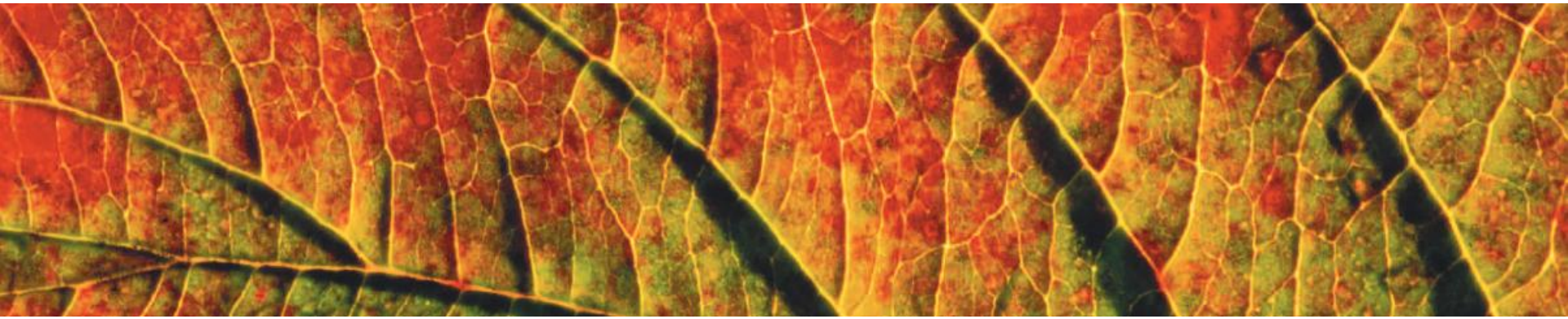
Access Tutorial 3

Maintaining and Querying a Database

Microsoft® Office 2010



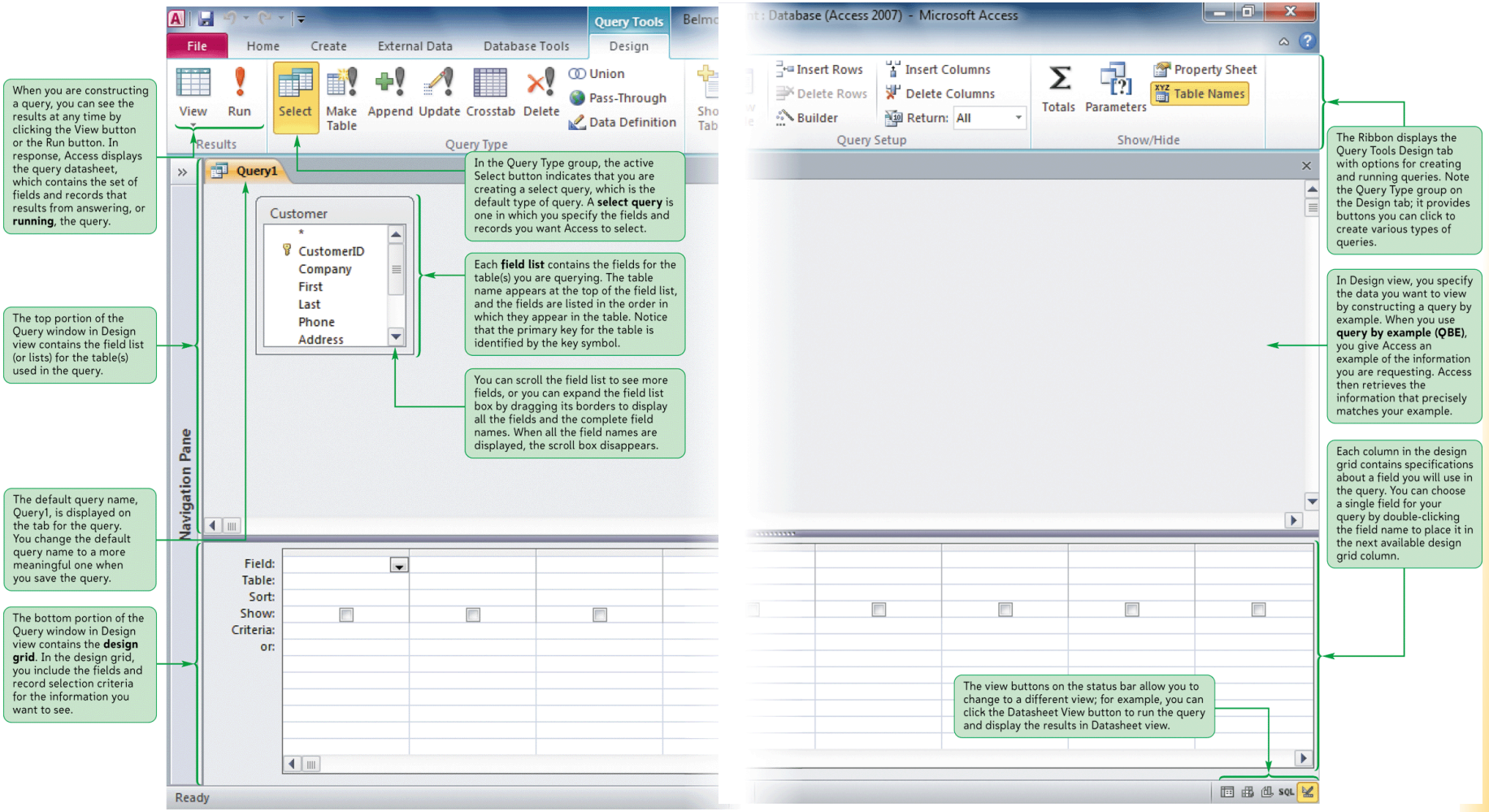
Objectives

- Find, modify, and delete records in a table
- Learn how to use the Query window in Design view
- Create, run, and save queries
- Update data using a query datasheet
- Create a query based on multiple tables
- Sort data in a query
- Filter data in a query

Objectives

- Specify an exact match condition in a query
- Change the font size and alternate row color in a datasheet
- Use a comparison operator in a query to match a range of values
- Use the And and Or logical operators in queries
- Create and format a calculated field in a query
- Perform calculations in a query using aggregate functions and record group calculations
- Change the display of database objects in the Navigation Pane

