PowerPoint Presentation to Accompany *GO! All In One*

Chapter 13

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

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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**

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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

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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

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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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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

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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

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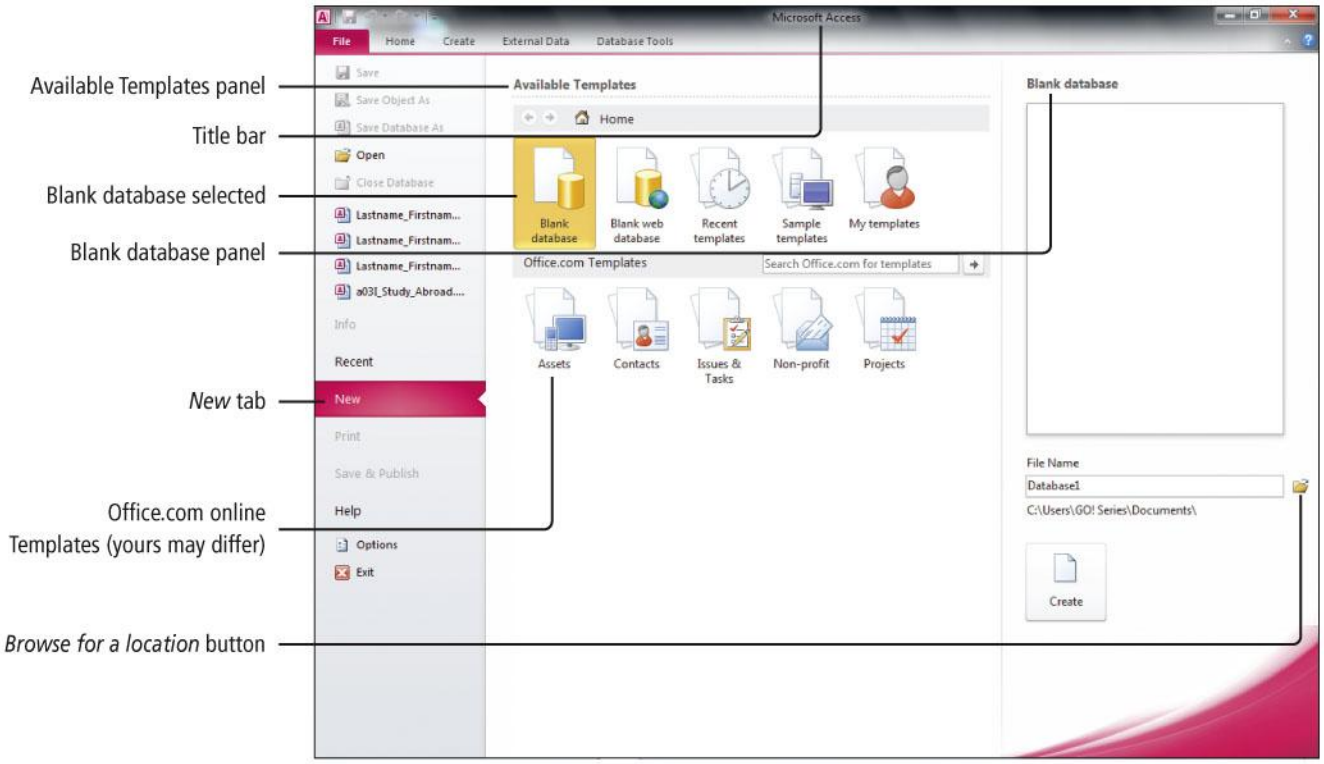
Create a Table and Define Fields in a New Database

- Backstage view



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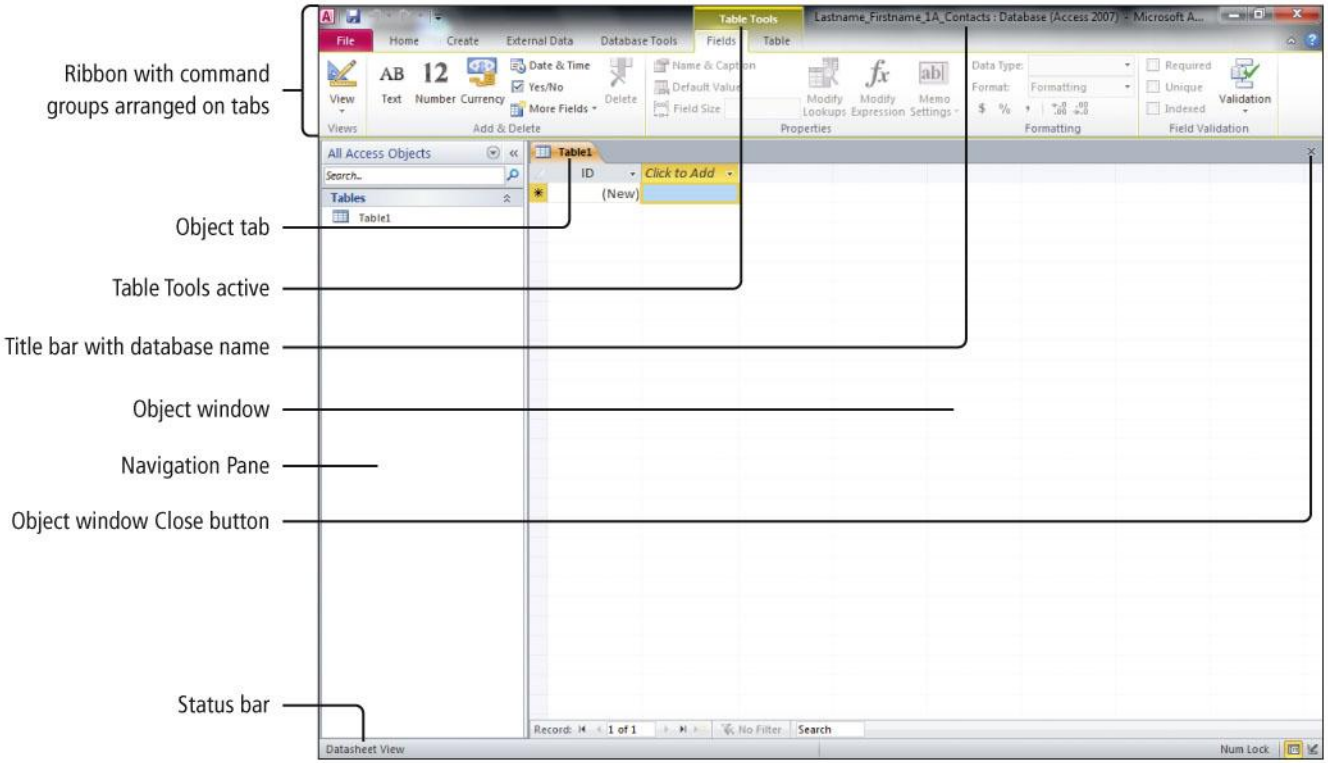
Create a Table and Define Fields in a New Database



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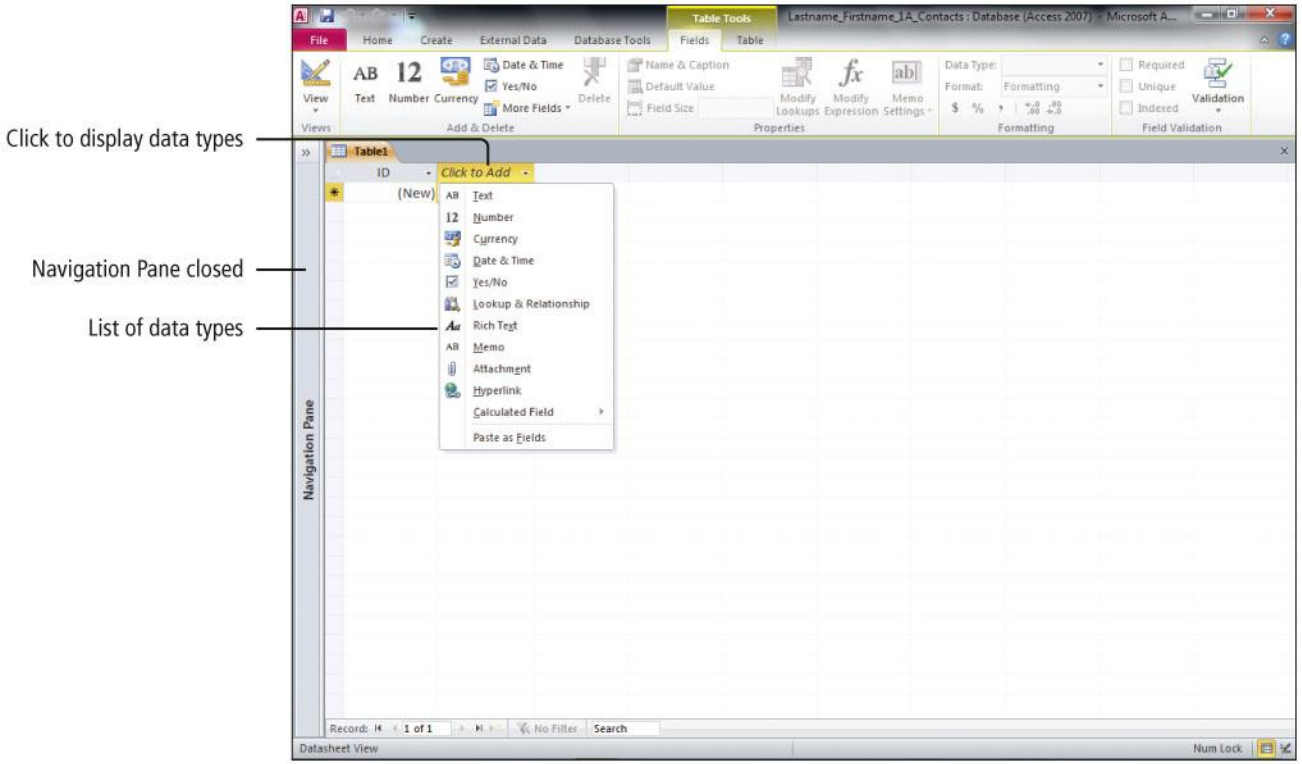
Create a Table and Define Fields in a New Database

- Display data types



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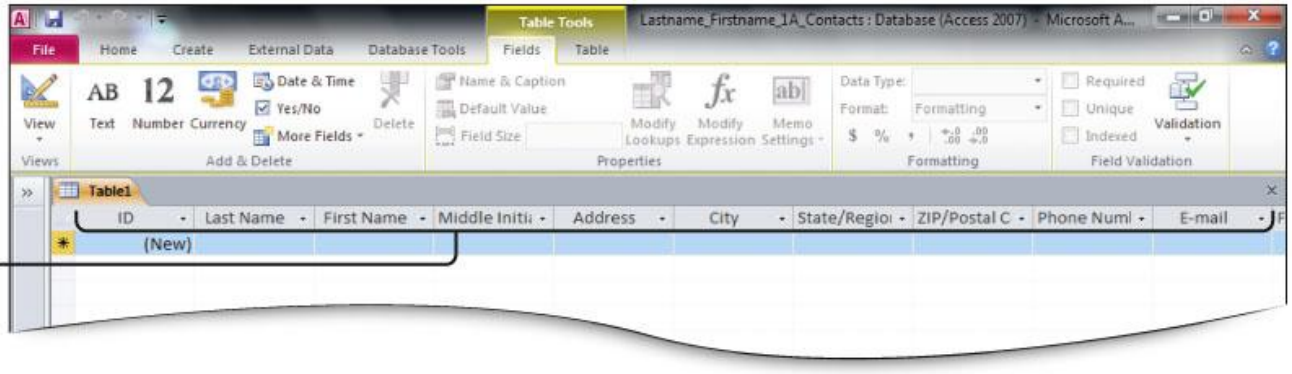
Create a Table and Define Fields in a New Database

