcc	FAC-2289
2034834	Telfer	Larry	6 Overlook Rd	Arlington	VA	22226	(571) 555-2017	ltelfer@capcc	FAC-2245
2345677	Ingram	Joseph	1 Casa Del Sol	Potomac	MD	20854	(240) 555-0177	jingram@capcc	FAC-2377

Change the Structure of Tables and Add a Second Table

- **Printing a table**

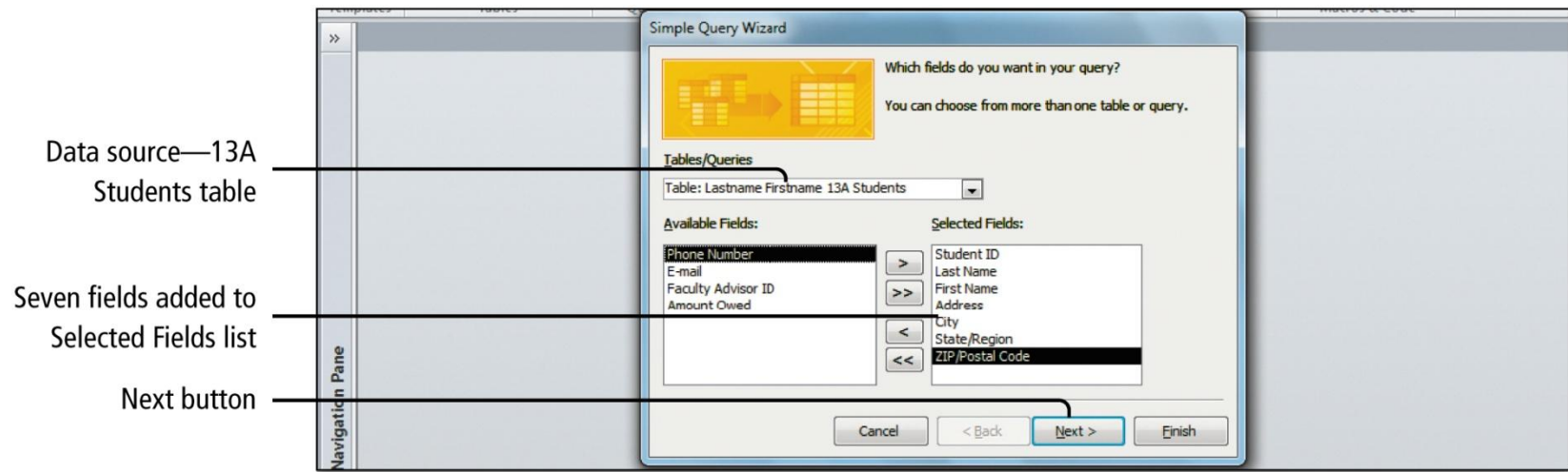


Create and Use a Query, Form, and Report

- **Query**
 - A database object that retrieves specific data from one or more database objects—either tables or other queries
- **Form**
 - A database object with which you can enter data, edit data, or display data from a table or a query
- **Report**
 - A database object that displays the fields and records from a table or a query in an easy-to-read format suitable for printing

Create and Use a Query, Form, and Report

- Using the Add Field button



Create and Use a Query, Form, and Report

- In the Sort & Filter group, click the ascending button

Ascending button selected

Four fields display in report

Report sorted by Last Name field

E-mail addresses display on one line

Campus	Last Name	First Name	E-mail
Washington	Abromsky	Alexandru	aabromsky@capccc.edu
Washington	Bell	Dora	dbell@capccc.edu
Central	Betancourt	Charles	cbetancouret@capccc.edu
Central	Bowman	Nuzhut	nbowman@capccc.edu
Capital	Briggs	Luis	lbriggs@capccc.edu
Jefferson	Capella	Arturo	acapelle@capccc.edu
			gfriender@capccc.edu