Query Window in Design View



Updating a Database

- **Updating**, or **maintaining**, a database is the process of adding, modifying, and deleting records in database tables to keep them current and accurate
  - Navigation mode
  - Editing mode

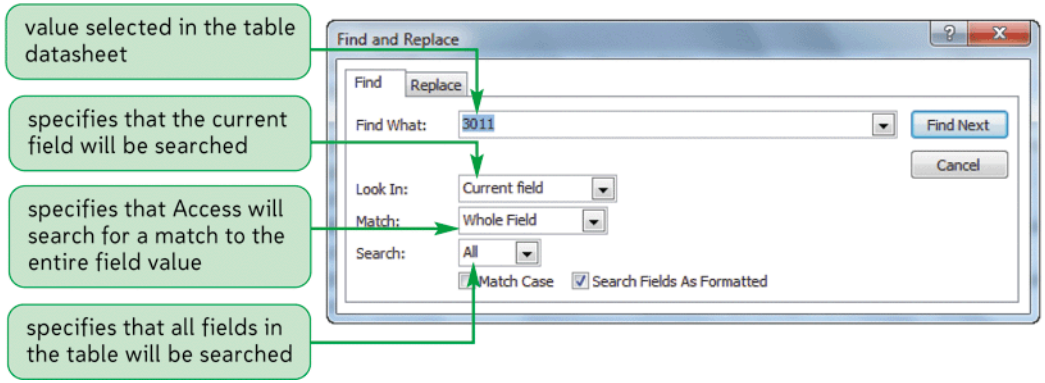
Figure 3-1 Navigation mode and editing mode keystroke techniques

Press	To Move the Selection in Navigation Mode	To Move the Insertion Point in Editing Mode
←	Left one field value at a time	Left one character at a time
→	Right one field value at a time	Right one character at a time
Home	Left to the first field value in the record	To the left of the first character in the field value
End	Right to the last field value in the record	To the right of the last character in the field value
↑ or ↓	Up or down one record at a time	Up or down one record at a time and switch to navigation mode
Tab or Enter	Right one field value at a time	Right one field value at a time and switch to navigation mode
Ctrl+Home	To the first field value in the first record	To the left of the first character in the field value
Ctrl+End	To the last field value in the last record	To the right of the last character in the field value

Finding Data in a Table

- The **Find command** allows you to search a table or query datasheet, or a form, to locate a specific field value or part of a field value

Figure 3-3 Find and Replace dialog box

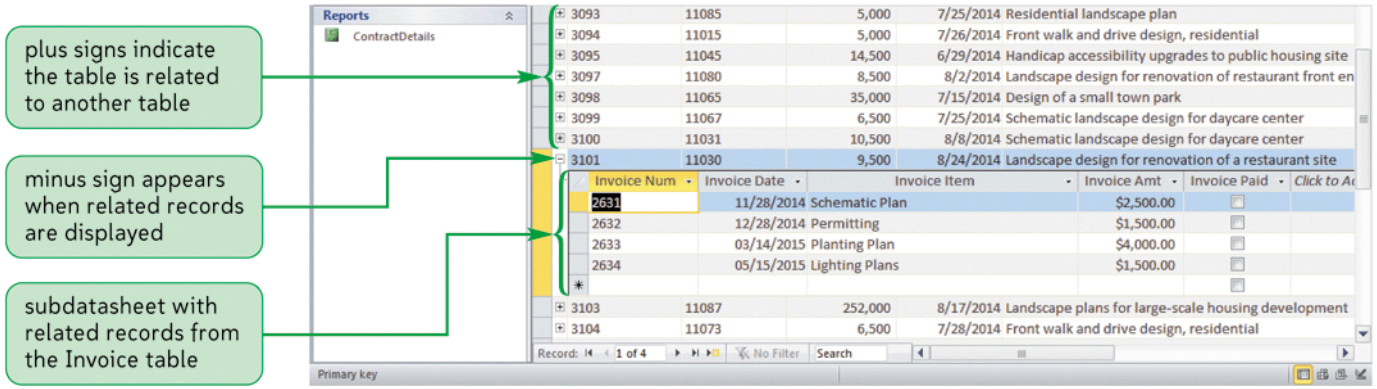


Deleting a Record

- With the table open in Datasheet view, click the row selector for the record you want to delete
- In the Records group on the Home tab, click the Delete button (or right-click the row selector for the record, and then click Delete Record on the shortcut menu)
- In the dialog box asking you to confirm the deletion, click the Yes button

Deleting a Record

Figure 3-4 Related records from the Invoice table in the subdatasheet



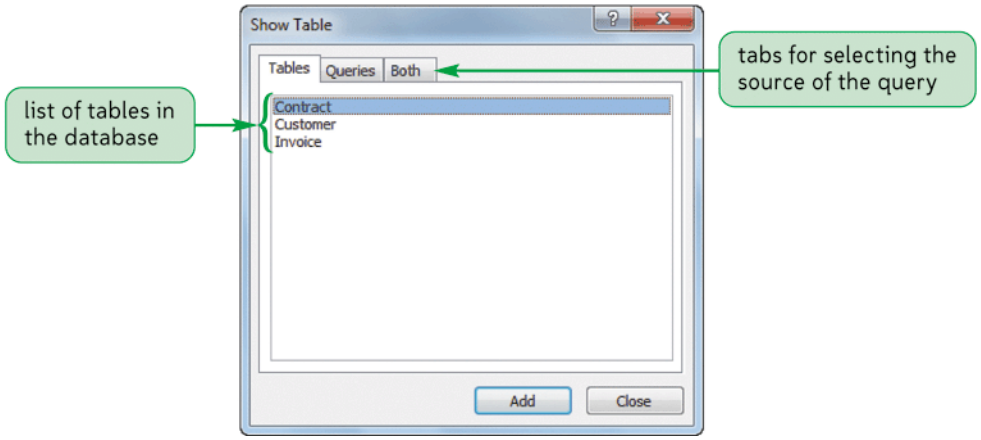
Introduction to Queries

- Access provides powerful query capabilities that allow you to do the following:
  - Display selected fields and records from a table
  - Sort records
  - Perform calculations
  - Generate data for forms, reports, and other queries
  - Update data in the tables in a database
  - Find and display data from two or more tables
- A **Query Wizard** prompts you for information by asking a series of questions and then creates the appropriate query based on your answers