- Using the horizontal scroll bar



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

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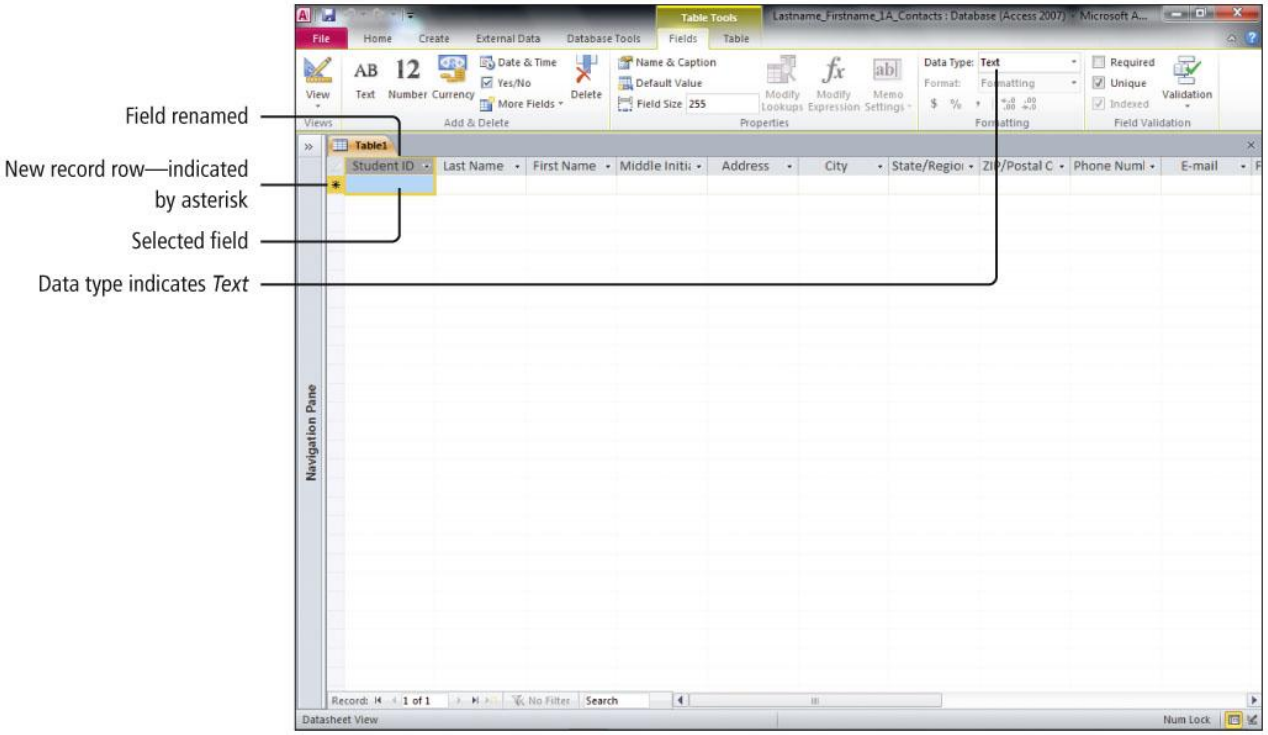
Create a Table and Define Fields in a New Database

- **Renaming fields and changing data types**



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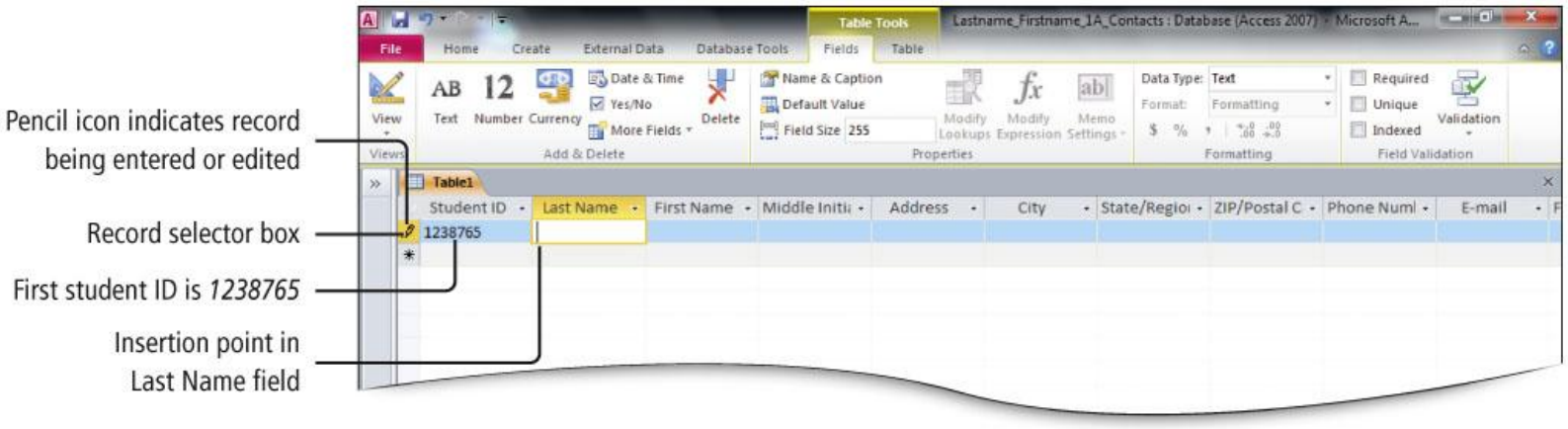
Create a Table and Define Fields in a New Database

- **Adding a record to a table**



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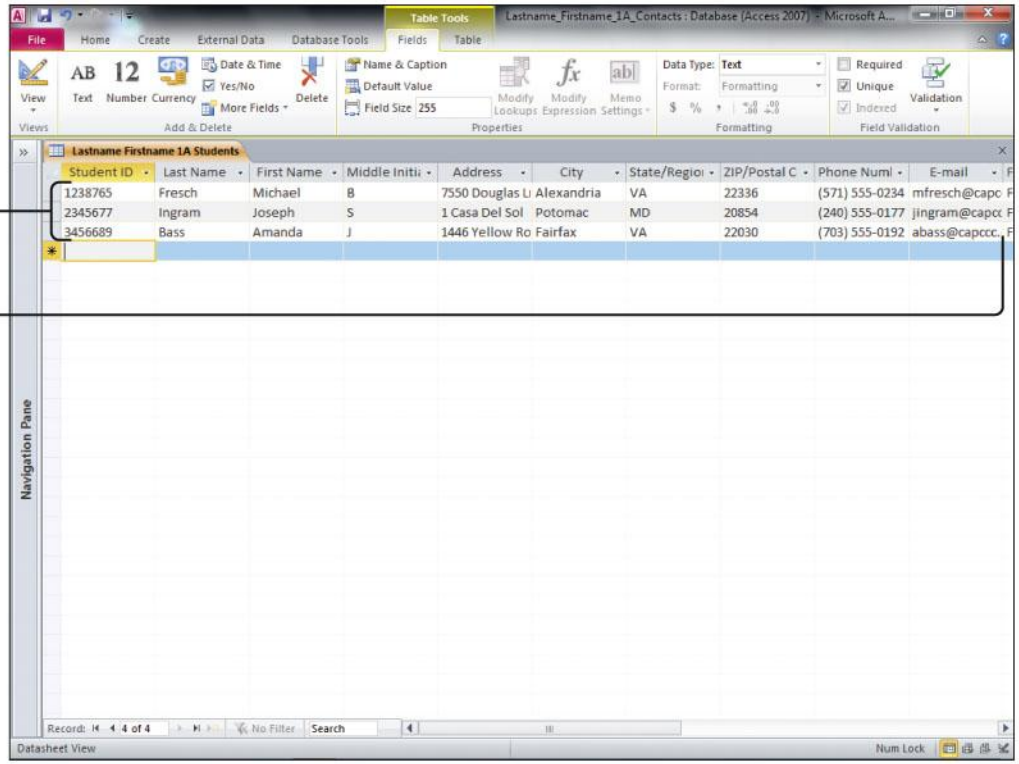
Create a Table and Define Fields in a New Database

- Adding additional records to a table



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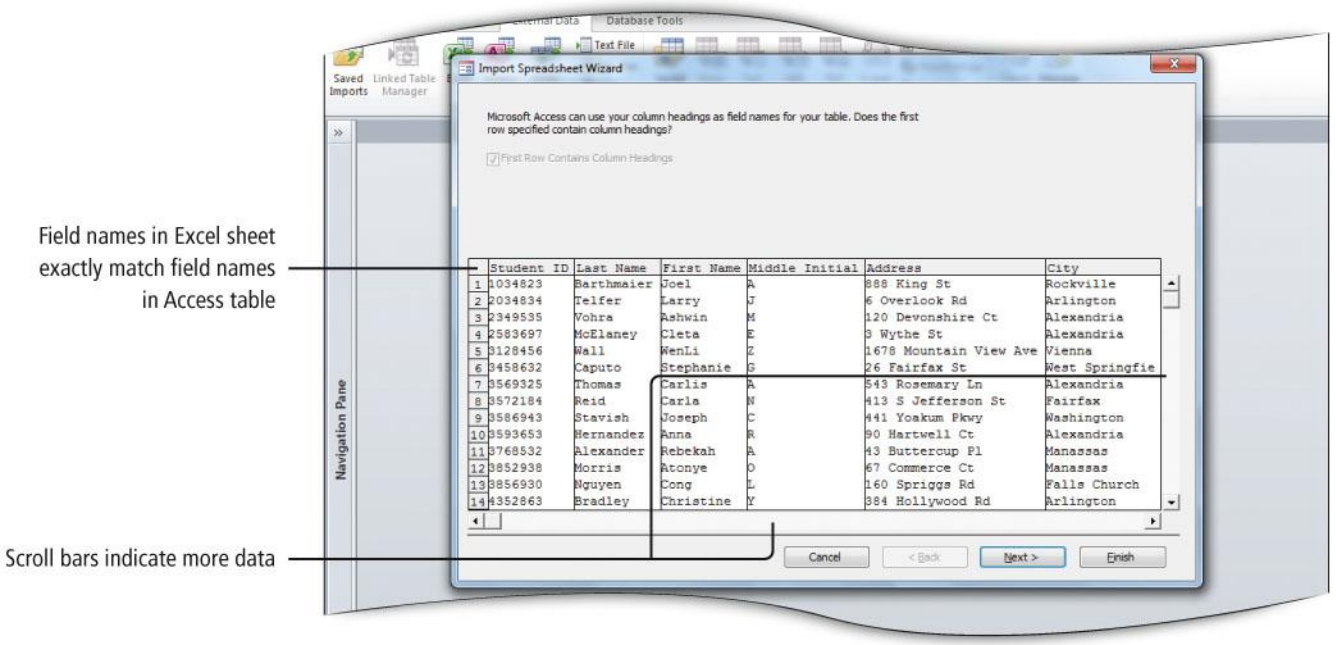
Create a Table and Define Fields in a New Database

- **Importing data to an existing Access table**



	Student ID	Last Name	First Name	Middle Initial	Address	City
1	1034823	Barthmaier	Joel	A	888 King St	Rockville
2	2034834	Telfer	Larry	J	6 Overlook Rd	Arlington
3	2349535	Vohra	Ashwin	M	120 Devonshire Ct	Alexandria
4	2583697	McElaney	Cleta	E	3 Wythe St	Alexandria
5	3128456	Wall	WenLi	Z	1678 Mountain View Ave	Vienna
6	3458632	Caputo	Stephanie	G	26 Fairfax St	West Springfie
7	3569325	Thomas	Carlis	A	543 Rosemary Ln	Alexandria
8	3572184	Reid	Carla	N	413 S Jefferson St	Fairfax
9	3586943	Stavish	Joseph	C	441 Yoakum Pkwy	Washington
10	3593653	Hernandez	Anna	R	90 Hartwell Ct	Alexandria
11	3768532	Alexander	Rebekah	A	43 Buttercup Pl	Manassas
12	3852938	Morris	Atonye	O	67 Commerce Ct	Manassas
13	3856930	Nguyen	Cong	L	160 Spriggs Rd	Falls Church
14	4352863	Bradley	Christine	Y	384 Hollywood Rd	Arlington