Create and Use a Query, Form, and Report

- Display the Report in Print Preview

Two Pages button

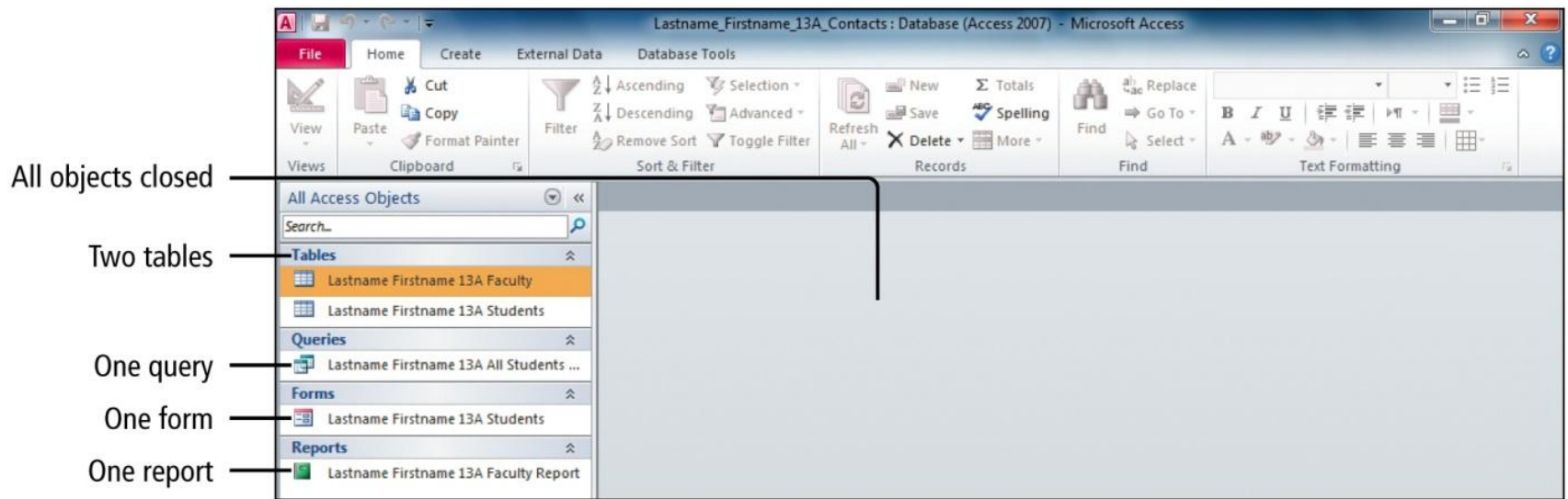
Page number at bottom of second page

Campus	Last Name	First Name	E-mail
Washington	Adams	Adam	adamsa@capcc.edu
Washington	Bell	Dora	dbell@capcc.edu
Centre	Bethcourt	Charles	cbethcour@capcc.edu
Centre	Bowman	Walter	wbowman@capcc.edu
Capital	Brigg	Luis	lbrigg@capcc.edu
Jefferson	Capelle	Arthur	acapelle@capcc.edu
Capital	Friend	Paul	pfriend@capcc.edu
Jefferson	Gilmore	Teanne	tgilmore@capcc.edu
Capital	Gooden	Shirley	sgooden@capcc.edu
Washington	Groves	Julia	jjgroves@capcc.edu
Jefferson	Hallett	Jessie	jhallett@capcc.edu
Jefferson	Hess	Mark	mhess@capcc.edu
Washington	Horn-Rogers	Nelanie	nhorn-rog@capcc.edu
Jefferson	Hawkins	Larita	lhawkins@capcc.edu
Washington	Howard	Timothy	thoward@capcc.edu
Jefferson	Kirkland	Theresa	tkirkland@capcc.edu
Centre	Kubersky	Amy	akubersky@capcc.edu
Jefferson	Laird	Phillip	plaird@capcc.edu
Capital	Mumford	Rayne	rmumford@capcc.edu
Washington	Ort	Joe	joort@capcc.edu
Centre	Seguy	Alma	aseguy@capcc.edu
Jefferson	Stevens	Beth	bstevens@capcc.edu
Jefferson	Sisk	Britt	bsisk@capcc.edu
Capital	Sun	Kington	ksun@capcc.edu
Capital	Swensky	Walter	wswensky@capcc.edu
Washington	Stallen	Marlin	mstallen@capcc.edu
Centre	Torres	Robert	rtorres@capcc.edu
Capital	Treman	Roger	rtreman@capcc.edu
Washington	Viviani	Joseph	lviviani@capcc.edu
Washington	West	Paul	pwest@capcc.edu

Save and Close a Database

- **When you close an Access table, any changes made to the records are saved automatically**
- **You will be prompted to save changes to design of the table or the layout of Datasheet view**