Introduction to Queries

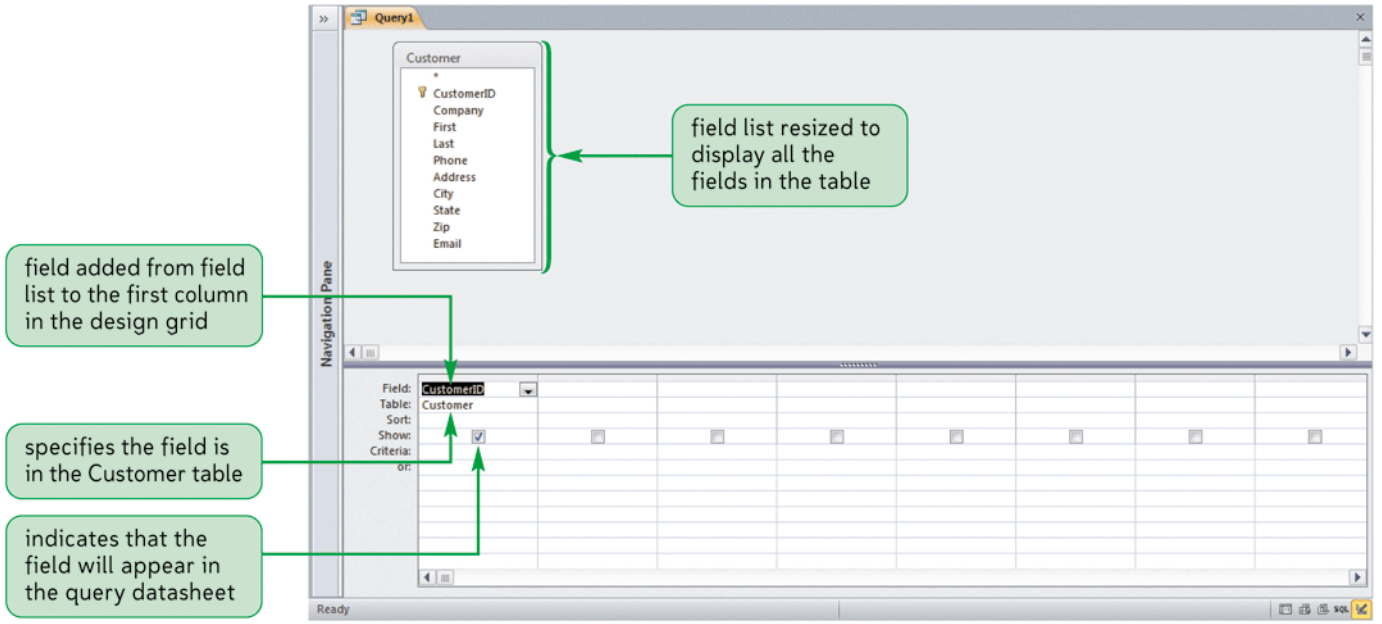
- Click the **Create** tab on the Ribbon
- In the Other group on the Create tab, click the **Query Design** button

Figure 3-5 Show Table dialog box



Introduction to Queries

Figure 3-6 Field added to the design grid



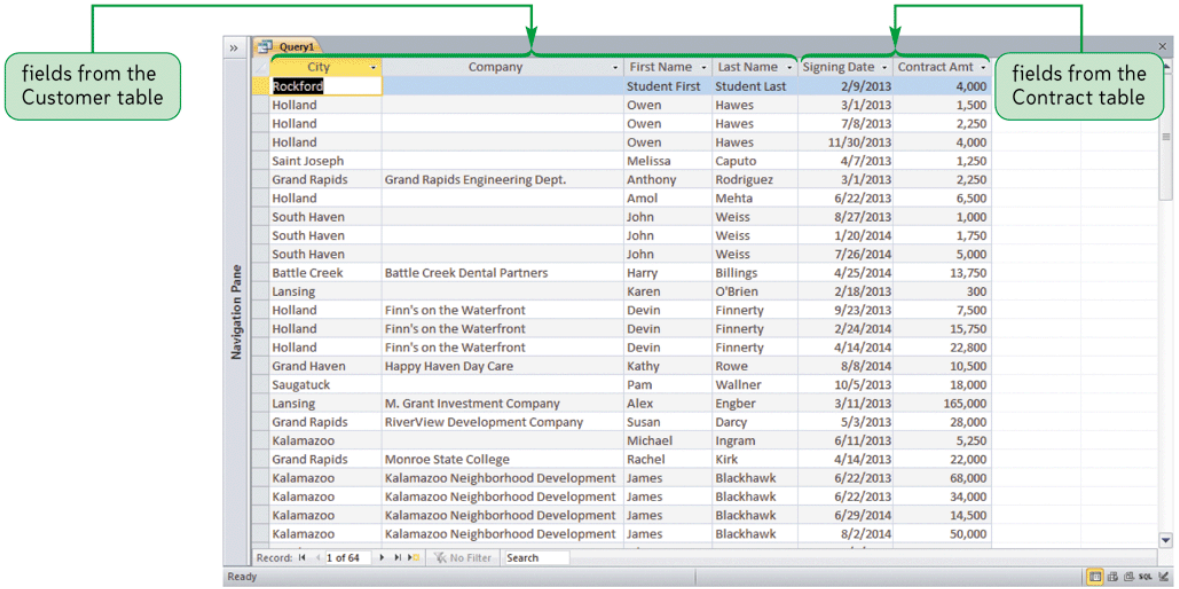
Updating Data Using a Query

- You can update the data in a table using a query datasheet
- After updating the query, close the table

Creating a Multitable Query

- A multitable query is a query based on more than one table
- If you want to create a query that retrieves data from multiple tables, the tables must have a common field

Figure 3-8 Datasheet for query based on the Customer and Contract tables



Sorting Data in a Query

- **Sorting** is the process of rearranging records in a specified order or sequence
- To sort records, you must select the **sort field**, which is the field used to determine the order of records in the datasheet