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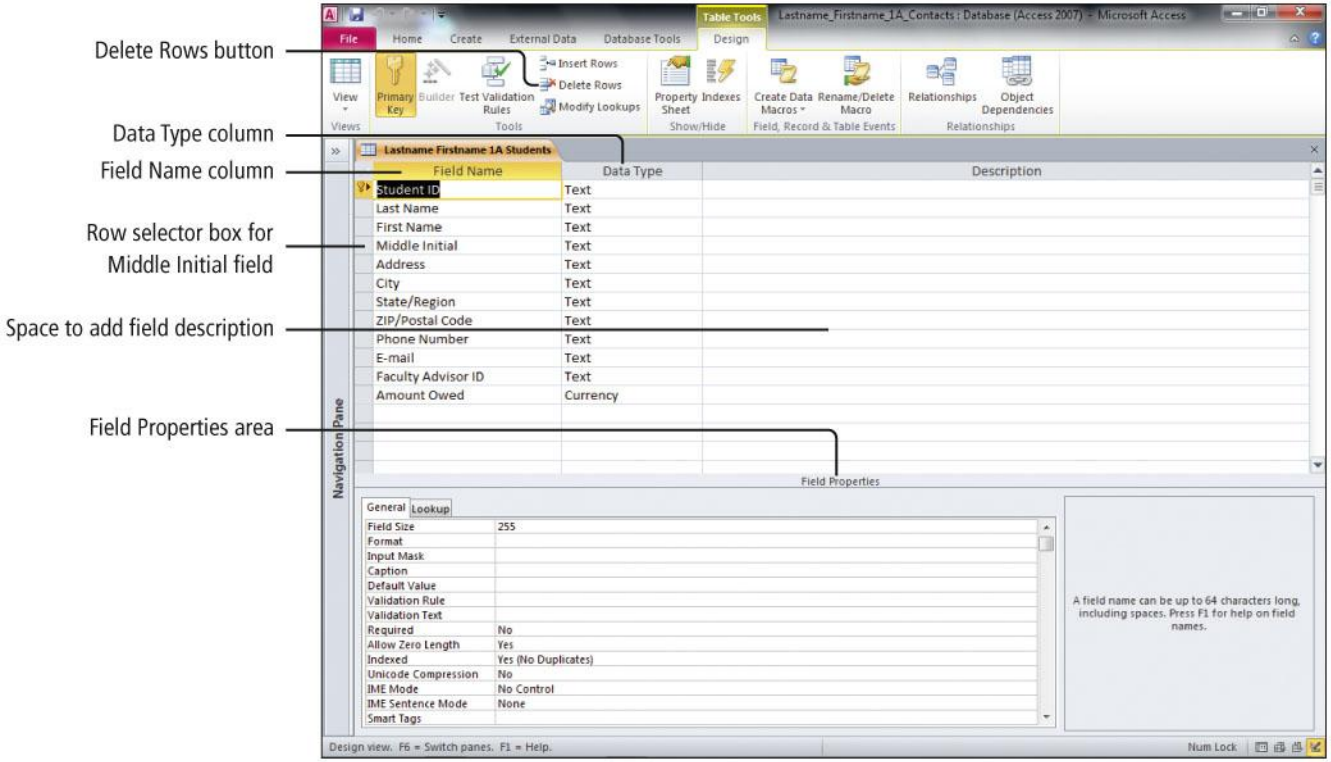
Create a Table and Define Fields in a New Database

- Design View



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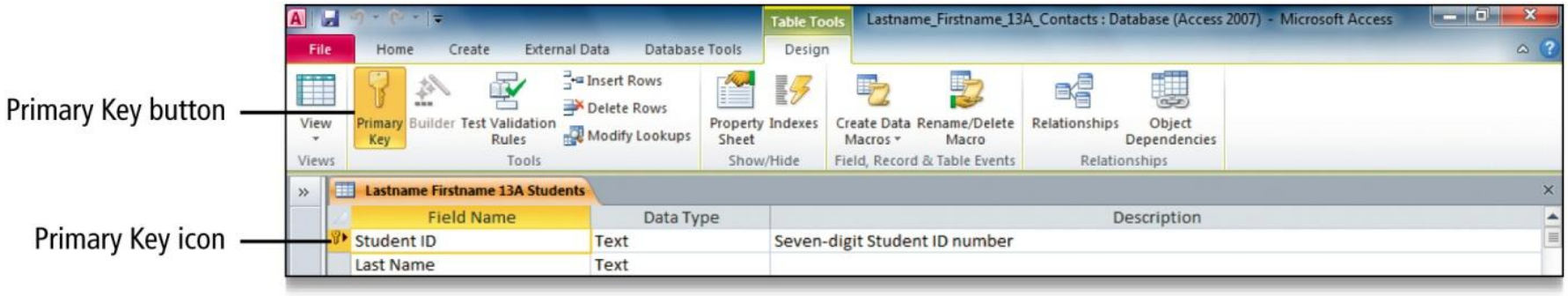
Change the Structure of Tables and Add a Second Table

- **Viewing a primary key in Design view**



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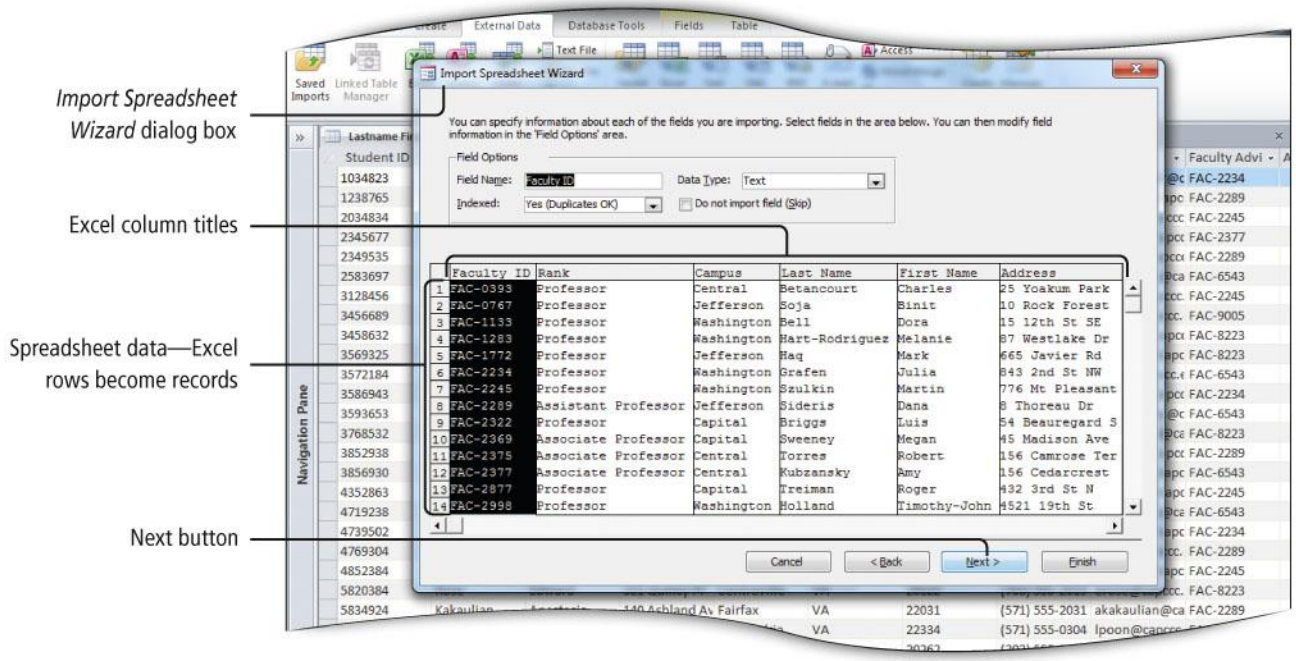
Change the Structure of Tables and Add a Second Table

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



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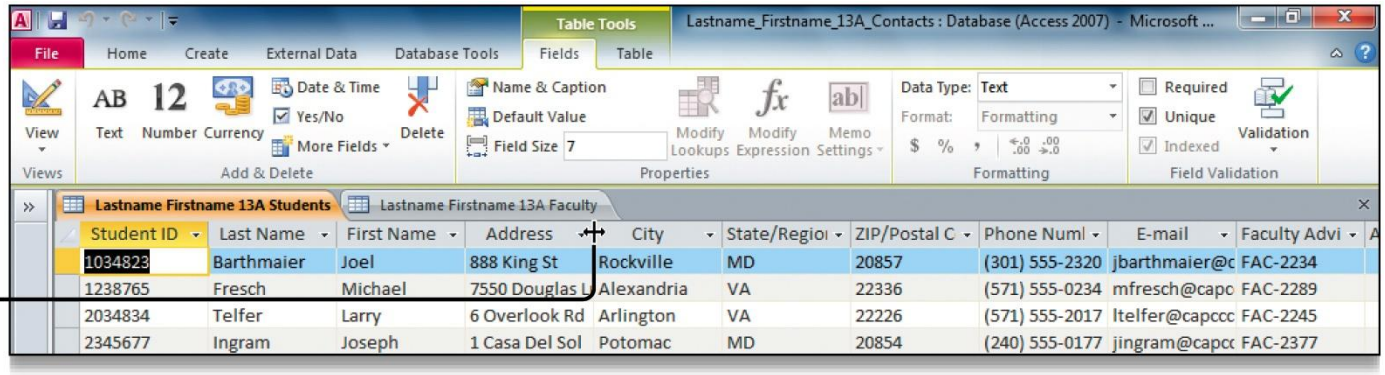
Change the Structure of Tables and Add a Second Table

- **Adjusting column widths**

Pointer positioned on right edge of Address field



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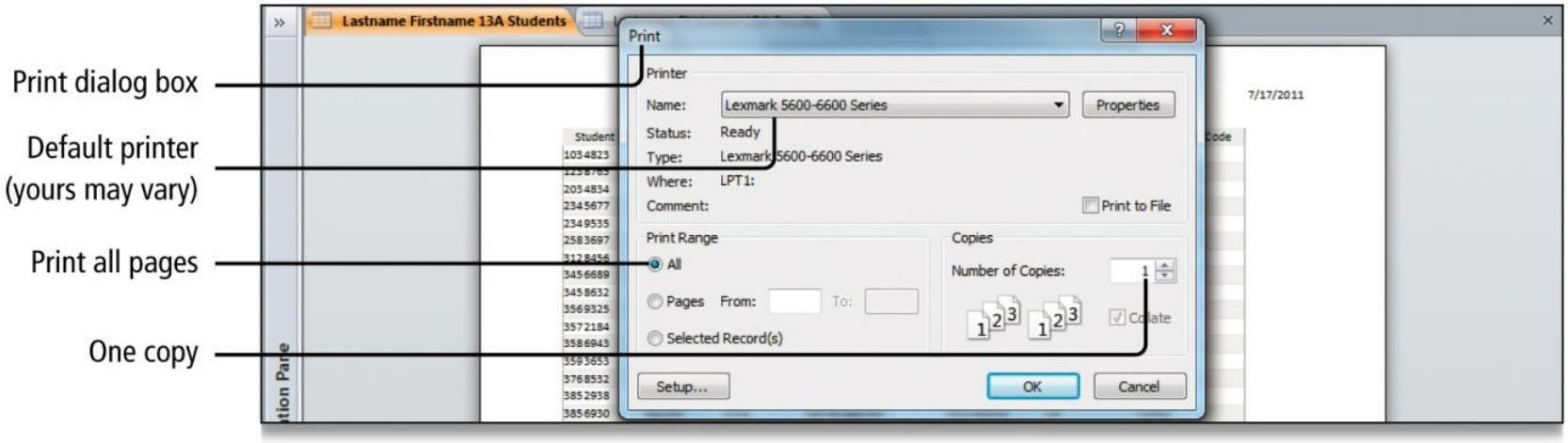
Change the Structure of Tables and Add a Second Table

- **Printing a table**



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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

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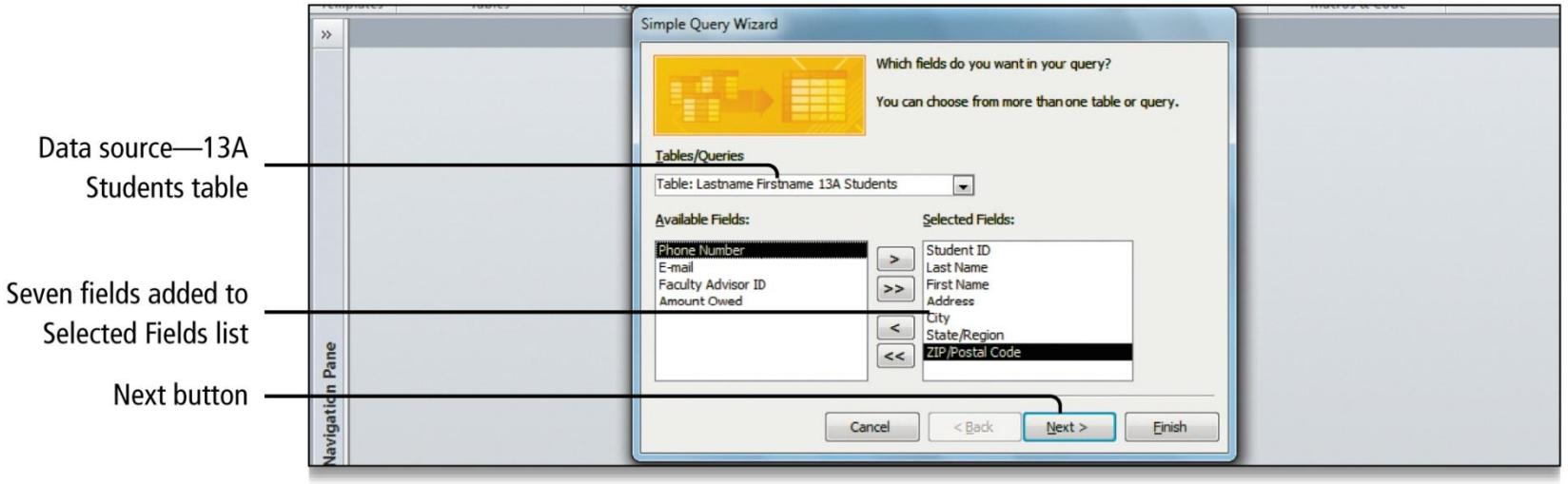
Create and Use a Query, Form, and Report

