

# Access Tutorial 2

## Building a Database and Defining Table Relationships



# Objectives

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- Learn the guidelines for designing databases and setting field properties
- View and modify field data types and formatting
- Create a table in Design view
- Define fields and specify a table's primary key
- Modify the structure of a table



# Objectives

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- Import data from an Excel worksheet
- Create a table by importing an existing table structure
- Delete, rename, and move fields
- Add data to a table by importing a text file
- Define a relationship between two tables



# Guidelines for Designing Databases

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- Identify all the fields needed to produce the required information
- Organize each piece of data into its smallest useful part
- Group related fields into tables
- Determine each table's primary key
- Include a common field in related tables
- Avoid data redundancy
- Determine the properties of each field



# Guidelines for Setting Field Properties

- You must name each field, table, and other object
- Choose an appropriate data type

Data types for fields **Figure 2-4**

Data Type	Description	Field Size
Text	Allows field values containing letters, digits, spaces, and special characters. Use for names, addresses, descriptions, and fields containing digits that are not used in calculations.	0 to 255 characters; default is 255
Memo	Allows field values containing letters, digits, spaces, and special characters. Use for long comments and explanations.	1 to 65,535 characters; exact size is determined by entry
Number	Allows positive and negative numbers as field values. Numbers can contain digits, a decimal point, commas, a plus sign, and a minus sign. Use for fields that will be used in calculations, except those involving money.	1 to 15 digits
Date/Time	Allows field values containing valid dates and times from January 1, 100 to December 31, 9999. Dates can be entered in month/day/year format, several other date formats, or a variety of time formats, such as 10:35 PM. You can perform calculations on dates and times, and you can sort them. For example, you can determine the number of days between two dates.	8 bytes
Currency	Allows field values similar to those for the Number data type, but is used for storing monetary values. Unlike calculations with Number data type decimal values, calculations performed with the Currency data type are not subject to round-off error.	Accurate to 15 digits on the left side of the decimal point and to 4 digits on the right side
AutoNumber	Consists of integer values created automatically by Access each time you create a new record. You can specify sequential numbering or random numbering, which guarantees a unique field value, so that such a field can serve as a table's primary key.	9 digits
Yes/No	Limits field values to yes and no, on and off, or true and false. Use for fields that indicate the presence or absence of a condition, such as whether an order has been filled or whether an invoice has been paid.	1 character
OLE Object	Allows field values that are created in other Microsoft Windows programs as objects, such as spreadsheets and word-processing documents. These objects can be linked or embedded. Each field value is limited to a single file.	1 gigabyte maximum; exact size depends on object size
Hyperlink	Consists of text used as a hyperlink address, which can have up to four parts: the text that appears in a field or control; the path to a file or page; a location within the file or page; and text displayed as a ScreenTip.	Up to 65,535 characters total for the four parts of the Hyperlink data type
Attachment	Allows field values with one or more attached files, such as images, videos, documents, charts, and other supported files, similar to e-mail attachments. Provides greater flexibility than the OLE Object data type and uses storage space more efficiently.	2 gigabytes maximum; individual attached files cannot exceed 256 MB
Lookup Wizard	Creates a field that lets you look up a value in another table or in a predefined list of values.	Same size as the primary key field used to perform the lookup

# Guidelines for Setting Field Properties

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- The **Field Size property** defines a field value's maximum storage size for Text, Number, and AutoNumber fields only
  - Byte
  - Integer
  - Long Integer
  - Single
  - Double
  - Replication ID
  - Decimal