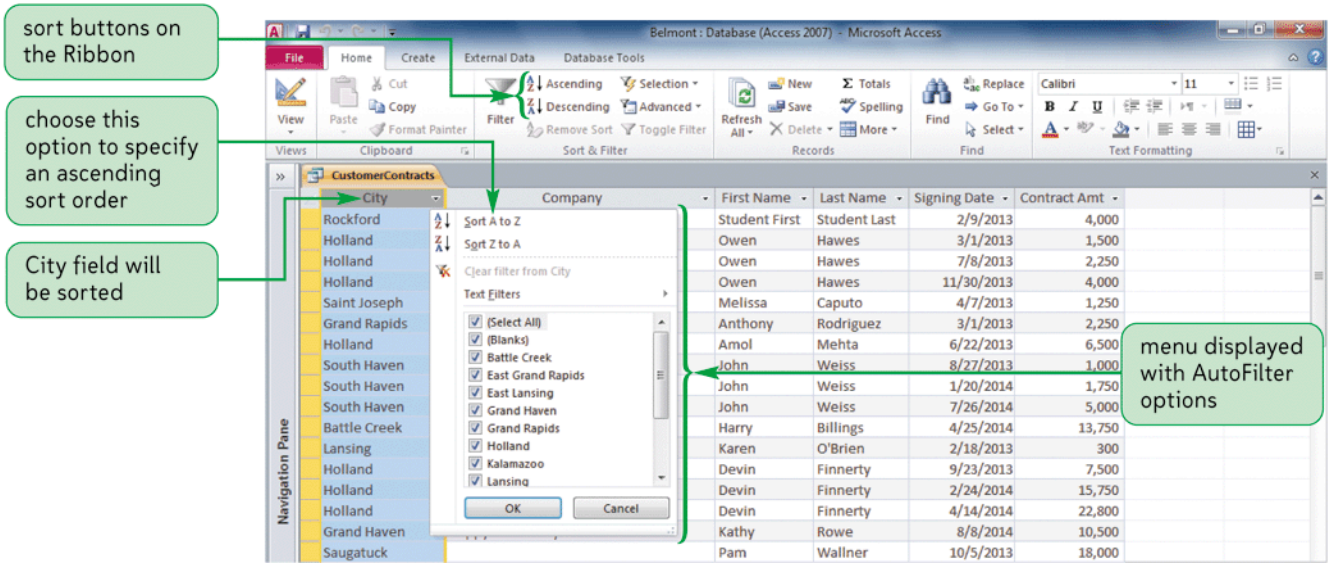
Figure 3-9 Sorting results for different data types

Data Type	Ascending Sort Results	Descending Sort Results
Text	A to Z	Z to A
Number	lowest to highest numeric value	highest to lowest numeric value
Date/Time	oldest to most recent date	most recent to oldest date
Currency	lowest to highest numeric value	highest to lowest numeric value
AutoNumber	lowest to highest numeric value	highest to lowest numeric value
Yes/No	yes (check mark in check box) then no values	no then yes values

Using an AutoFilter to Sort Data

- The **AutoFilter** feature enables you to quickly sort and display field values in various ways
- Clicking the arrow in a column heading displays the AutoFilter menu

Figure 3-10 Using an AutoFilter to sort records in the datasheet



Sorting a Query Datasheet

- In the query datasheet, click the arrow on the column heading for the field you want to sort
- In the menu that opens, click Sort A to Z for an ascending sort, or click Sort Z to A for a descending sort

or

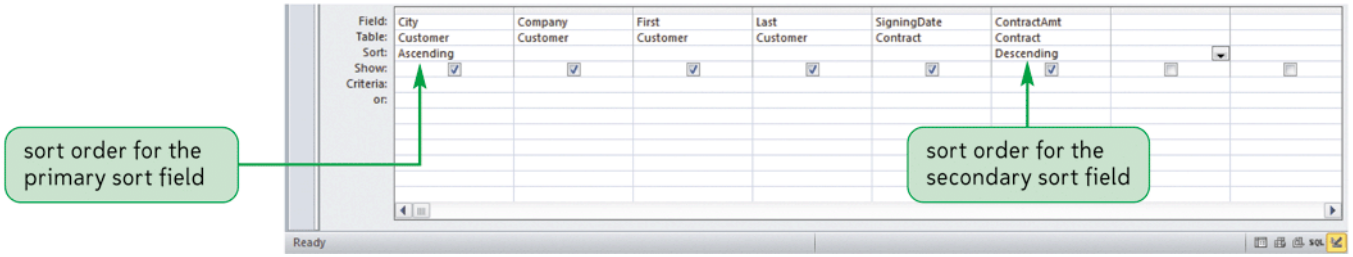
- In the query datasheet, select the column or adjacent columns on which you want to sort
- In the Sort & Filter group on the Home tab, click the Ascending button or the Descending button

or

- In Design view, position the fields serving as sort fields from left to right
- Click the right side of the Sort box for the field you want to sort, and then click Ascending or Descending for the sort order