Save and Close a Database

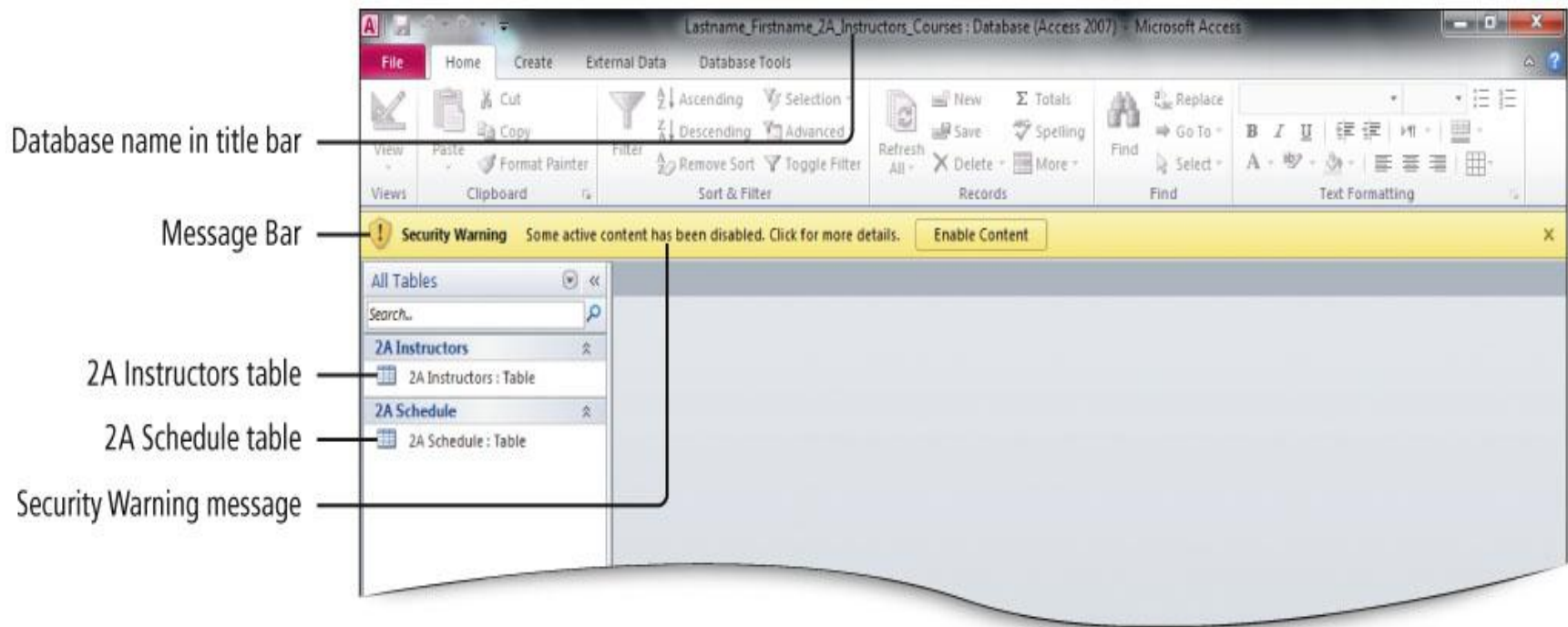


Open an Existing Database

- **You can open a database file and save it with a new name**
- **Message Bar**
 - The area below the Ribbon that displays information such as security alerts
 - Enable Content button: Click when you know the database is safe to use on your computer
- **Access Trust Center**
 - Area of Access where you can view the security and privacy settings for your Access installation

Open an Existing Database

- Security warnings displayed on Message Bar



Create Table Relationships

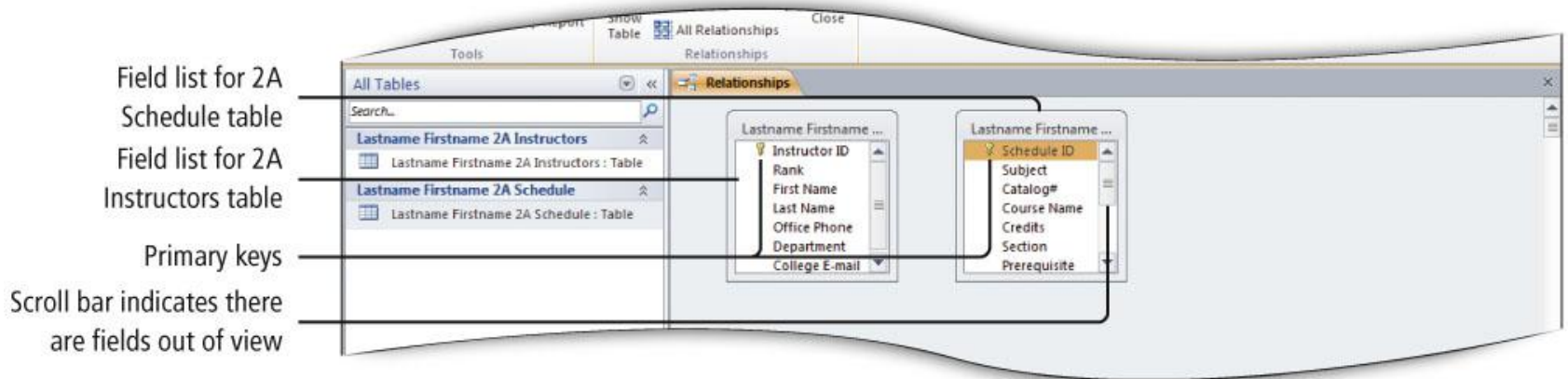
- **Access databases are relational databases; they connect to other tables through common fields**
 - Common fields are fields that contain the same data in more than one table
- **After you have a table for each subject in your database, you must provide a way to connect the data in the tables when you need meaningful information**

Create Table Relationships

- **To connect the data in your tables, create common fields in related tables, and then define table relationships**
 - A relationship is an association established between two tables based on common fields
 - Once a relationship is established, you can create a query, a form, or a report that displays information from more than one table

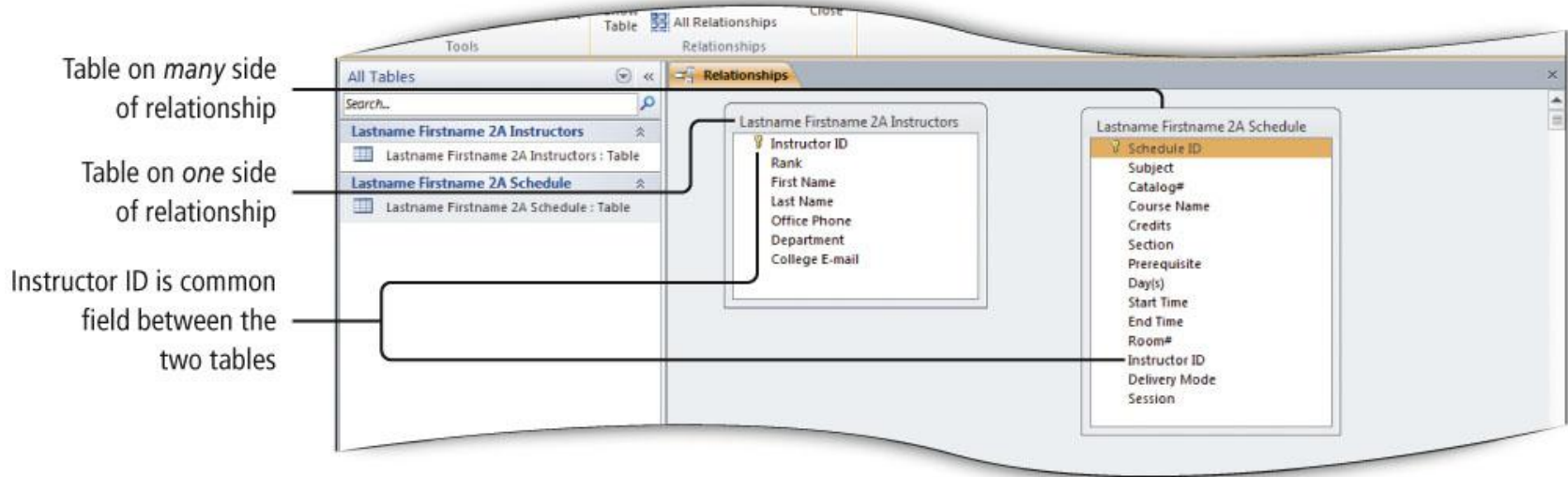
Create Table Relationships

- Add tables to the Relationships window to show a field list, a list of field names in a table