- Using the Add Field button



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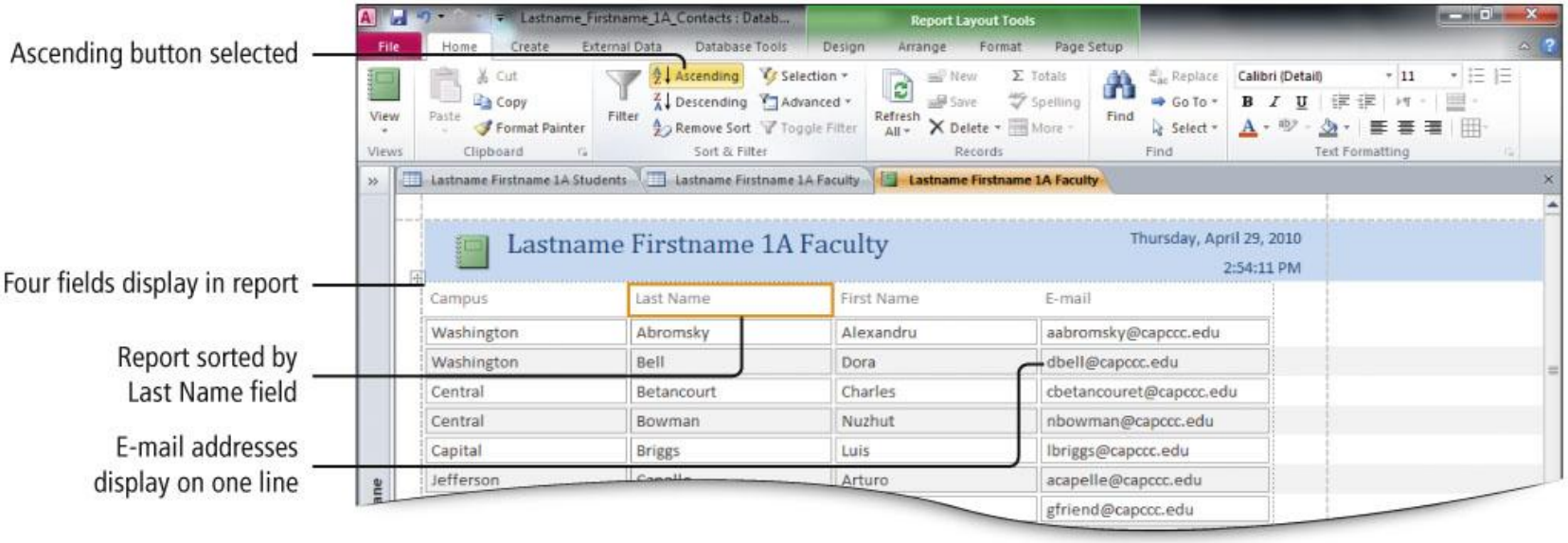
Create and Use a Query, Form, and Report

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



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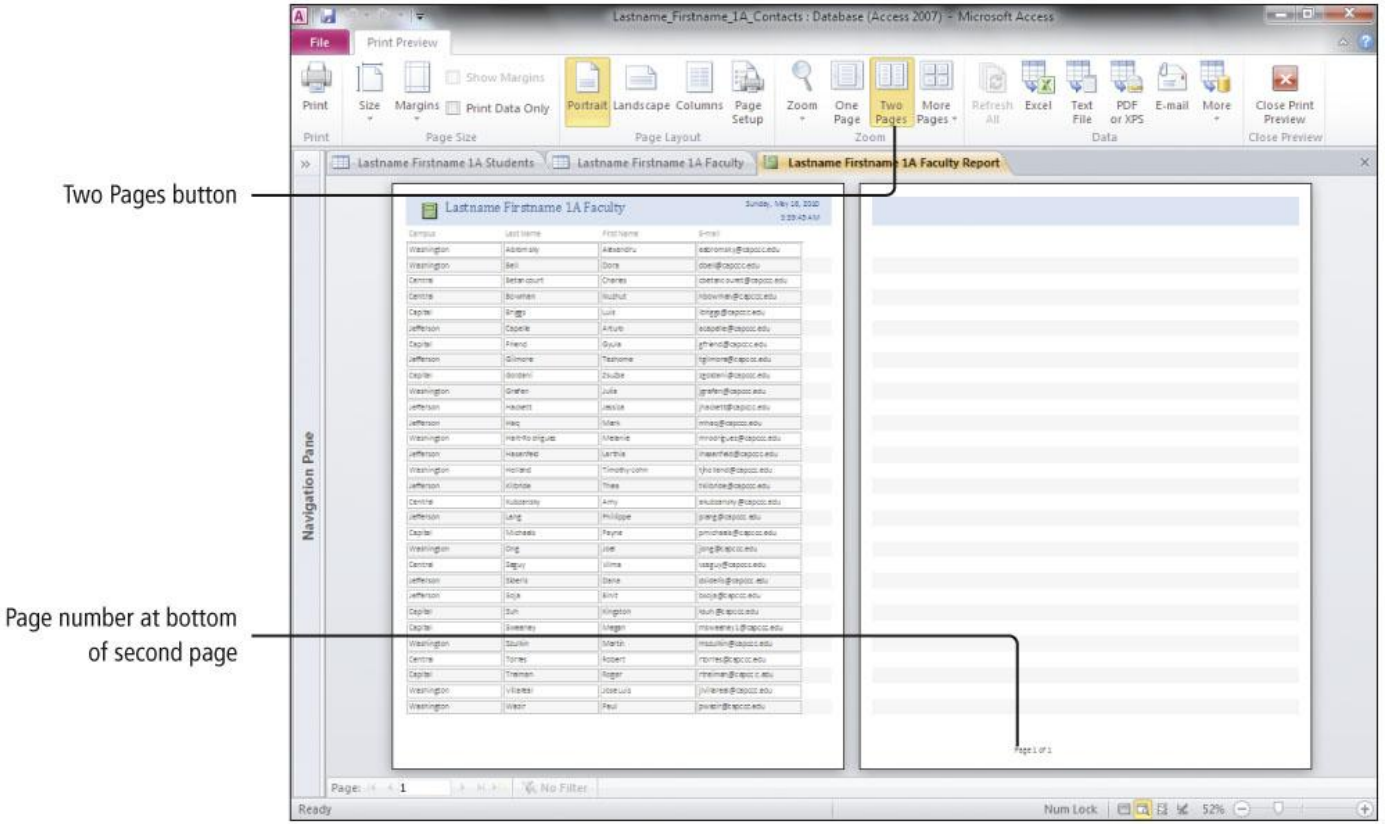
Create and Use a Query, Form, and Report

- Display the Report in Print Preview



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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**

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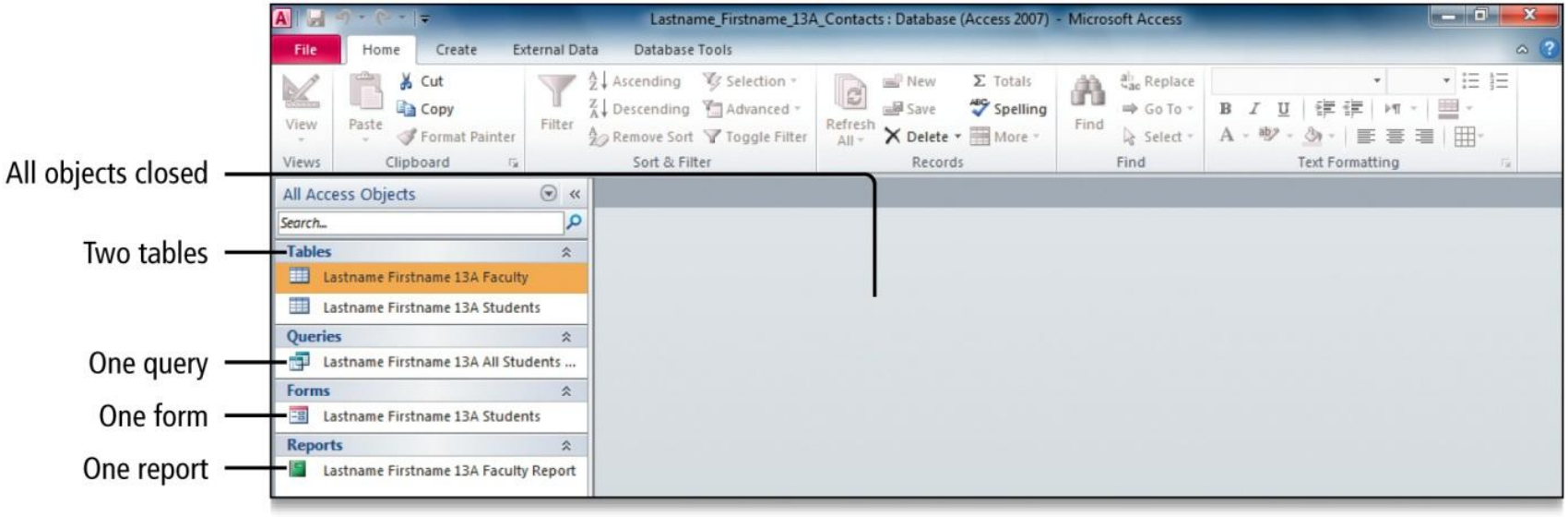
Save and Close a Database



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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

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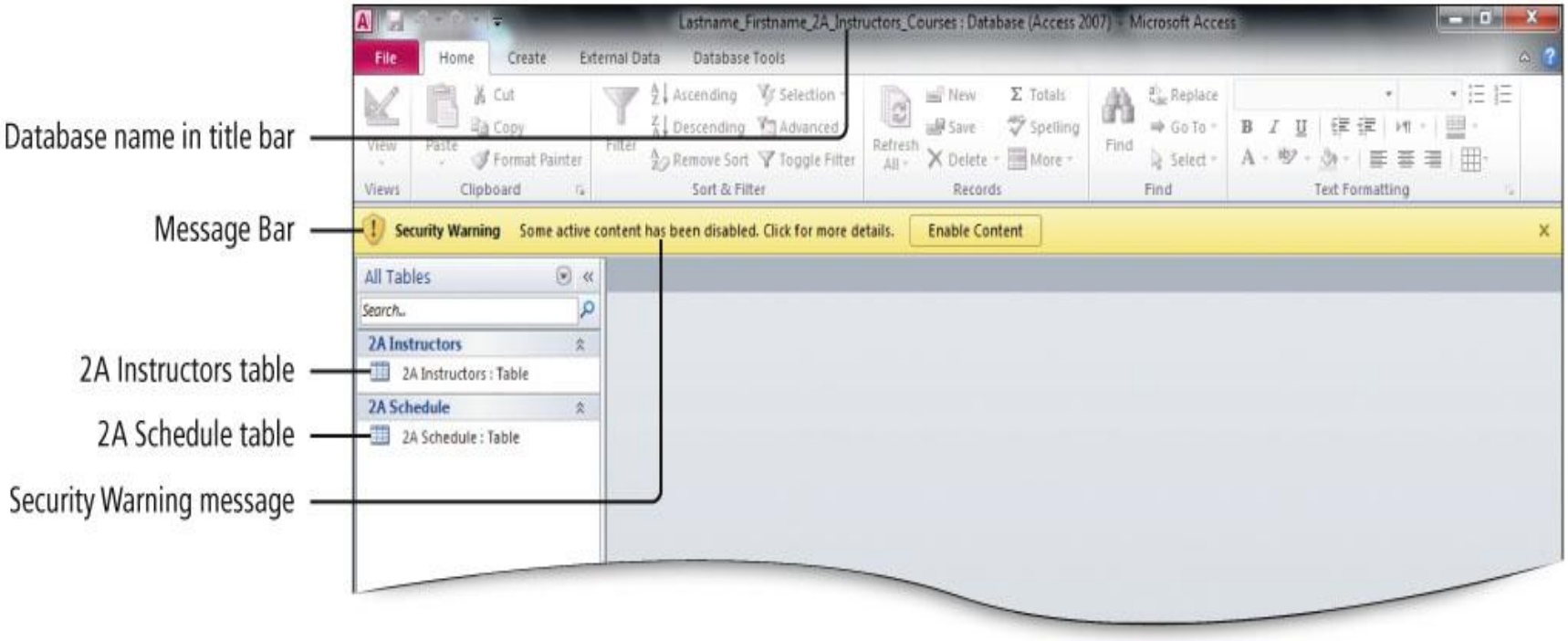
Open an Existing Database