# Viewing and Modifying Field Data Types and Formatting

Data type for the Customer ID field

Figure 2-5

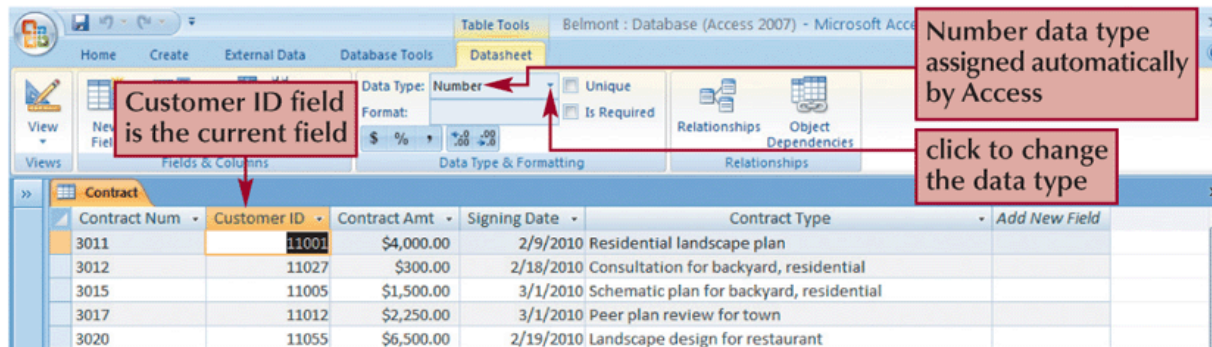
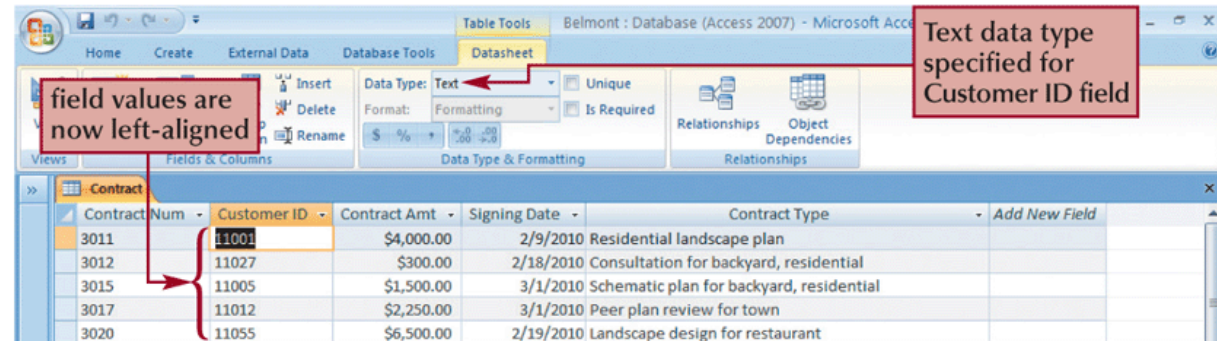