Create Table Relationships

- Both tables include a common field



Create Table Relationships

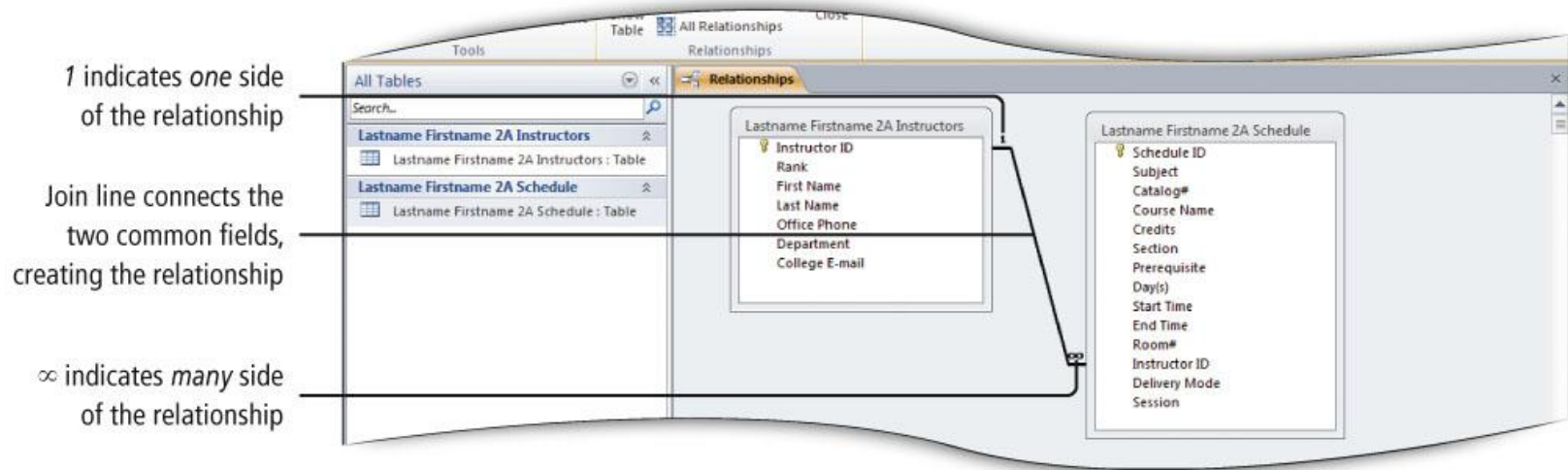
- **A one-to-many relationship is the most common**
 - Example: Because one instructor can teach many different courses, one Instructor ID number can be present many times in the 13B Schedule table
 - This relationship between each instructor and the course is known as a one-to-many relationship

Create Table Relationships

- **Dragging:** Creates the one-to-many relationship
- **Foreign key:** Field in the related table that connects to the primary key in another table
- **The *one* side:** Typically the primary key
- **Referential integrity:** Set of rules to ensure that the data between related tables is valid

Create Table Relationships

- **Join line:** The line joining two tables
 - Displays between the two tables



Sort Records in a Table

- **Sorting: Process of arranging data in a specific order based on the value in a field**
 - Initially, records display in the order entered into the table
 - For a primary key field, records are displayed in order based on that field