Sorting a Query Datasheet

Figure 3-11 Selecting two sort fields in Design view

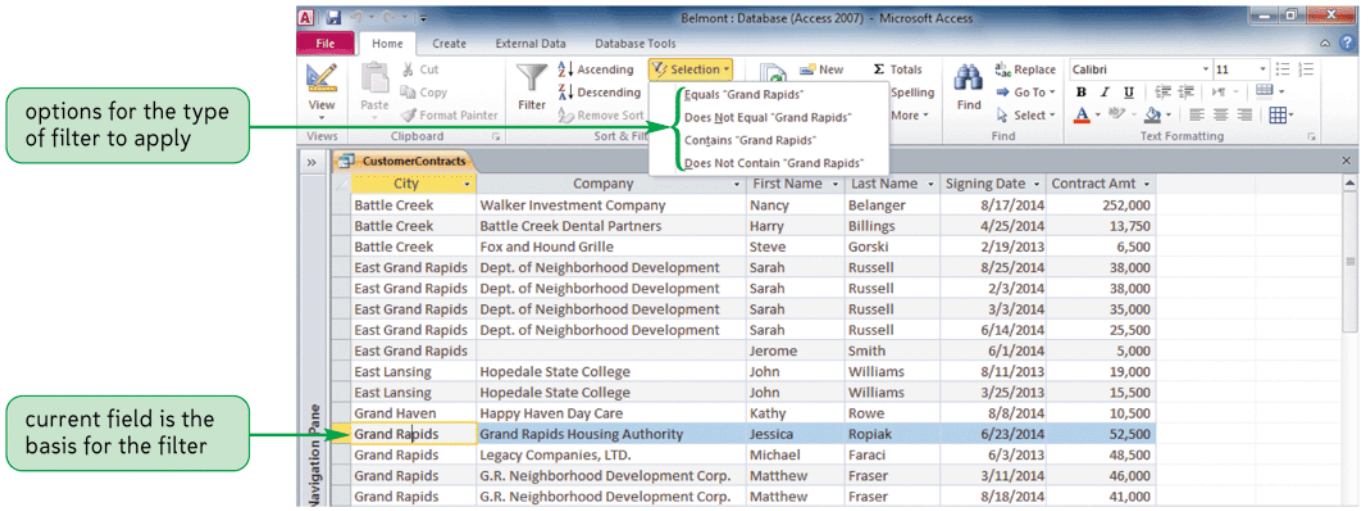


Using Filter By Selection

- A **filter** is a set of restrictions you place on the records in an open datasheet or form to *temporarily* isolate a subset of the records
- In the datasheet or form, select part of the field value that will be the basis for the filter; or, if the filter will be based on the entire field value, click anywhere within the field value
- In the Sort & Filter group on the Home tab, click the Selection button, and then click the type of filter you want to apply

Using Filter By Selection

Figure 3-13 Using Filter By Selection



Selection Criteria in Queries

When creating queries in Design view, you can enter criteria so that Access will display only selected records in the query results.

Field:	CustomerID	Company	First	Last	City
Table:	Customer	Customer	Customer	Customer	Customer
Sort:					
Show:	☑	☑	☑	☑	☑
Criteria:					"Kalamazoo"
or:					

To define a condition for a field, you place the condition in the field's Criteria box in the design grid.

To tell Access which records you want to select, you must specify a condition as part of the query. A **condition** is a criterion, or rule, that determines which records are selected.

The results of a query containing selection criteria include only the records that meet the specified criteria.

KalamazooCustomers

Customer ID	Company	First Name	Last Name	City
11042		Michael	Ingram	Kalamazoo
11045	Kalamazoo Neighborhood Development	James	Blackhawk	Kalamazoo
11072	Sierra Investment Company	Rodrigo	Valencia	Kalamazoo

The results of this query show only customers from Kalamazoo because the condition "Kalamazoo" in the City field's Criteria box specifies that Access should select records only with City field values of Kalamazoo. This type of condition is called an **exact match** because the value in the specified field must match the condition exactly in order for the record to be included in the query results.

Field:	InvoiceNum	InvoiceDate	InvoiceAmt	
Table:	Invoice	Invoice	Invoice	
Sort:				
Show:	☑	☑	☑	☐
Criteria:			> 50000	
or:				

A condition usually consists of an operator, often a comparison operator, and a value. A **comparison operator** asks Access to compare the value in a field to the condition value and to select all the records for which the condition is true.

LargeInvoiceAmts

Invoice Num	Invoice Date	Invoice Amt
2063	07/11/2015	$70,000.00
2453	05/05/2017	$85,000.00
2613	12/17/2017	$105,000.00
2614	09/30/2019	$77,000.00

The results of this query show only those invoices with amounts greater than $50,000 because the condition >50000, which uses the greater than comparison operator, specifies that Access should select records only with InvoiceAmt field values over $50,000.

Field:	ContractNum	ContractAmt	SigningDate	ContractType
Table:	Contract	Contract	Contract	Contract
Sort:				
Show:	☑	☑	☑	☑
Criteria:			Between #9/1/2013# And #11/30/2013#	
or:				

Most comparison operators, such as Between…And…, ask Access to select records that match a range of values for the condition—in this case, all records with dates that fall within the range shown.

FallSignings

Contract Num	Contract Amt	Signing Date	Contract Type
3046	300	9/2/2013	Consultation for back yard, residential
3048	7,500	9/23/2013	Landscape design for restaurant site
3051	18,000	10/5/2013	Site layout and landscape design for residential site
3053	375	9/15/2013	Consultation for front yard, residential
3056	32,500	9/30/2013	Handicap accessibility upgrades to public housing site
3057	15,500	9/30/2013	Handicap accessibility upgrades to public housing site
3060	4,000	11/30/2013	Front walk and drive design, residential

The results of this query show only those contracts that were signed in the fall of 2013 because the condition in the SigningDate's Criteria box specifies that Access should select records only with a signing date between 9/1/2013 and 11/30/2013.

Defining Record Selection Criteria for Queries

- Just as you can display selected fields from a database in a query datasheet, you can display selected records
- To tell Access which records you want to select, you must specify a condition as part of the query
- A condition usually includes a comparison operator

Defining Record Selection Criteria for Queries

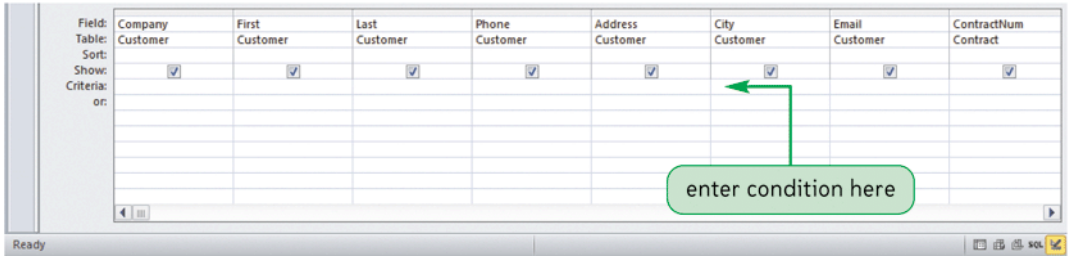
Figure 3-15 Access comparison operators

Operator	Meaning	Example
=	equal to (optional; default operator)	="Hall"
<>	not equal to	<>"Hall"
<	less than	<#1/1/99#
<=	less than or equal to	<=100
>	greater than	>"C400"
>=	greater than or equal to	>=18.75
Between ... And ...	between two values (inclusive)	Between 50 And 325
In ()	in a list of values	In ("Hall", "Seeger")
Like	matches a pattern that includes wildcards	Like "706*"