- Security warnings displayed on Message Bar



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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**

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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

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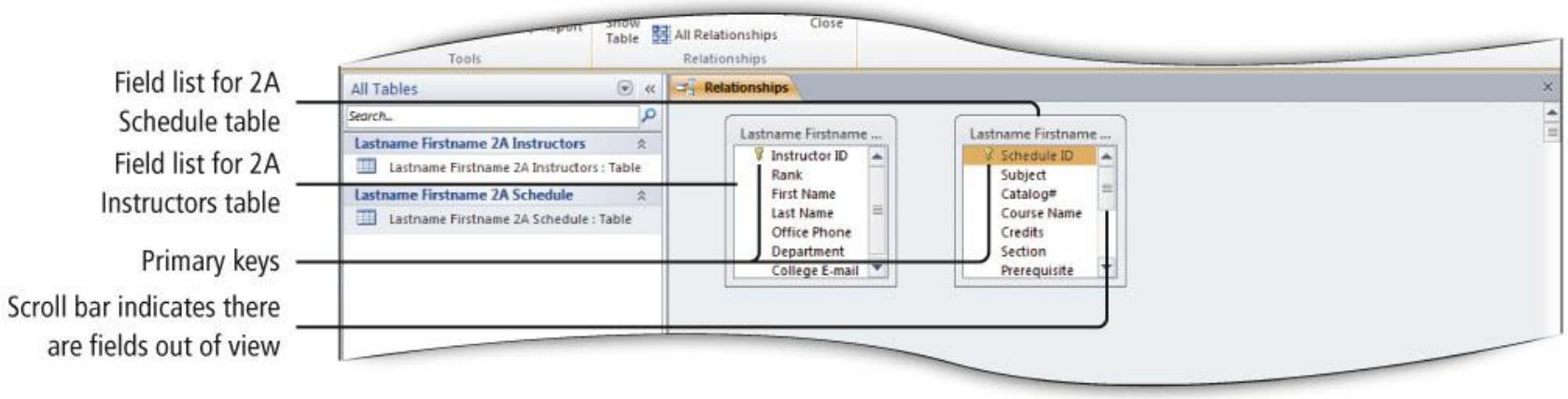
Create Table Relationships

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



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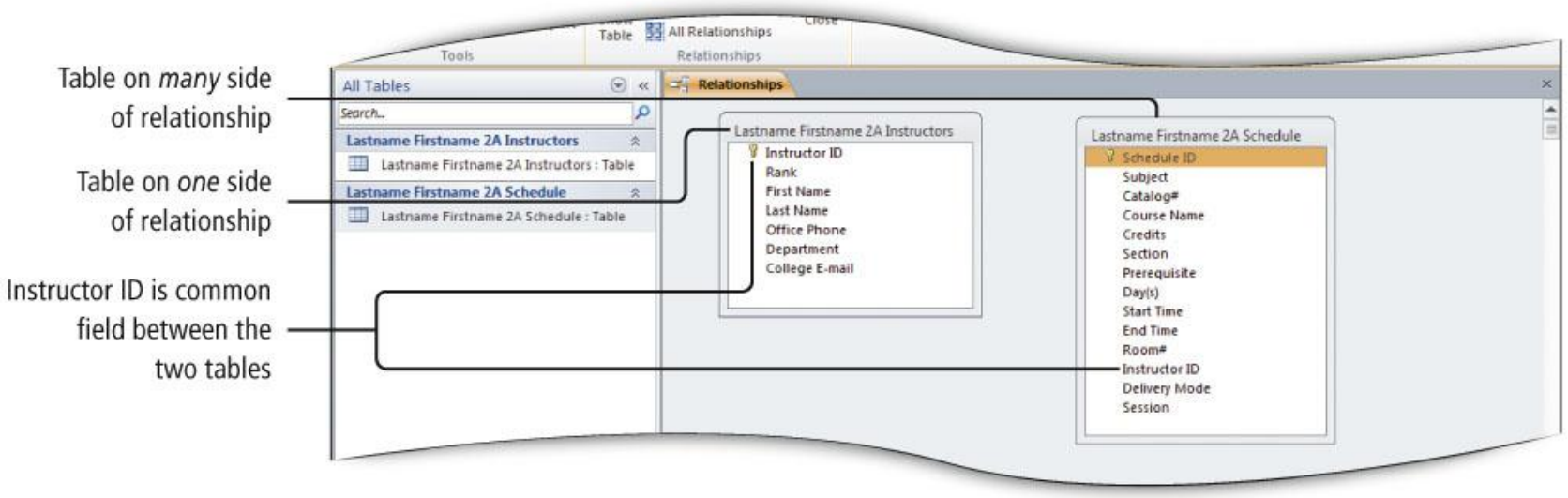
Create Table Relationships

- **Both tables include a common field**



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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

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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**

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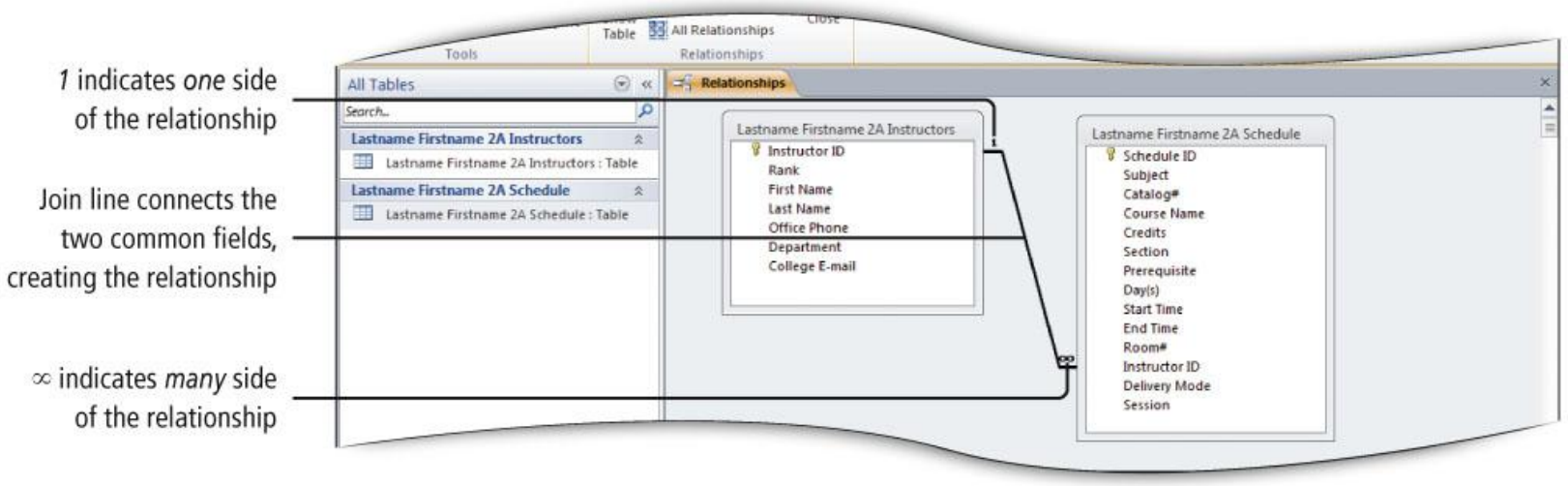
Create Table Relationships

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



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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

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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

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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

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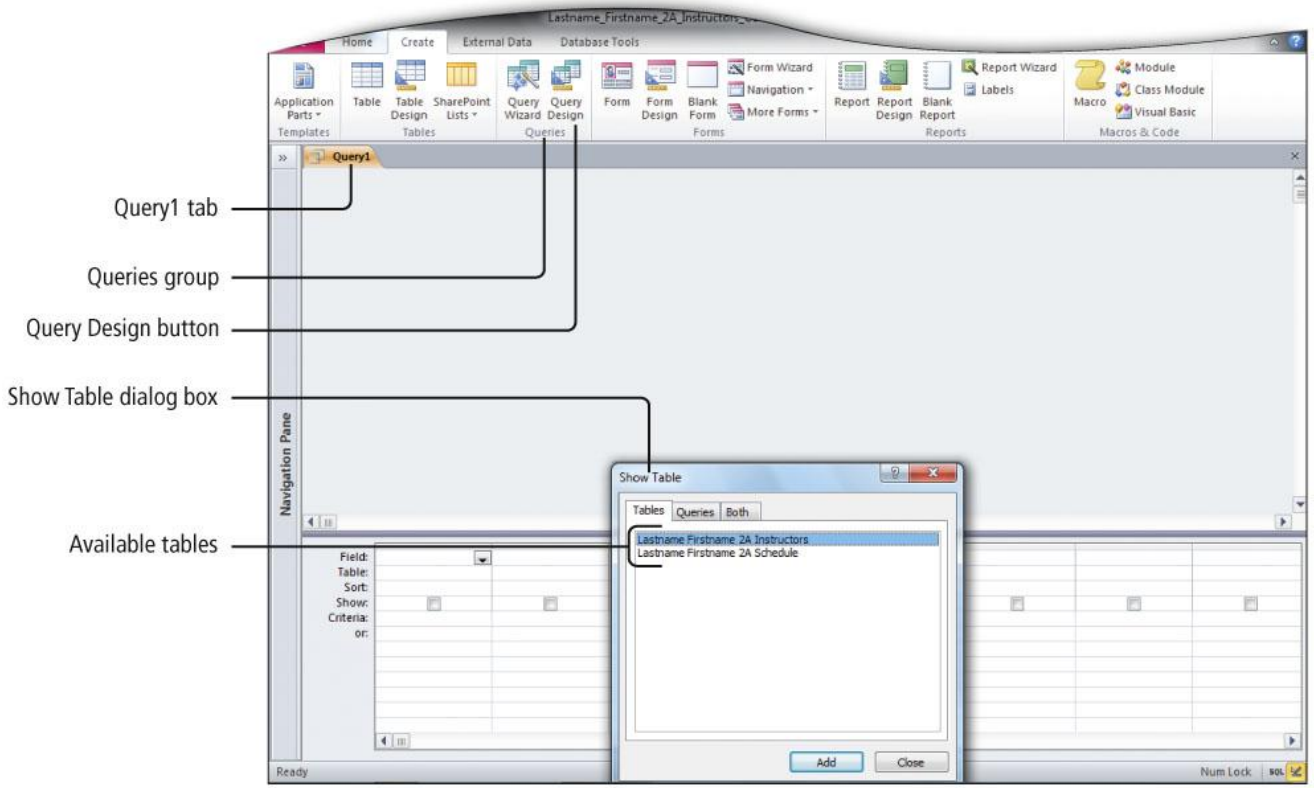
Create a Query in Design View