Sort Records in a Table

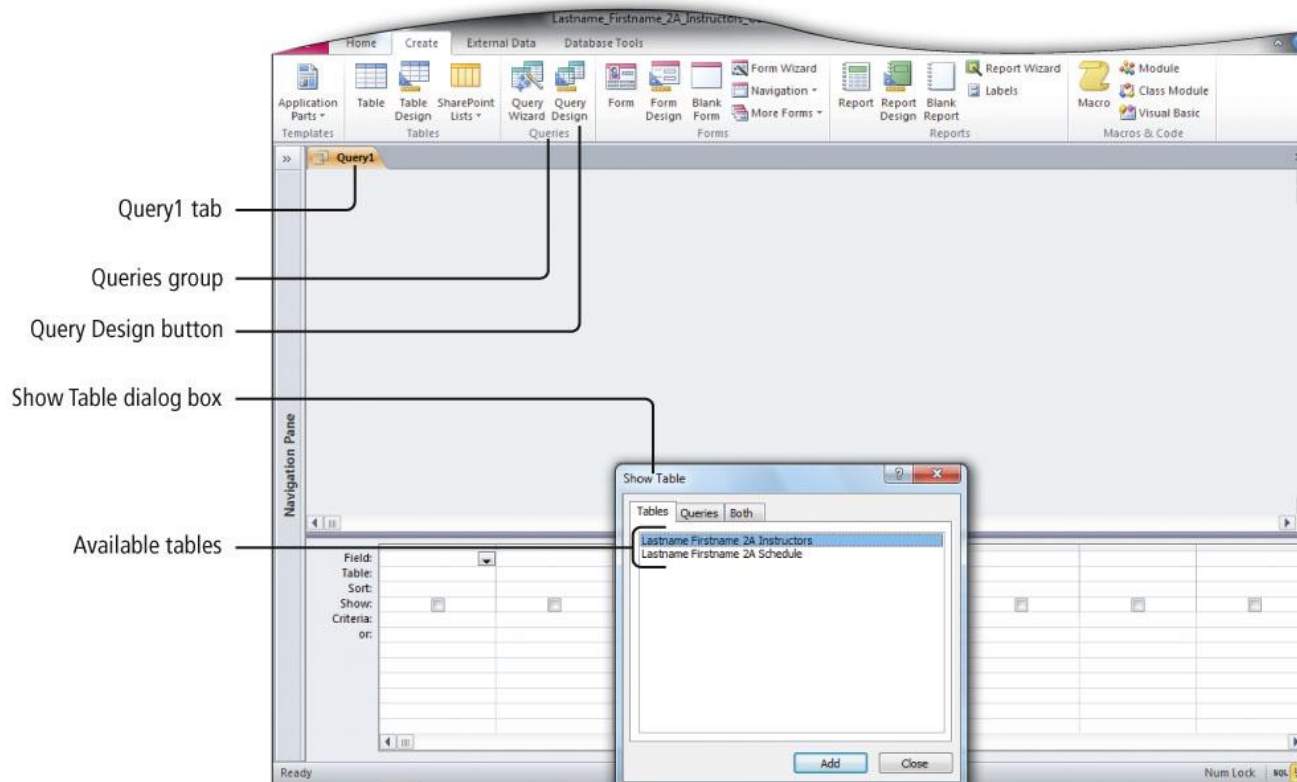
- **Sort records on two or more fields**
 - Outermost sort field: First level of sorting
 - Innermost sort field: Second level of sorting
 - For example, you might want to sort first by the Last Name field (outermost sort field), and then by the First Name field (innermost sort field)
- **Sorting records**
 - Ascending order sorts text alphabetically (from A to Z) and sorts numbers from the lowest number to the highest number
 - Descending order sorts text in reverse

Create a Query in Design View

- **Query**
 - Answers a question
 - Creates a subset of records, according to your specifications
- **Select query**
 - Database object that retrieves (selects) specific data from one or more tables
- **Query Design view:**
 - Creates complex queries

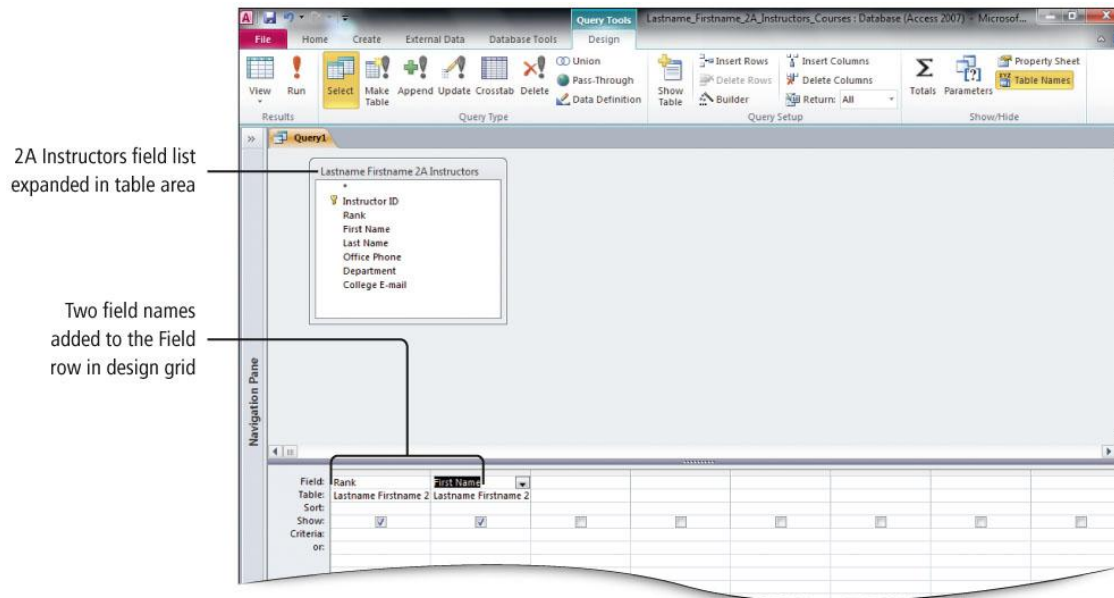
Create a Query in Design View

- **Data source: Table or tables where a query selects its data**



Create a Query in Design View

- **The Query window has two parts**
 - Table area (upper area): Displays field lists for tables used in the query
 - Design grid (lower area): Displays design for the query