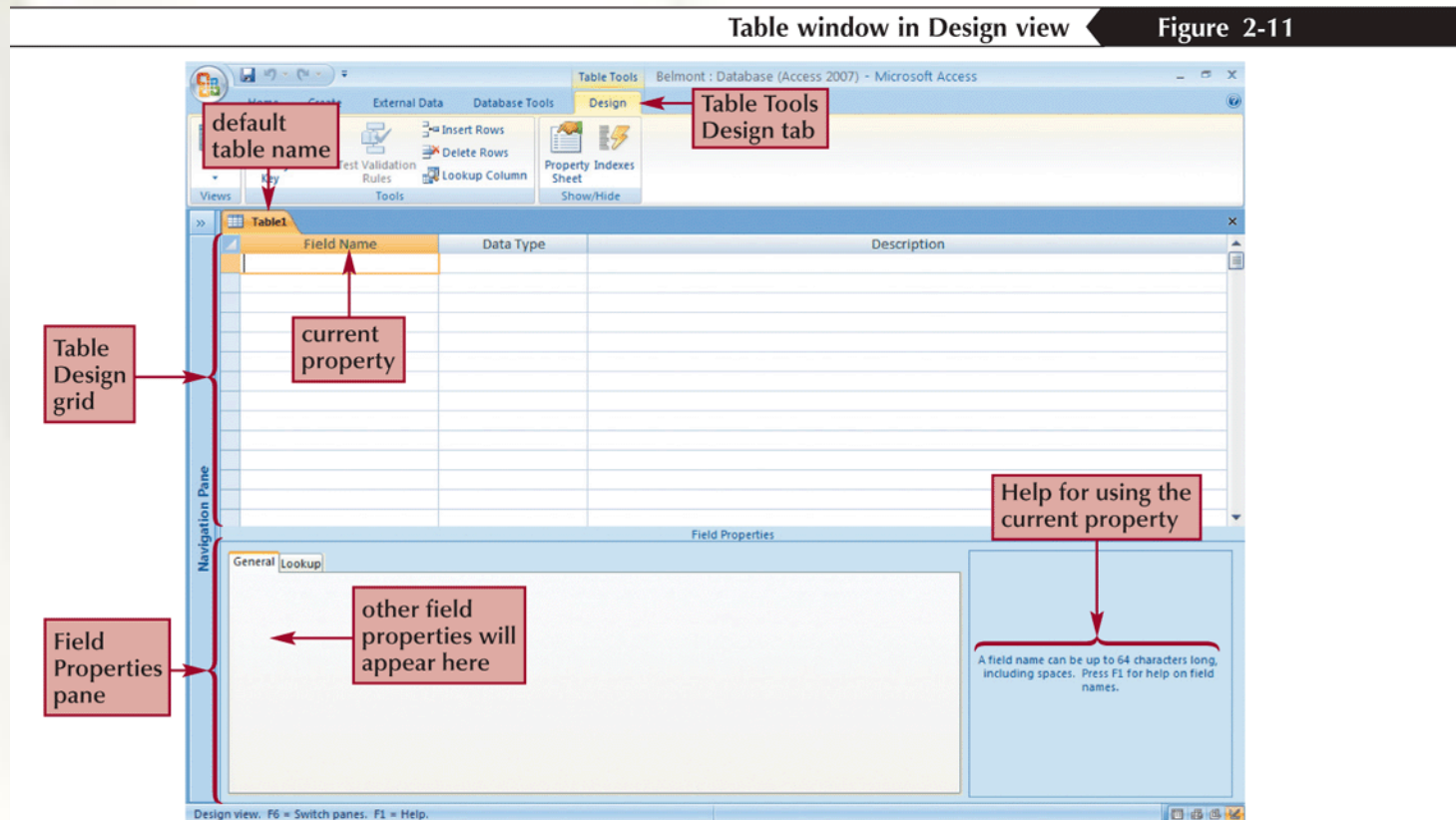
Figure 2-6

Customer ID field data type changed to Text





# Creating a Table in Design View





# Defining a Field in Design View

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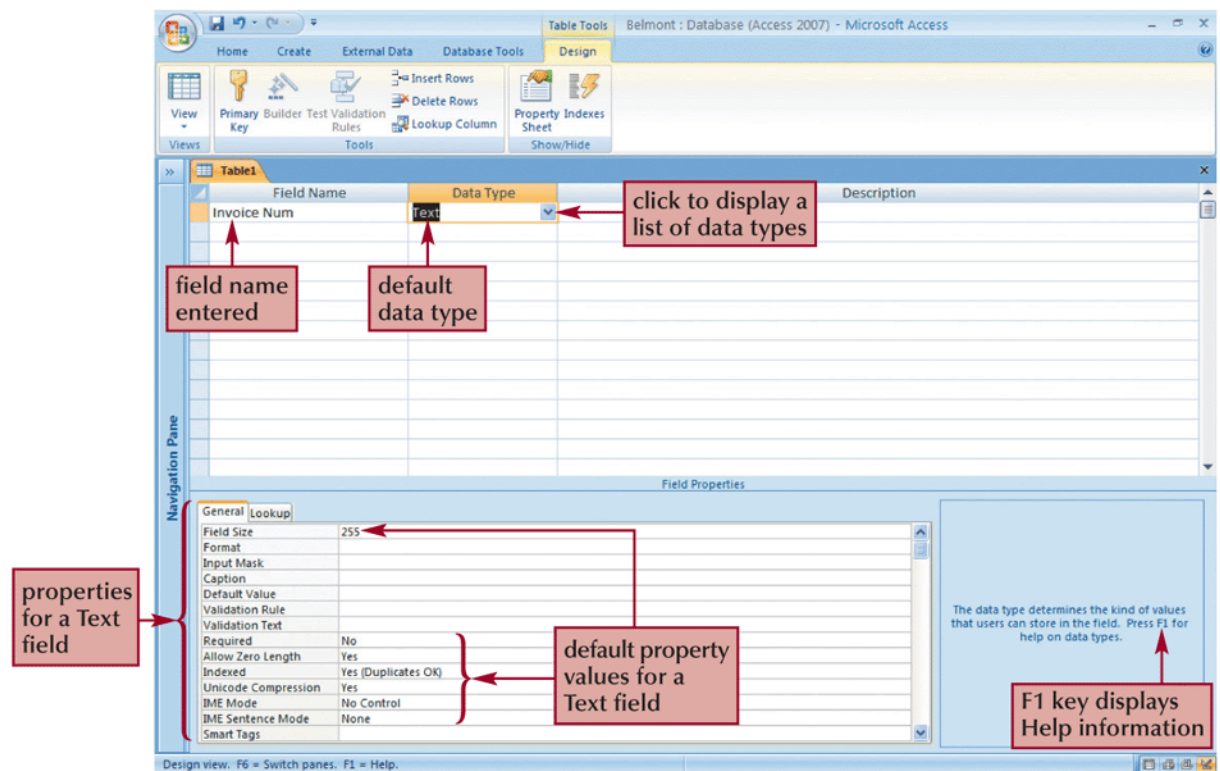
- In the Field Name box, type the name for the field, and then press the Tab key
- Accept the default Text data type, or click the arrow and select a different data type for the field. Press the Tab key
- Enter an optional description for the field, if necessary
- Use the Field Properties pane to type or select other field properties, as appropriate