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



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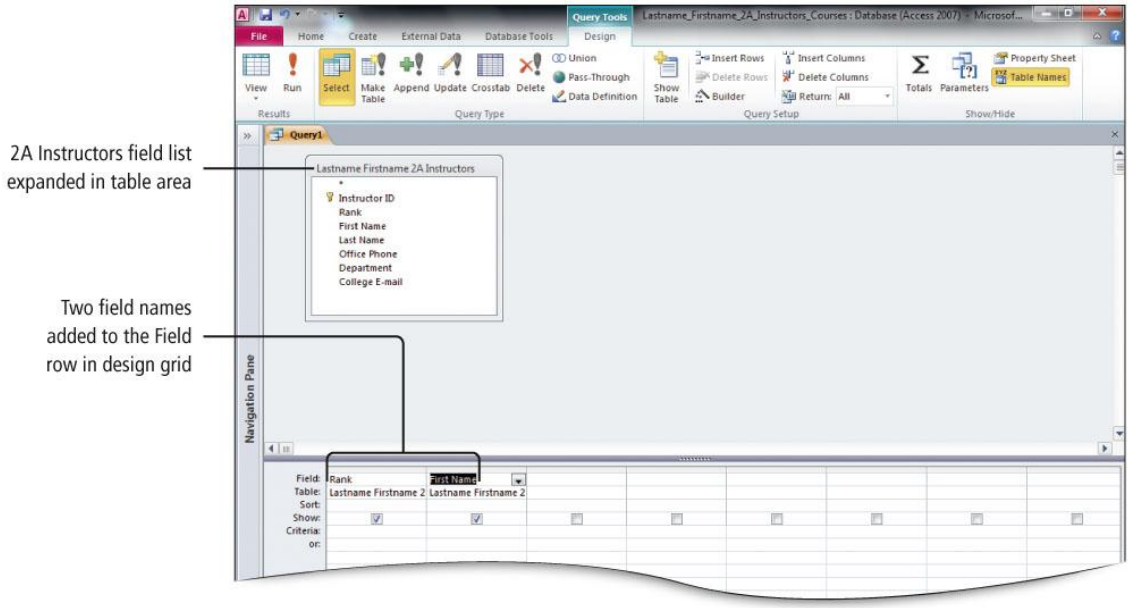
Create a Query in Design View

- **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



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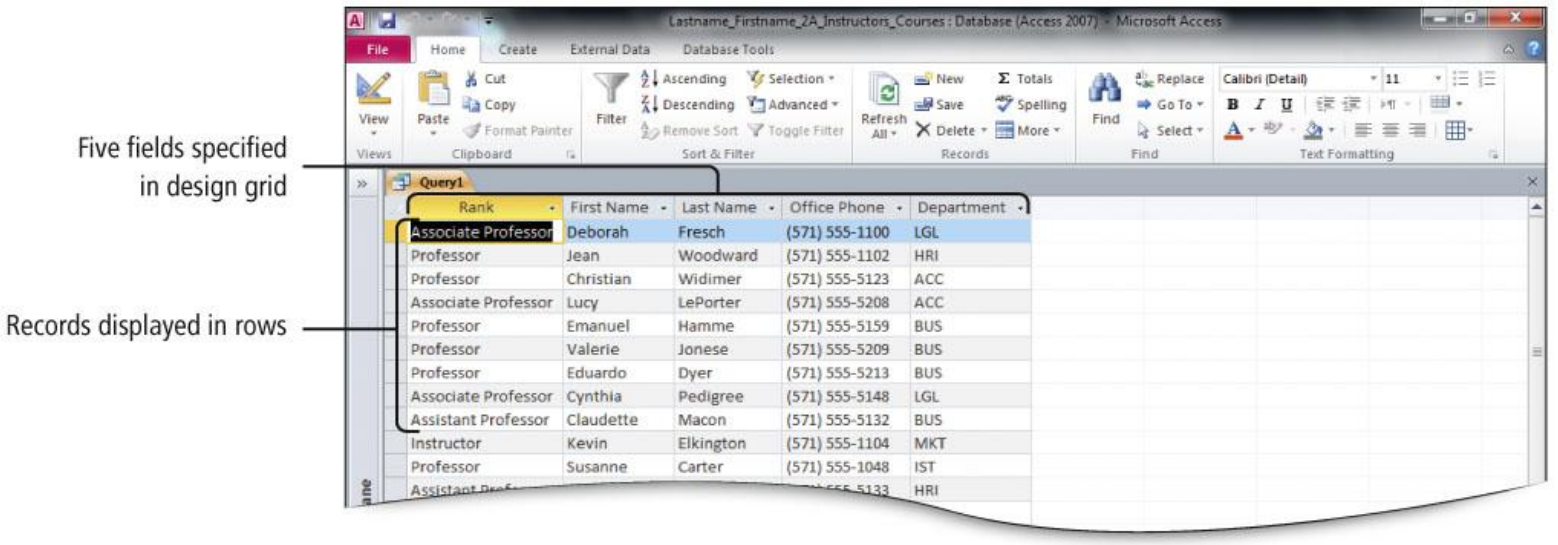
Create a Query in Design View

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



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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

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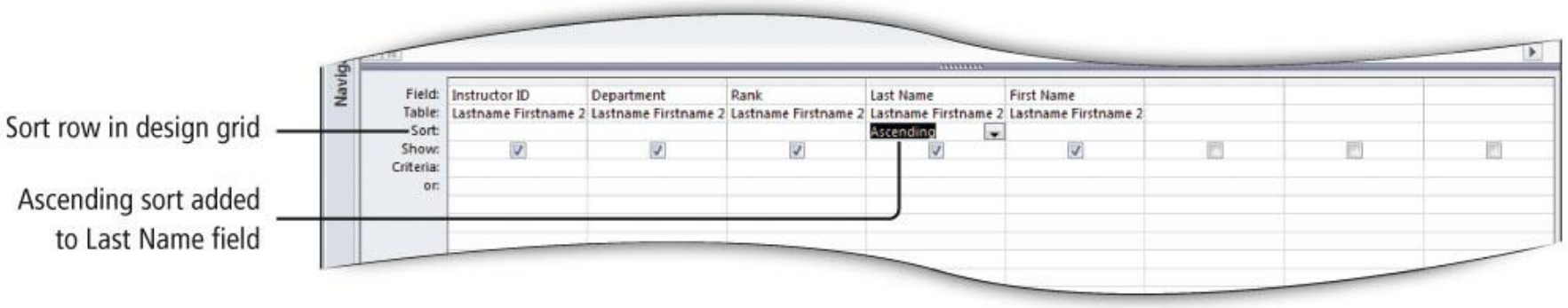
Sort Query Results

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



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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

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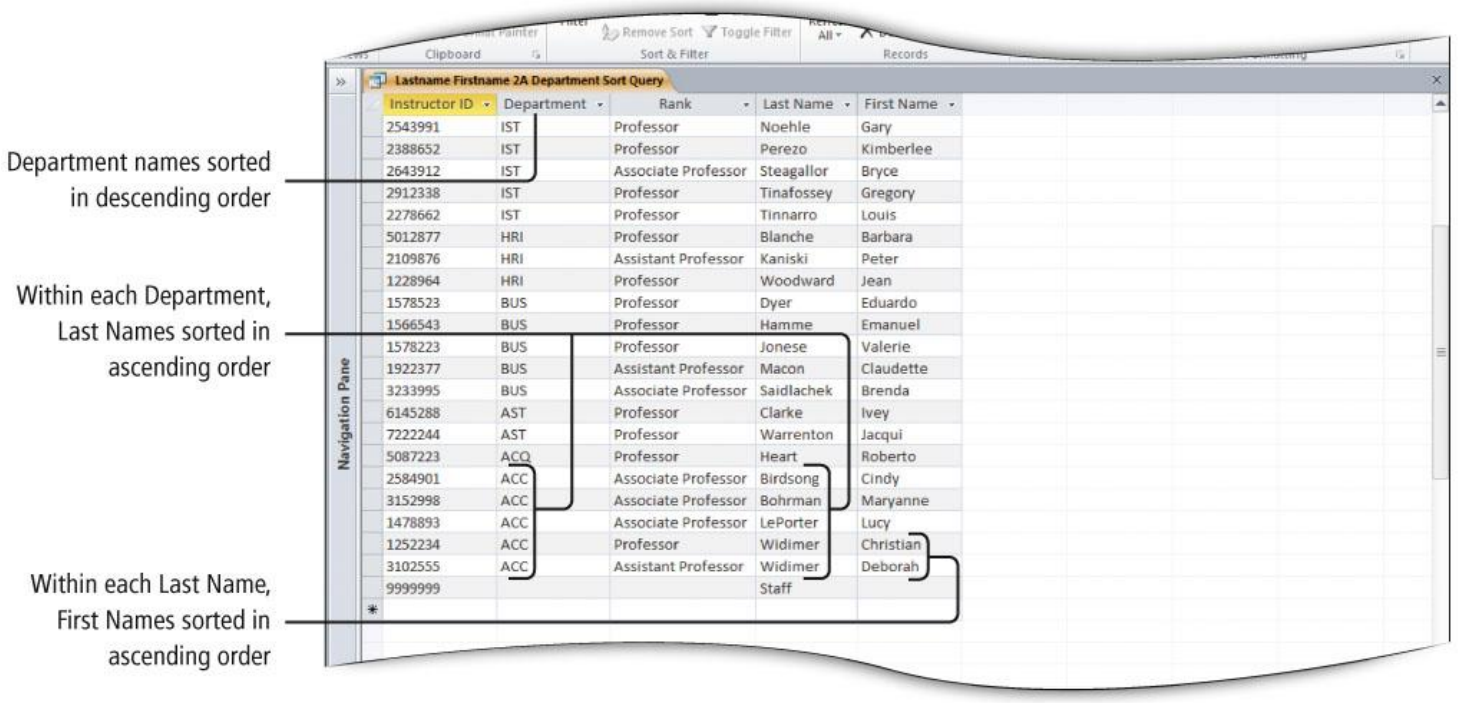
Sort Query Results

- Design view



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	

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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**

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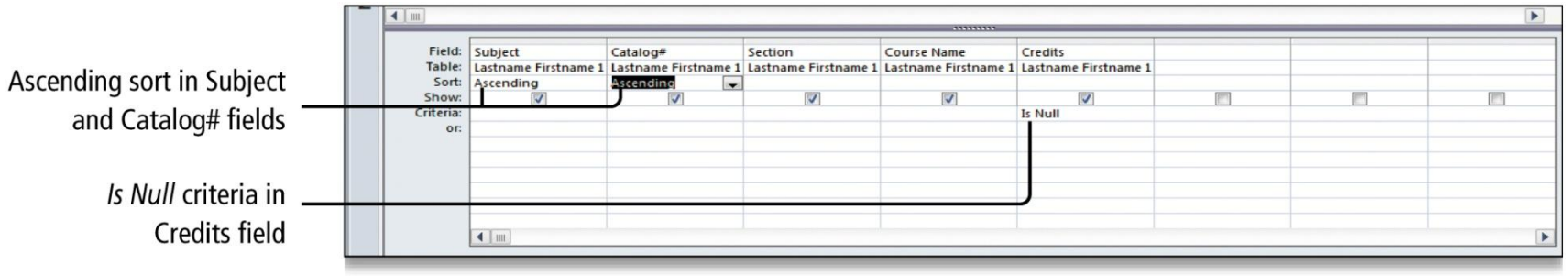
Specify Criteria in a Query

- **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



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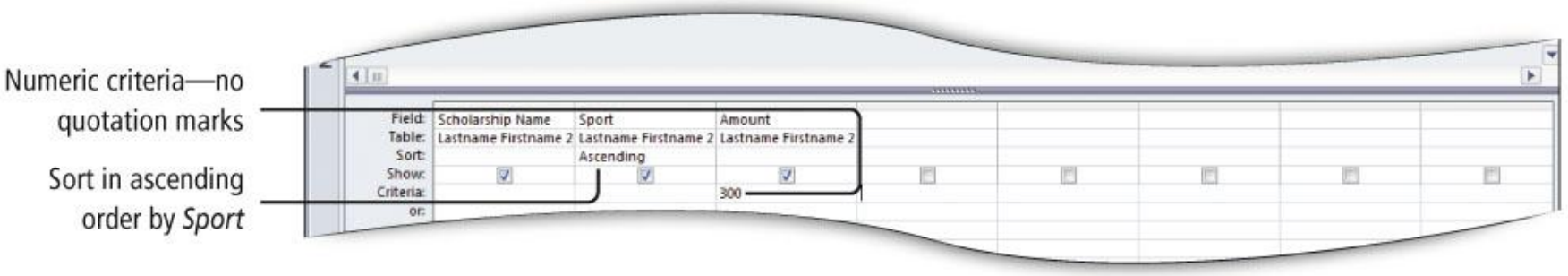
Specify Numeric Criteria in a Query

- **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



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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