Specifying an Exact Match

- With an **exact match**, the value in the specified field must match the condition exactly in order for the record to be included in the query results

Figure 3-16 Design grid after adding fields from both tables

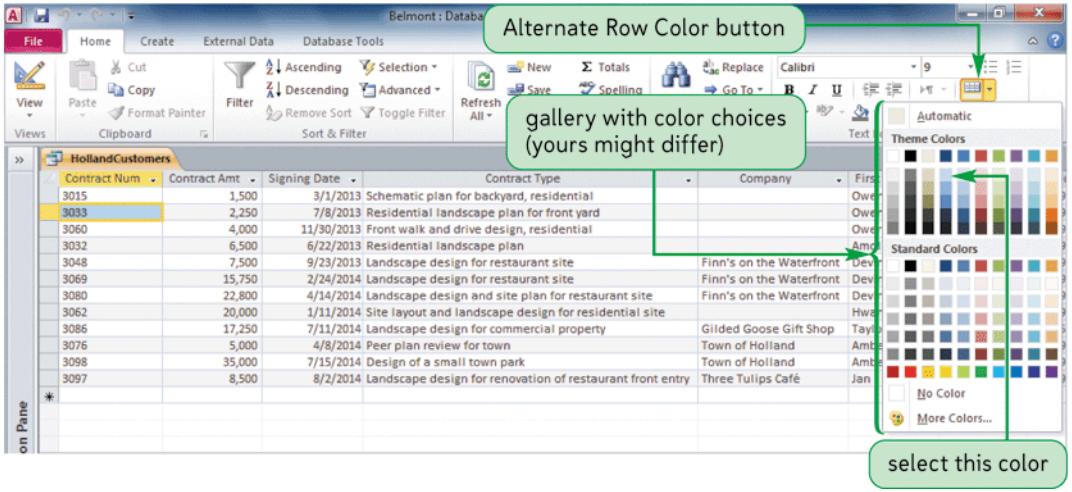


Changing a Datasheet's Appearance

- You can change the characteristics of a datasheet, including the font type and size of text in the datasheet, to improve its appearance or readability
- A **theme** is a predefined set of formats including colors, fonts, and other effects that enhance an object's appearance and usability

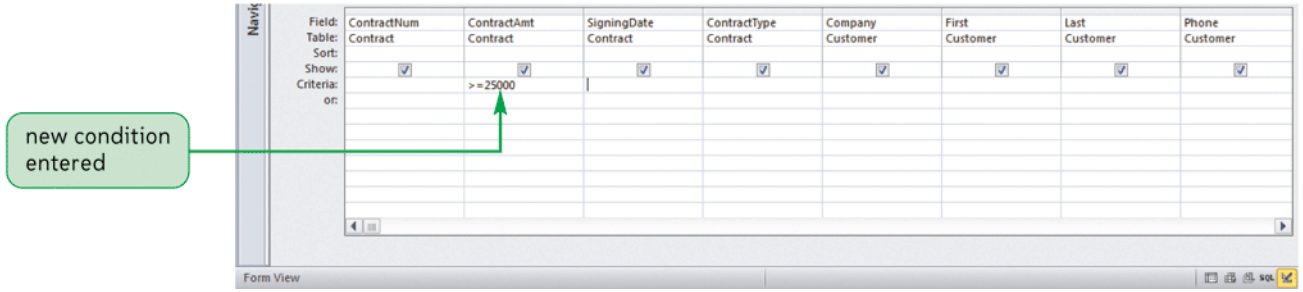
Changing a Datasheet's Appearance

Figure 3-22 Gallery of color choices for alternate row color



Using a Comparison Operator to Match a Range of Values

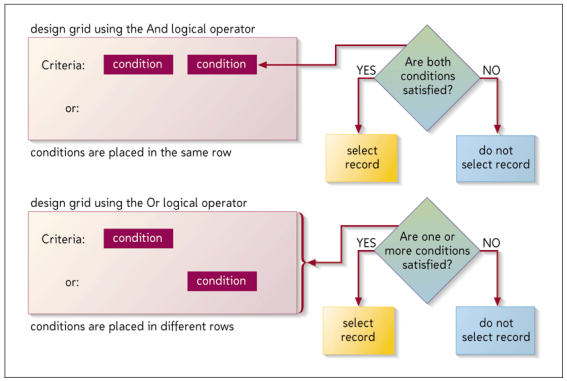
Figure 3-24 Criteria entered for the ContractAmt field



Defining Multiple Selection Criteria for Queries

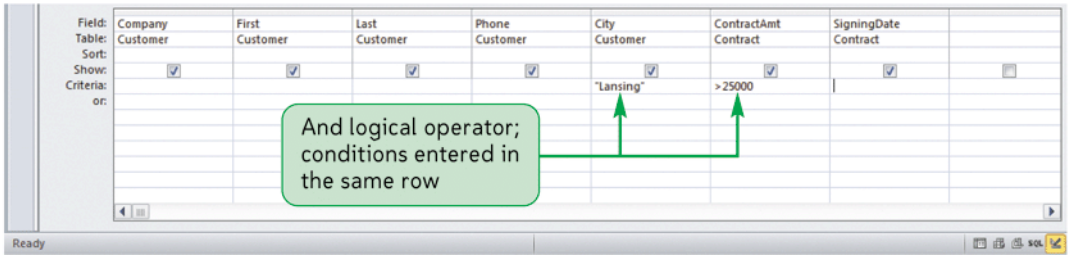
- Multiple conditions require you to use **logical operators** to combine two or more conditions
  - Use the **And logical operator** when you want a record selected only if two or more conditions are met
  - Use the **Or logical operator** when you place conditions in different Criteria rows