# Defining a Field in Design View

Figure 2-12

Table window after entering the first field name



# Specifying the Primary Key in Design View

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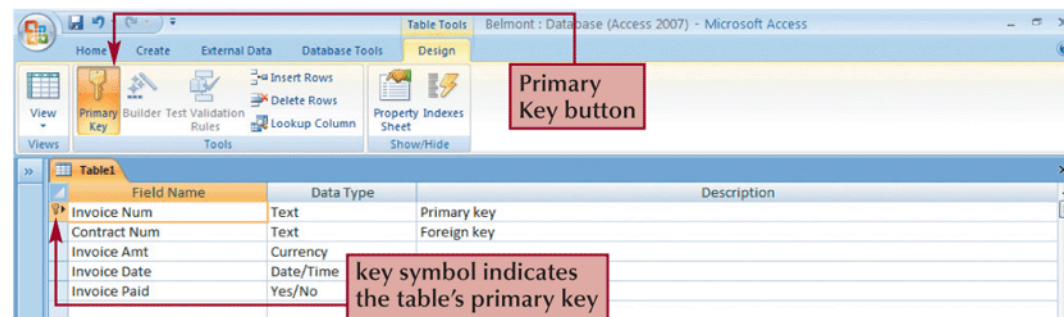
- In the Table window in Design view, click in the row for the field you've chosen to be the primary key. If the primary key will consist of two or more fields, click the row selector for the first field, press and hold down the Ctrl key, and then click the row selector for each additional primary key field
- In the Tools group on the Table Tools Design tab, click the Primary Key button



# Specifying the Primary Key in Design View

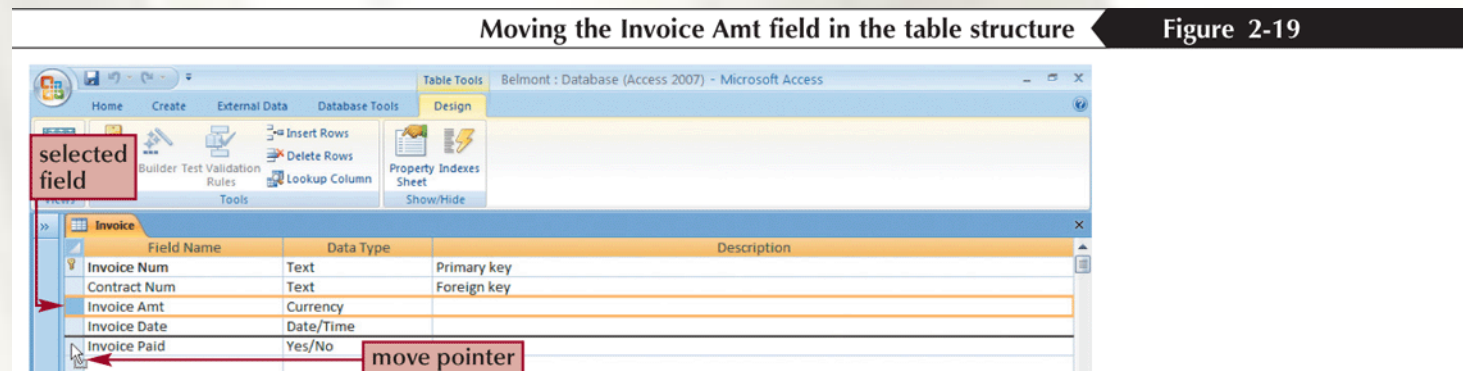
Figure 2-18

Invoice Num field selected as the primary key



# Moving a Field

- To move a field, you use the mouse to drag it to a new location in the Table window in Design view