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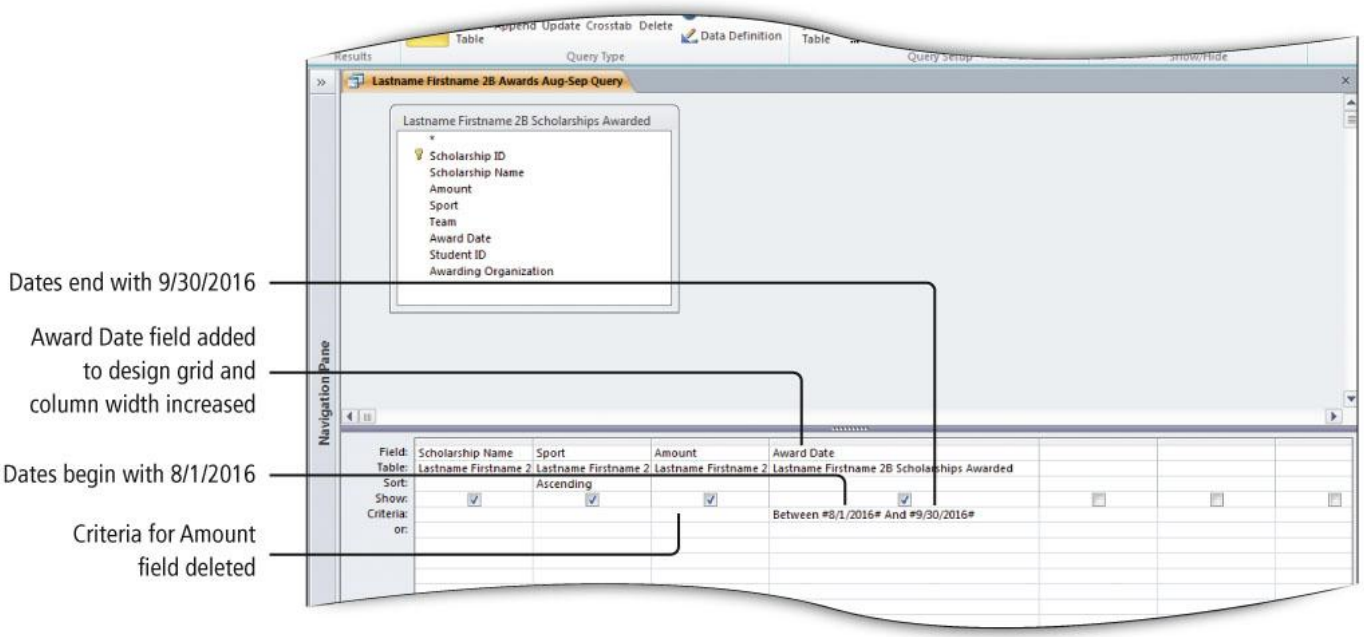
Specify Numeric Criteria in a Query

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



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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

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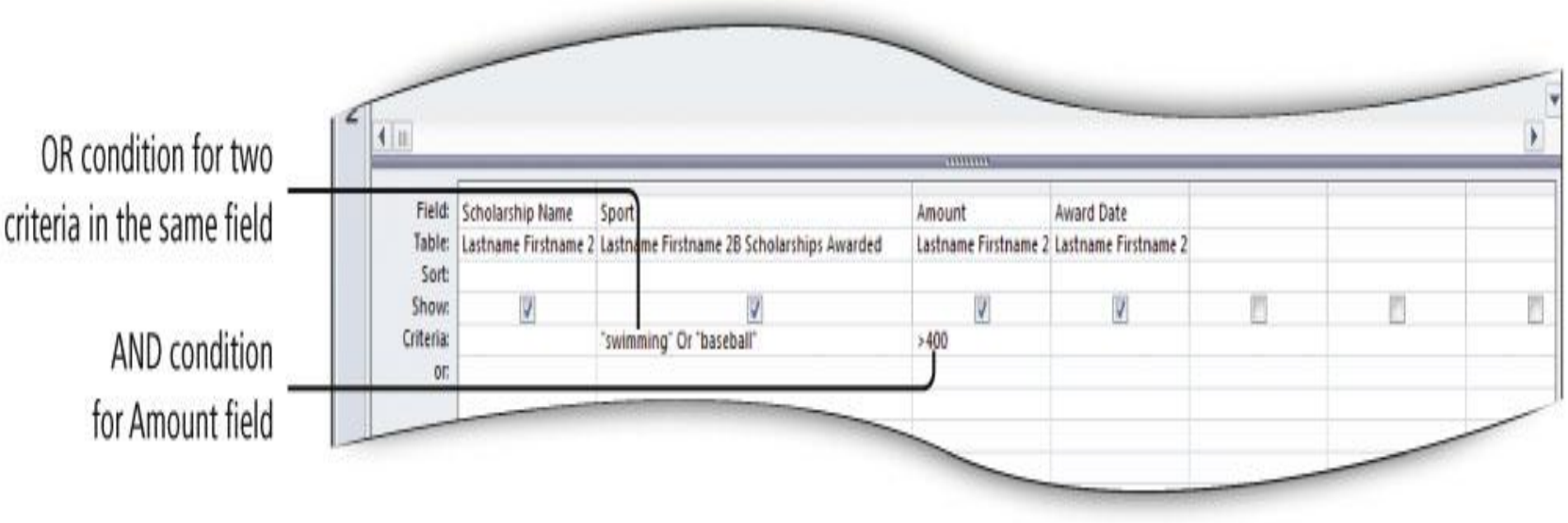
Use Compound Criteria

- Alternative way to use OR compound operator



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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

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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

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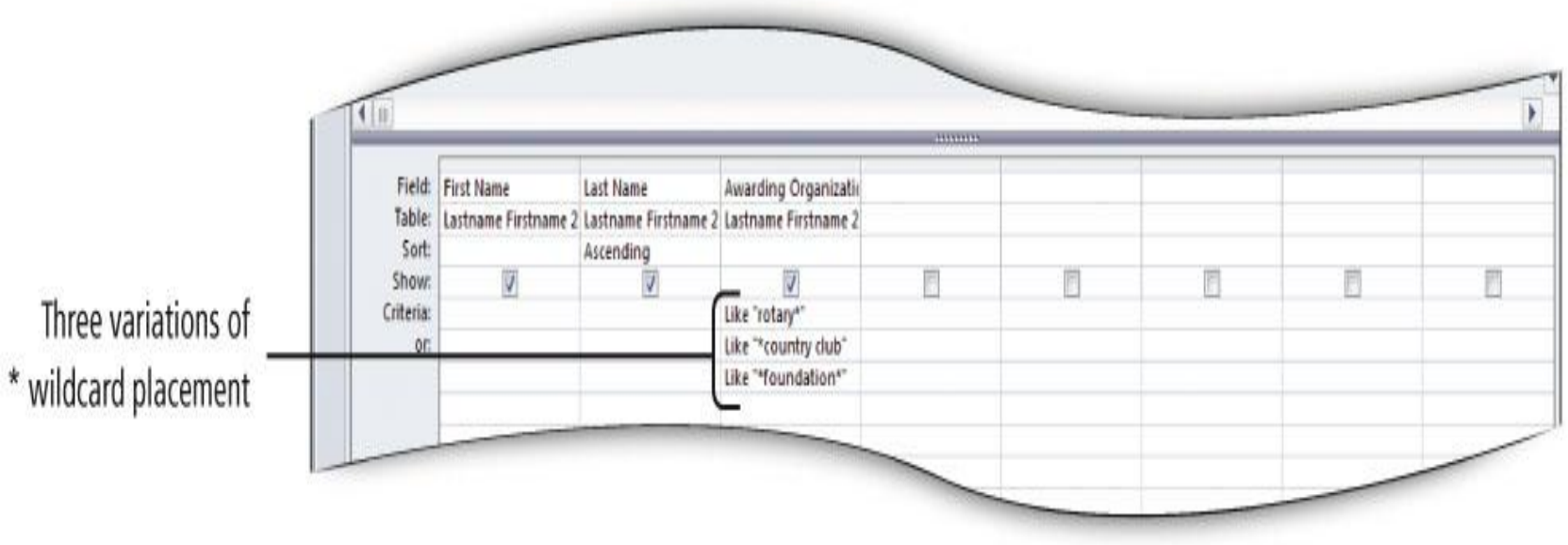
Use Wildcards in a Query

- Wildcard placement



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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

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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**

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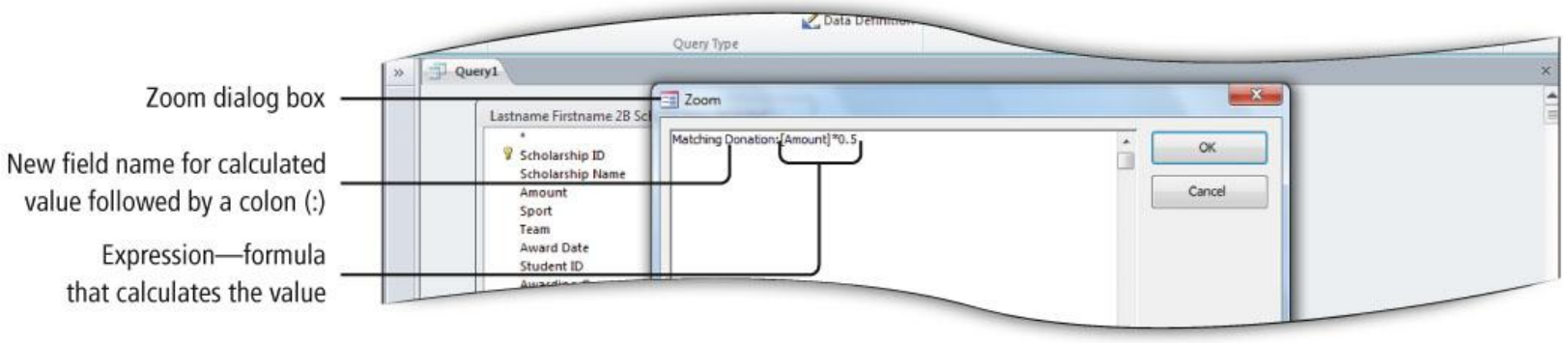
Use Calculated Fields in a Query

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



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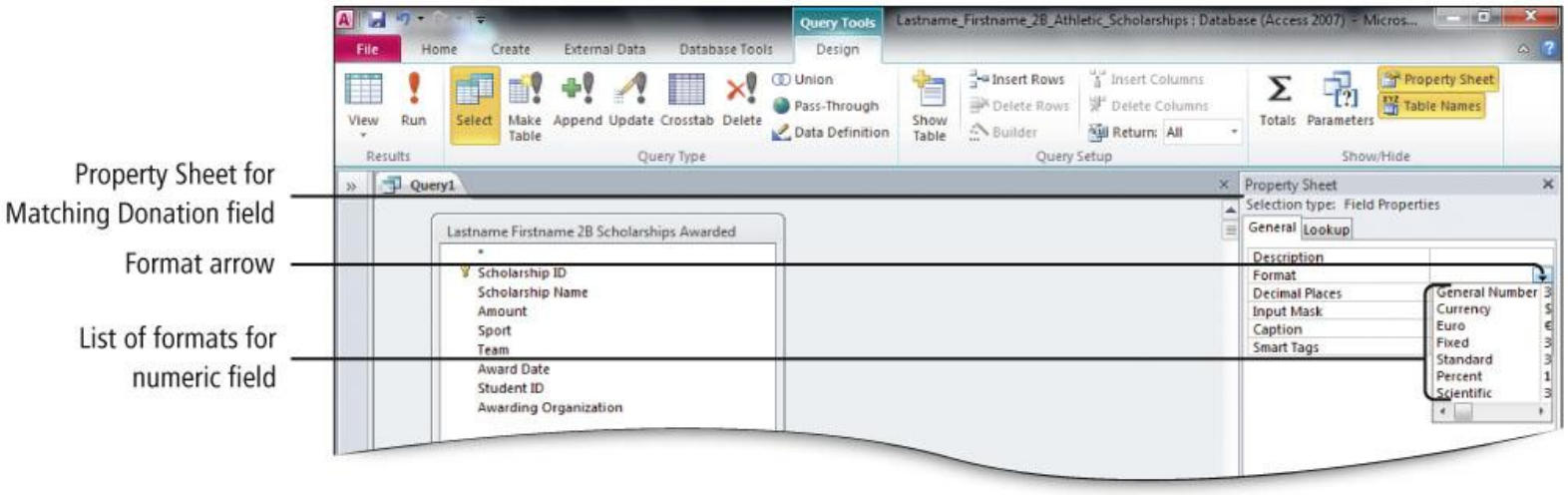
Use Calculated Fields in a Query