Create a Query in Design View

- Run a query to display the results after you create it

Five fields specified in design grid

Records displayed in rows

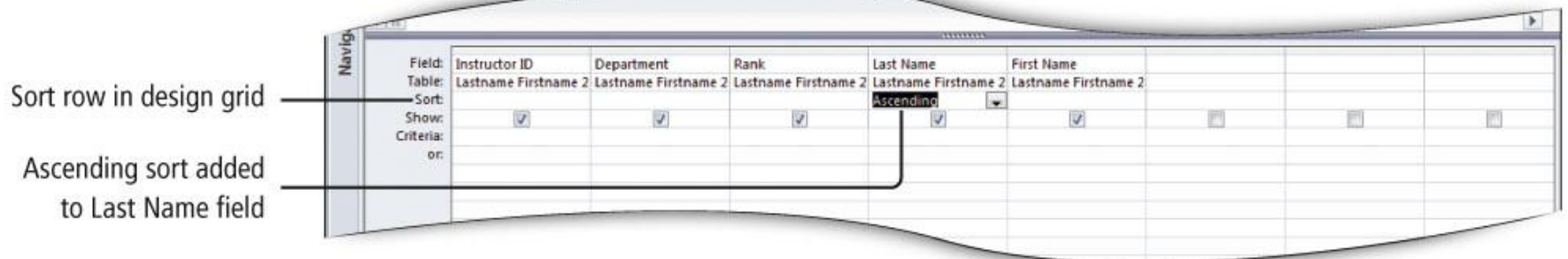
Rank	First Name	Last Name	Office Phone	Department
Associate Professor	Deborah	Fresch	(571) 555-1100	LGL
Professor	Jean	Woodward	(571) 555-1102	HRI
Professor	Christian	Widimer	(571) 555-5123	ACC
Associate Professor	Lucy	LePorter	(571) 555-5208	ACC
Professor	Emanuel	Hamme	(571) 555-5159	BUS
Professor	Valerie	Jonese	(571) 555-5209	BUS
Professor	Eduardo	Dyer	(571) 555-5213	BUS
Associate Professor	Cynthia	Pedigree	(571) 555-5148	LGL
Assistant Professor	Claudette	Macon	(571) 555-5132	BUS
Instructor	Kevin	Elkington	(571) 555-1104	MKT
Professor	Susanne	Carter	(571) 555-1048	IST
Assistant Prof			(571) 555-5133	HRI

Create a New Query from an Existing Query

- **Modify an existing query, save with a new name, use a new design**
 - An existing query saves time, if your new query uses all or some of the same fields and conditions in an existing query

Sort Query Results

- Sort results of a query in ascending or descending order in either Datasheet view or Design view



Sort Query Results

- **Design view: Results displayed in a specified sort order, or for sorted results in a report**
 - Fields with a Sort designation are sorted from left to right
 - Sorted field on left becomes outermost sort field
 - Sorted field on right becomes innermost sort field
 - Sorted results not what you intended? Be sure fields are displayed from left to right according to the groupings desired

Sort Query Results

- Design view

Department names sorted in descending order

Within each Department, Last Names sorted in ascending order

Within each Last Name, First Names sorted in ascending order

Instructor ID	Department	Rank	Last Name	First Name
2543991	IST	Professor	Noehle	Gary
2388652	IST	Professor	Perezo	Kimberlee
2643912	IST	Associate Professor	Steagallor	Bryce
2912338	IST	Professor	Tinafossey	Gregory
2278662	IST	Professor	Tinnarro	Louis
5012877	HRI	Professor	Blanche	Barbara
2109876	HRI	Assistant Professor	Kaniski	Peter
1228964	HRI	Professor	Woodward	Jean
1578523	BUS	Professor	Dyer	Eduardo
1566543	BUS	Professor	Hamme	Emanuel
1578223	BUS	Professor	Jonese	Valerie
1922377	BUS	Assistant Professor	Macon	Claudette
3233995	BUS	Associate Professor	Saidlachek	Brenda
6145288	AST	Professor	Clarke	Ivey
7222244	AST	Professor	Warrenton	Jacqui
5087223	ACC	Professor	Heart	Roberto
2584901	ACC	Associate Professor	Birdsong	Cindy
3152998	ACC	Associate Professor	Bohrman	Maryanne
1478893	ACC	Associate Professor	LePorter	Lucy
1252234	ACC	Professor	Widimer	Christian
3102555	ACC	Assistant Professor	Widimer	Deborah
9999999			Staff	

Specify Criteria in a Query

- **Criteria**
 - Conditions that identify the specific records you are looking for
 - Enable you to ask specific questions to get specific results
- **Queries locate information based on criteria**

Specify Criteria in a Query

- **Locate records where data is missing**
 - Missing records can be located using Is Null—empty—as the criteria in a field
 - Is Not Null: Displays only records where a value has been entered as the criteria

Ascending sort in Subject and Catalog# fields

Is Null criteria in Credits field

Field:	Subject	Catalog#	Section	Course Name	Credits			
Table:	LastName Firstname 1	LastName Firstname 1	LastName Firstname 1	LastName Firstname 1	LastName Firstname 1			
Sort:	Ascending	Ascending						
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:					Is Null			
or:								

Specify Numeric Criteria in a Query

- **Numeric data can be set as fields**
 - When designing a table, use appropriate data type for fields that will contain numbers, currency, or dates, so mathematical calculations can be performed

Numeric criteria—no quotation marks

Sort in ascending order by *Sport*

The screenshot shows a Microsoft Access query design grid. The grid has four columns: Scholarship Name, Sport, and Amount. The Amount field is highlighted with a box. The criteria for the Amount field is set to 300. The Sport field is sorted in ascending order. The grid is shown in a window titled 'Scholarship'.