Figure 3-27 Logical operators And and Or for multiple selection criteria



Defining Multiple Selection Criteria for Queries

Figure 3-28 Query to find customers in Lansing with large contracts

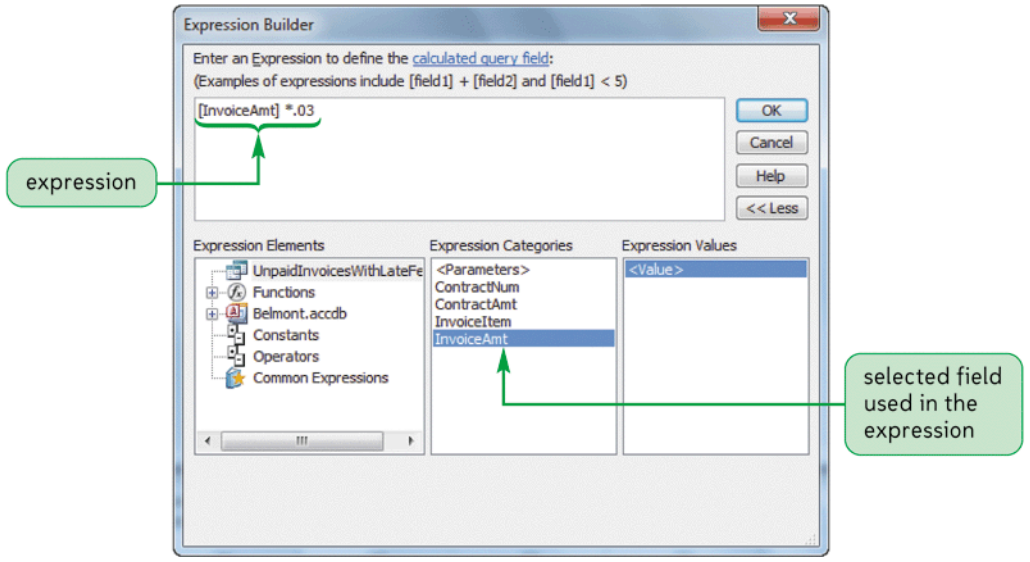


Creating a Calculated Field

- In addition to using queries to retrieve, sort, and filter data in a database, you can use a query to perform calculations
- To perform a calculation, you define an **expression** containing a combination of database fields, constants, and operators
  - **Expression Builder** is an Access tool that makes it easy for you to create an expression
- Open the query in Design view
- In the design grid, click the Field box in which you want to create an expression
- In the Query Setup group on the Design tab, click the Builder button
- Use the expression elements and common operators to build the expression, or type the expression directly in the expression box
- Click the OK button

Creating a Calculated Field

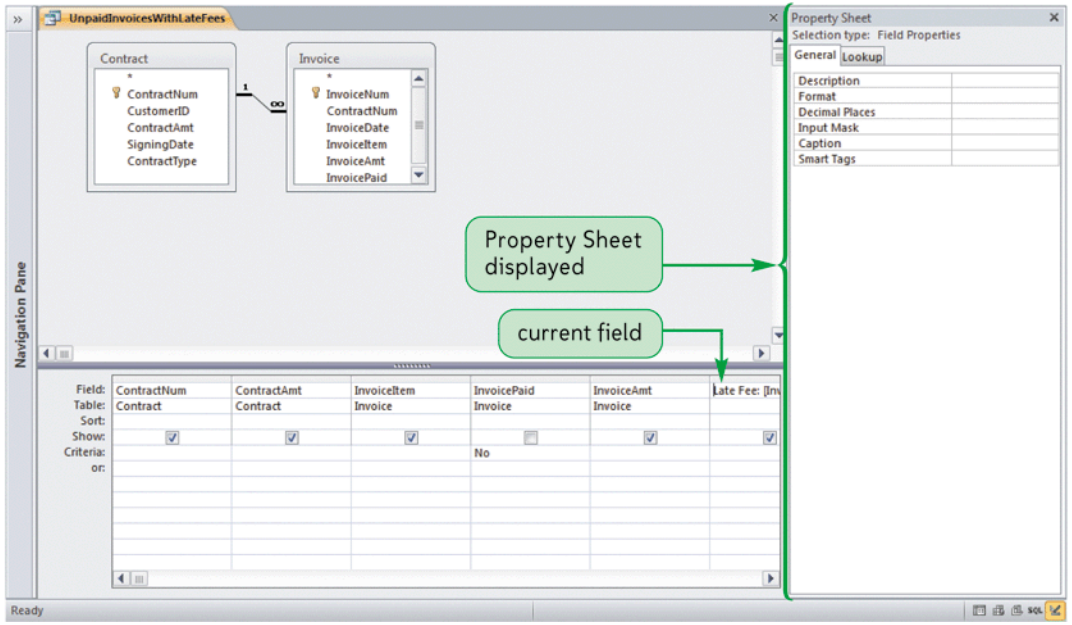
Figure 3-32 Completed expression for the calculated field



Formatting a Calculated Field

- You can specify a particular format for a calculated field, just as you can for any field, by modifying its properties