# Adding a Field Between Two Existing Fields

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- In the Table window in Design view, select the row for the field above which you want to add a new field
- In the Tools group on the Table Tools Design tab, click the Insert Rows button
- Define the new field by entering the field name, data type, optional description, and any property specifications





# Adding a Field Between Two Existing Fields

Figure 2-20 Table structure after inserting a row

Belmont : Database (Access 2007) - Microsoft Access

Field Name	Data Type	Primary key	Description
Invoice Num	Text	Primary key	
Contract Num	Text	Foreign key	
Invoice Date	Date/Time		
Invoice Amt	Currency		
Invoice Paid	Yes/No		

# Importing Data from an Excel Worksheet

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- The **import** process allows you to copy the data from a source without having to open the source file
- Click **External Data** on the Ribbon
- Click the **Excel** button in the Import group to start the wizard



# Importing Data from an Excel Worksheet

Get External Data - Excel Spreadsheet dialog box

Figure 2-26

The screenshot shows the 'Get External Data - Excel Spreadsheet' dialog box. It has a blue title bar and a yellow header area with the text 'Select the source and destination of the data'. The main area is light gray. There are three sections: 'Specify the source of the data.', 'Specify how and where you want to store the data in the current database.', and 'Specify how and where you want to store the data in the current database.' The first section has a text box for 'File name:' containing 'C:\Documents and Settings\My Documents\' and a 'Browse...' button. The second section has three radio button options: 'Import the source data into a new table in the current database.', 'Append a copy of the records to the table:', and 'Link to the data source by creating a linked table.' The third option is selected. The 'Append a copy of the records to the table:' option has a dropdown menu showing 'Contract'. The 'Link to the data source by creating a linked table.' option has a description: 'Access will create a table that will maintain a link to the source data in Excel. Changes made to the source data in Excel will be reflected in the linked table. However, the source data cannot be changed from within Access.' There are 'OK' and 'Cancel' buttons at the bottom. Annotations with red boxes and arrows point to the 'Browse...' button, the 'File name:' text box, the 'Append a copy of the records to the table:' option, and the 'Link to the data source by creating a linked table.' option.

Get External Data - Excel Spreadsheet

Select the source and destination of the data

Specify the source of the data.

File name: C:\Documents and Settings\My Documents\

Browse...

Specify how and where you want to store the data in the current database.

☒ **Import the source data into a new table in the current database.**  
If the specified table does not exist, Access will create it. If the specified table already exists, Access might overwrite its contents with the imported data. Changes made to the source data will not be reflected in the database.

☐ **Append a copy of the records to the table:** Contract  
If the specified table exists, Access will add the records to the table. If the table does not exist, Access will create it. Changes made to the source data will not be reflected in the database.

☐ **Link to the data source by creating a linked table.**  
Access will create a table that will maintain a link to the source data in Excel. Changes made to the source data in Excel will be reflected in the linked table. However, the source data cannot be changed from within Access.