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



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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

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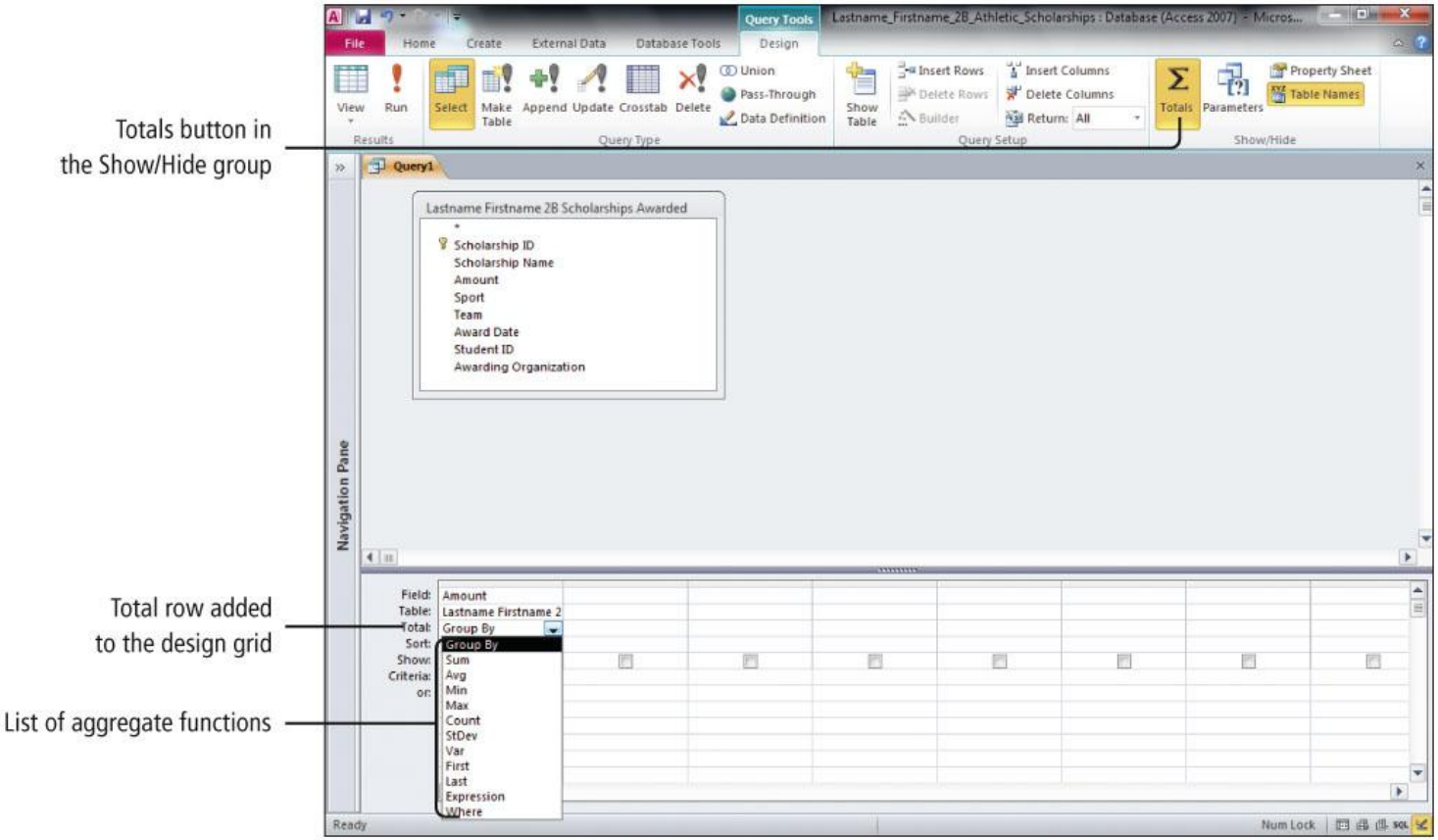
Calculate Statistics and Group Data in a Query



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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

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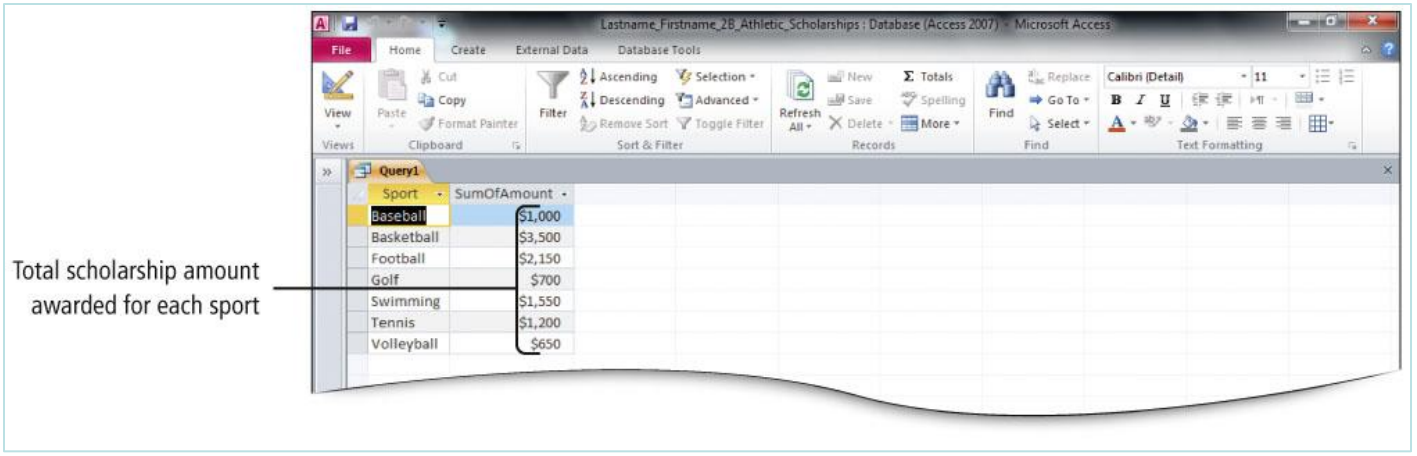
Calculate Statistics and Group Data in a Query

- **Using aggregate functions in a query**



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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**

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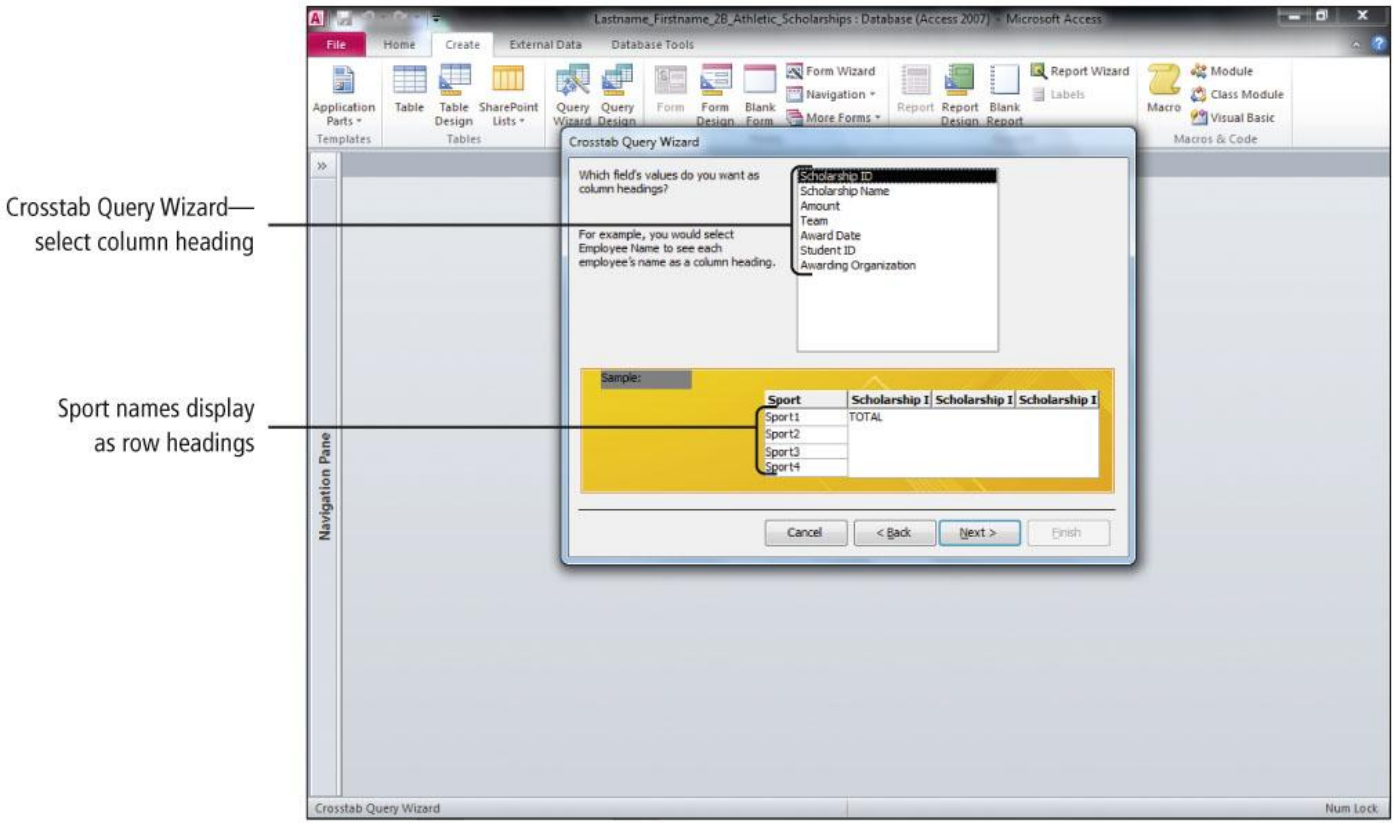
Create a Crosstab Query

- Crosstab Query Wizard



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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**

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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

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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

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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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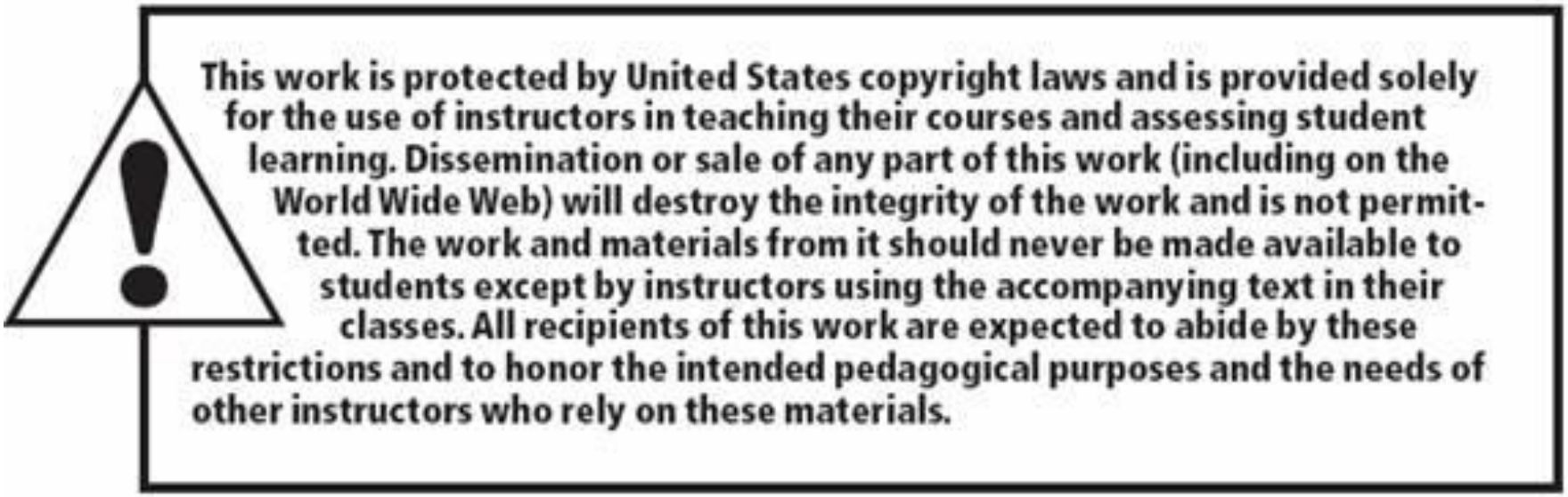

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