Figure 3-34 Property Sheet for the calculated field



Using Aggregate Functions

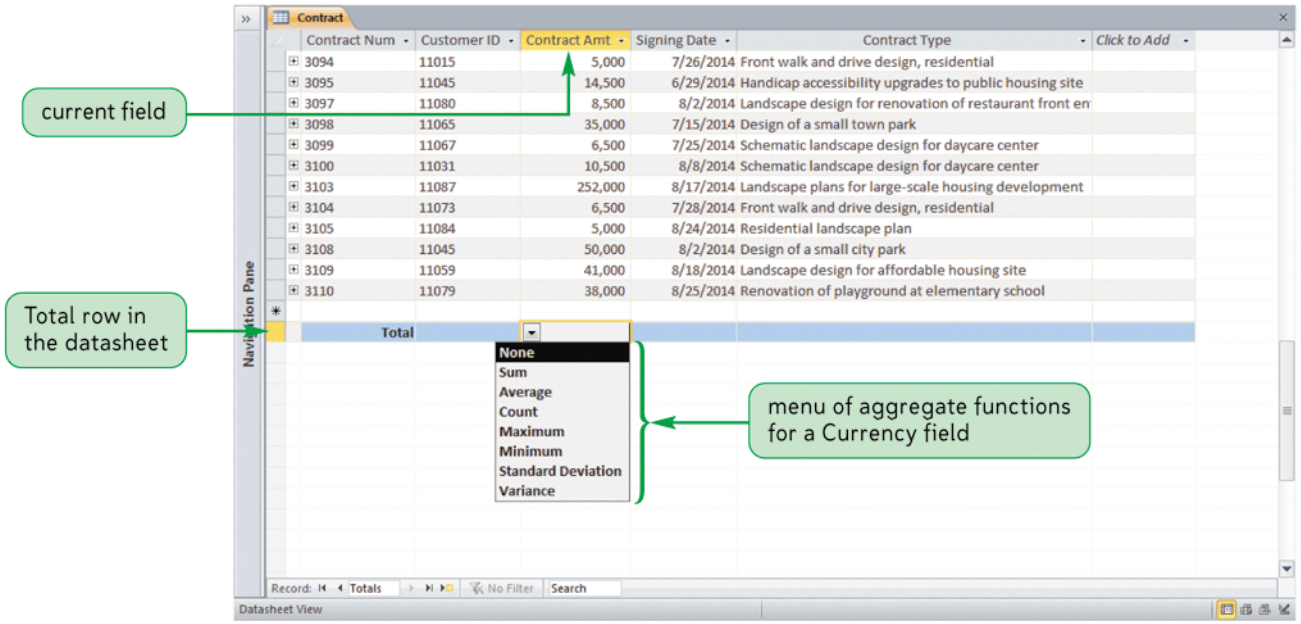
- **Aggregate functions** perform arithmetic operations on selected records in a database
- If you want to quickly perform a calculation using an aggregate function in a table or query datasheet, you can use the Totals button in the Records group on the Home tab

Figure 3-35 Frequently used aggregate functions

Aggregate Function	Determines	Data Types Supported
Average	Average of the field values for the selected records	AutoNumber, Currency, Date/Time, Number
Count	Number of records selected	AutoNumber, Currency, Date/Time, Memo, Number, OLE Object, Text, Yes/No
Maximum	Highest field value for the selected records	AutoNumber, Currency, Date/Time, Number, Text
Minimum	Lowest field value for the selected records	AutoNumber, Currency, Date/Time, Number, Text
Sum	Total of the field values for the selected records	AutoNumber, Currency, Date/Time, Number

Using Aggregate Functions

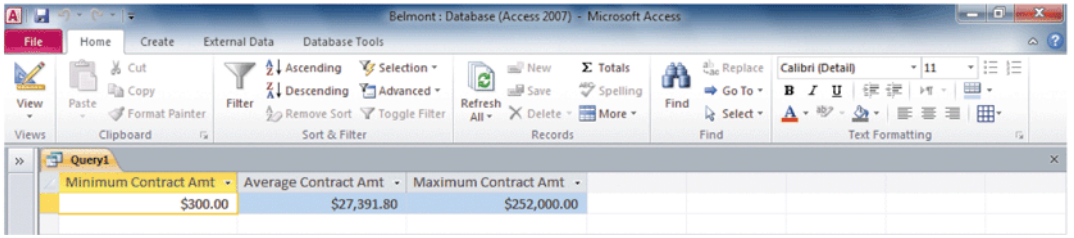
Figure 3-36 Using aggregate functions in the Total row



Creating Queries with Aggregate Functions

- Aggregate functions operate on the records that meet a query's selection criteria

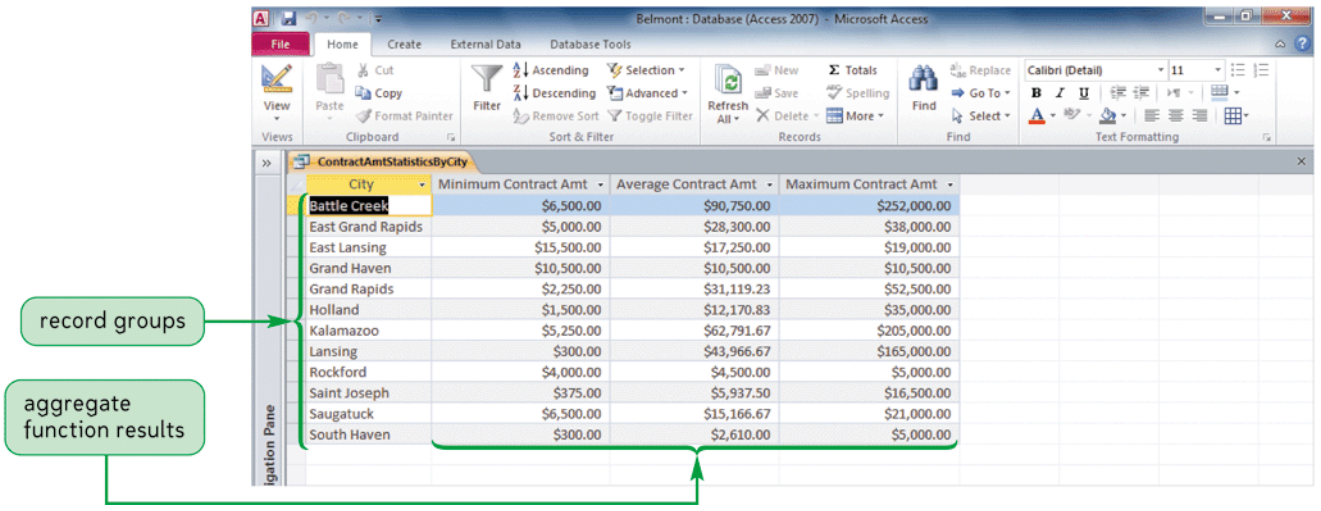
Figure 3-38 Result of the query using aggregate functions



Using Record Group Calculations

- The **Group By operator** divides the selected records into groups based on the values in the specified field

Figure 3-39 Aggregate functions grouped by City



Working with the Navigation Pane

- The Navigation Pane is the main area for working with the objects in a database
- The Navigation Pane divides database objects into categories, and each category contains groups
  - **Object Type**
  - **All Access Objects**

Figure 3-40 Navigation Pane menu