Field:	Scholarship Name	Sport	Amount
Table:	Lastname Firstname 2	Lastname Firstname 2	Lastname Firstname 2
Sort:		Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			300
or:			

Specify Numeric Criteria in a Query

- **Comparison operators: Symbols that evaluate each field value**
 - Can determine if it is the same (=), greater than (>), less than (<), or in between a range of values as specified by the criteria
 - Equal (=) is assumed, if no comparison operator is specified

Specify Numeric Criteria in a Query

- **Between . . . And operator: A comparison operator that looks for values within a range**

Dates end with 9/30/2016

Award Date field added to design grid and column width increased

Dates begin with 8/1/2016

Criteria for Amount field deleted

Field:	Scholarship Name	Sport	Amount	Award Date
Table:	Lastname Firstname 2	Lastname Firstname 2	Lastname Firstname 2	Lastname Firstname 2B Scholarships Awarded
Sort:		Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				Between #8/1/2016# And #9/30/2016#
or:				

Use Compound Criteria

- **Compound criteria: Used to specify more than one condition—criteria—in a query**
 - Compound criteria use AND and OR logical operators
 - AND condition requires records to meet all parts of the specified criteria
 - OR condition specifies multiple criteria for a single field, or multiple criteria for different fields and displays records that meet any of the conditions
 - Logical operators enable entry of criteria for the same field or different fields

Use Compound Criteria

- Alternative way to use OR compound operator

OR condition for two criteria in the same field

AND condition for Amount field

Field:	Scholarship Name	Sport	Amount	Award Date				
Table:	LastName Firstname 2	LastName Firstname 2B Scholarships Awarded	LastName Firstname 2	LastName Firstname 2				
Sort:								
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:		"swimming" Or "baseball"	>400					
or:								

Create a Query Based on More Than One Table

- **Relational database: Retrieve information from more than one table**
 - Tables are joined by relating the primary key field in one table to a foreign key field in another
 - Creates a relationship
 - Enables inclusion of data from more than one table in a query
 - When extracting data from multiple tables, the information on the Table row is helpful, especially when different tables include the same field names

Use Wildcards in a Query

- **Wildcard characters:** Serve as a placeholder for one or more unknown characters in the criteria
- **Use wildcard characters in place of the characters**
 - Asterisk (*) is a placeholder to match one or more characters
 - Question mark (?) is a wildcard that is used to search for unknown single characters

Use Wildcards in a Query

- Wildcard placement

Three variations of
* wildcard placement

The screenshot shows a Microsoft Access query design grid. The grid has columns for 'Field', 'Table', 'Sort', 'Show', and 'Criteria'. The first three columns are populated with 'First Name', 'Last Name', and 'Awarding Organization' from the 'Lastname Firstname 2' table. The 'Sort' for 'Last Name' is set to 'Ascending'. The 'Show' checkboxes are checked for all three fields. The 'Criteria' row shows three variations of wildcard placement: 'Like "rotary*"', 'Like "*"country club"', and 'Like "*"foundation*'. A bracket groups these three criteria, and a line from the text 'Three variations of * wildcard placement' points to this group.

Field:	First Name	Last Name	Awarding Organization						
Table:	Lastname Firstname 2	Lastname Firstname 2	Lastname Firstname 2						
Sort:		Ascending							
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:			Like "rotary*"						
OR:			Like "*"country club"						
			Like "*"foundation*"						

Use Calculated Fields in a Query

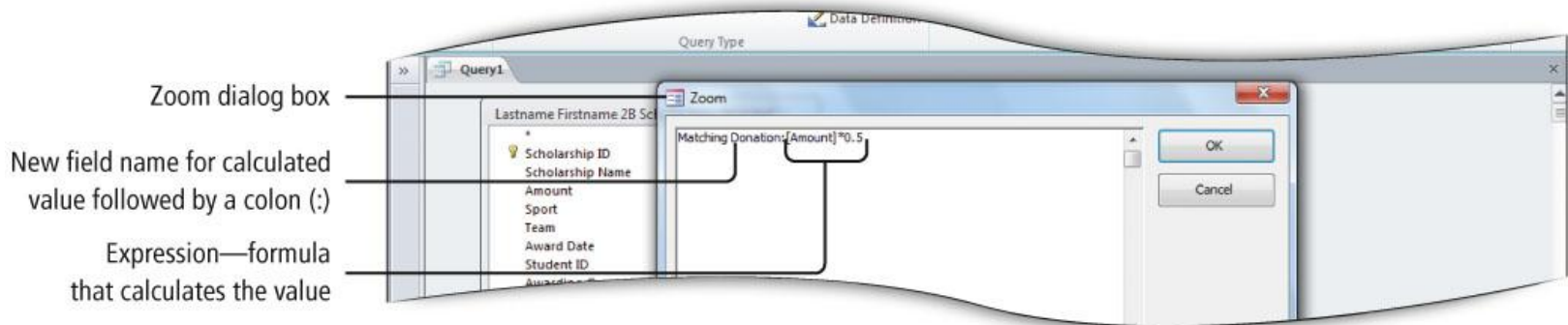
- **Calculated field: Calculated values created from queries are stored here**
- **A calculated field stores the value of a mathematical operation**
 - Multiply two fields together without having to include a specific field for this amount in the table, which reduces the size of the database and provides more flexibility

Use Calculated Fields in a Query

- **Creating a calculated field in a query requires two steps**
 - Name the field that will store the calculated values
 - Write the expression—the formula—that performs the calculation
- **Each field name used in the calculation must be enclosed within its own pair of square brackets**

Use Calculated Fields in a Query

- **Zoom dialog box: More working space enables you to see the entire calculation**



Use Calculated Fields in a Query

- **Property Sheet: Customize fields in a query**

The screenshot shows the Microsoft Access interface in Query Design View. The main window displays the 'Query1' design grid with the following fields:

Field Name	Table	Field Name
*	Lastname Firstname 2B Scholarships Awarded	*
Scholarship ID	Scholarship ID	Scholarship ID
Scholarship Name	Scholarship Name	Scholarship Name
Amount	Amount	Amount
Sport	Sport	Sport
Team	Team	Team
Award Date	Award Date	Award Date
Student ID	Student ID	Student ID
Awarding Organization	Awarding Organization	Awarding Organization

The 'Property Sheet' window is open on the right, showing the 'Field Properties' for the selected field. The 'Lookup' tab is active, displaying a list of numeric formats:

Format
General Number
Currency
Euro
Fixed
Standard
Percent
Scientific

Annotations on the left side of the screenshot point to specific elements:

- Property Sheet for Matching Donation field
- Format arrow
- List of formats for numeric field

Calculate Statistics and Group Data in a Query

- **Perform statistical calculations on a group of records**
- **Aggregate functions: Calculations performed on a group of records**
 - Include only the field summarized in the query, so that the aggregate function (sum, average, minimum, maximum, etc.) is applied to that single field
 - Can also be used to calculate totals by groups of data

Calculate Statistics and Group Data in a Query

Totals button in the Show/Hide group

Total row added to the design grid

List of aggregate functions

Navigation Pane

Field: Amount
Table: Lastname Firstname 2
Total: Group By
Sort: Group By
Show:
Criteria:
or:

Sum
Avg
Min
Max
Count
StDev
Var
First
Last
Expression
Where

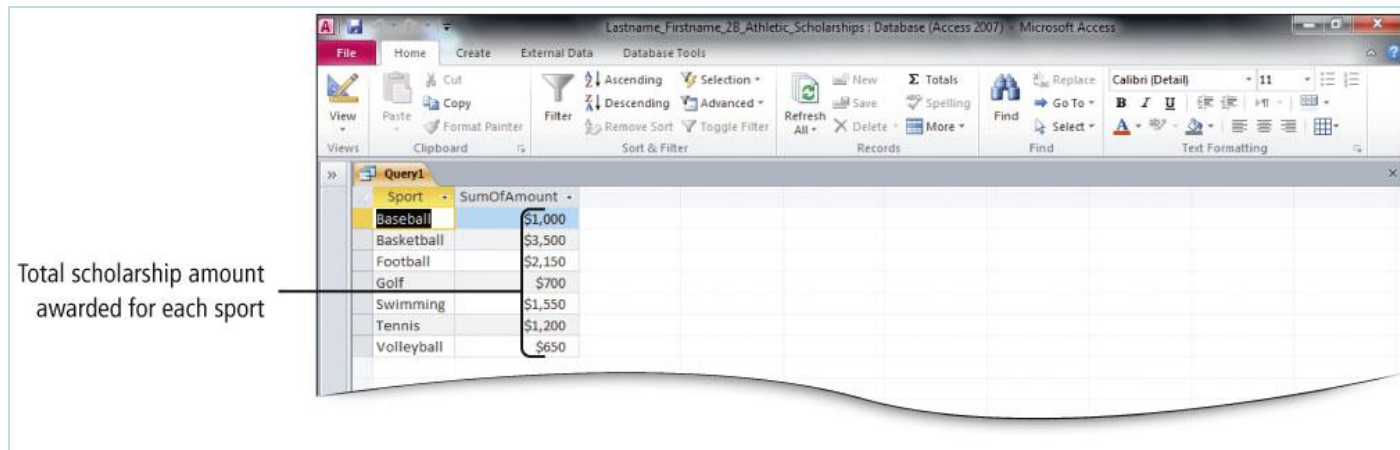
Ready Num Lock

Calculate Statistics and Group Data in a Query

Aggregate Functions	
Function Name	What It Does
Sum	Totals the values in a field
Avg	Averages the values in a field
Min	Locates the smallest value in a field
Max	Locates the largest value in a field
Count	Counts the number of records in a field
StDev	Calculates the Standard Deviation on the values in a field
Var	Calculates the Variance on the values in a field
First	Displays the First value in a field
Last	Displays the Last value in a field
Expression	Creates a calculated field that includes an aggregate function
Where	Limits records to those that match a condition specified in the Criteria row

Calculate Statistics and Group Data in a Query

- Using aggregate functions in a query



The screenshot shows the Microsoft Access interface with a query named 'Query1' displayed in Datasheet View. The query results are as follows:

Sport	SumOfAmount
Baseball	\$1,000
Basketball	\$3,500
Football	\$2,150
Golf	\$700
Swimming	\$1,550
Tennis	\$1,200
Volleyball	\$650

Total scholarship amount awarded for each sport

Create a Crosstab Query

- **A crosstab query**
 - Uses an aggregate function for data that can be grouped by two types of information
 - Displays data in a compact, spreadsheet-like format
 - Always has at least one row heading, one column heading, and one summary field
- **Use a crosstab query to summarize a large amount of data in a small space so that it is easy to read**

Create a Crosstab Query

- Crosstab Query Wizard

Crosstab Query Wizard—
select column heading

Sport names display
as row headings

Sport	Scholarship ID	Scholarship Name	Scholarship Amount
Sport1	TOTAL		
Sport2	TOTAL		
Sport3	TOTAL		
Sport4	TOTAL		

Covered Objectives

- **Identify Good Database Design**
- **Create a Table and Define Fields in a New Database**
- **Change the Structure of Tables and Add a Second Table**
- **Create and Use a Query, Form, and Report**
- **Save and Close a Database**

Covered Objectives

- **Open an Existing Database**
- **Create Table Relationships**
- **Sort Records in a Table**
- **Create a Query in Design View**
- **Create a New Query from an Existing Query**

Covered Objectives

- **Sort Query Results**
- **Specify Criteria in a Query**
- **Specify Numeric Criteria in a Query**
- **Use Compound Criteria**
- **Create a Query Based on More Than One Table**

Covered Objectives

- **Use Wildcards in a Query**
- **Use Calculated Fields in a Query**
- **Calculate Statistics and Group Data in a Query**
- **Create a Crosstab Query**



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