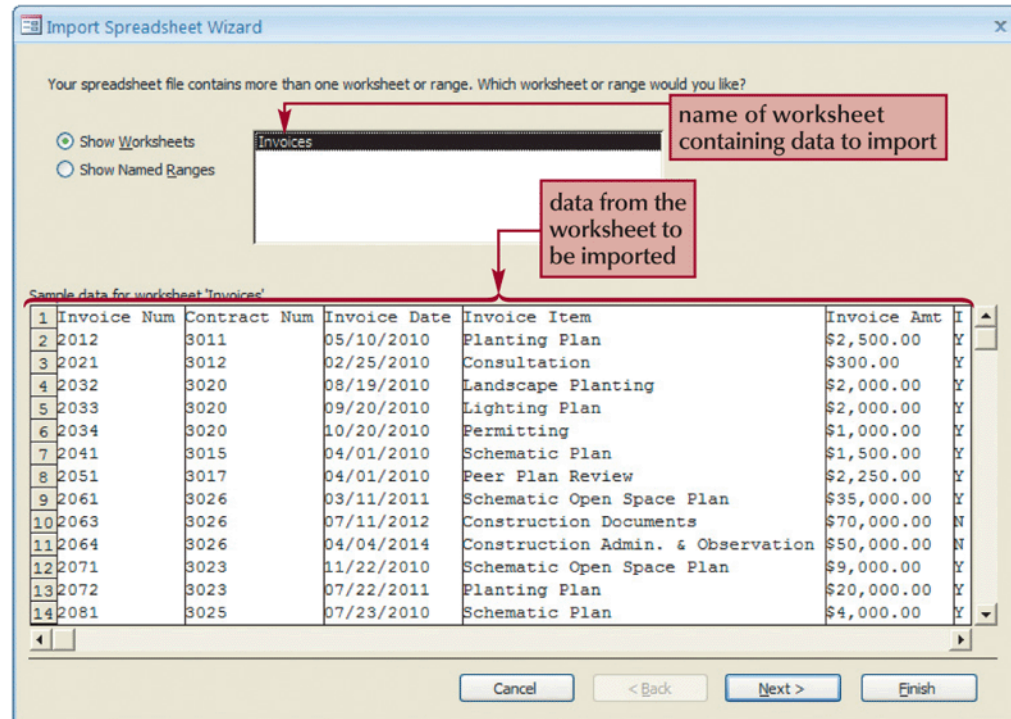
OK Cancel



# Importing Data from an Excel Worksheet

Figure 2-27

First Import Spreadsheet Wizard dialog box



# Importing Data from an Excel Worksheet

**Invoice table after importing data from Excel**

**Figure 2-28**

records are displayed in order by the Invoice Num field values

table contains a total of 176 records

Invoice Num	Contract Num	Invoice Date	Invoice Item	Invoice Amt	Invoice Paid
2011	3011	03/23/2010	Schematic Plan	\$1,500.00	<input checked="" type="checkbox"/>
2012	3011	05/10/2010	Planting Plan	\$2,500.00	<input checked="" type="checkbox"/>
2021	3012	02/25/2010	Consultation	\$300.00	<input checked="" type="checkbox"/>
2031	3020	04/19/2010	Schematic Plan	\$1,500.00	<input checked="" type="checkbox"/>
2032	3020	08/19/2010	Landscape Planting	\$2,000.00	<input checked="" type="checkbox"/>
2033	3020	09/20/2010	Lighting Plan	\$2,000.00	<input checked="" type="checkbox"/>
2034	3020	10/20/2010	Permitting	\$1,000.00	<input checked="" type="checkbox"/>
2041	3015	04/01/2010	Schematic Plan	\$1,500.00	<input checked="" type="checkbox"/>
2051	3017	04/01/2010	Peer Plan Review	\$2,250.00	<input checked="" type="checkbox"/>
2061	3026	03/11/2011	Schematic Open Space Plan	\$35,000.00	<input checked="" type="checkbox"/>
2062	3026	09/12/2011	Permitting	\$10,000.00	<input type="checkbox"/>
2063	3026	07/11/2012	Construction Documents	\$70,000.00	<input type="checkbox"/>
2064	3026	04/04/2014	Construction Admin. & Observation	\$50,000.00	<input type="checkbox"/>
2071	3023	11/22/2010	Schematic Open Space Plan	\$9,000.00	<input checked="" type="checkbox"/>
2072	3023	07/22/2011	Planting Plan	\$20,000.00	<input checked="" type="checkbox"/>
2073	3023	09/21/2012	Construction Observation	\$10,000.00	<input type="checkbox"/>
2081	3025	07/23/2010	Schematic Plan	\$4,000.00	<input checked="" type="checkbox"/>
2082	3025	12/20/2010	Construction Documents	\$8,000.00	<input checked="" type="checkbox"/>
2083	3025	06/24/2011	Construction Observation	\$3,500.00	<input checked="" type="checkbox"/>
2091	3027	06/07/2010	Schematic Plan	\$1,250.00	<input checked="" type="checkbox"/>
2101	3022	07/14/2010	Schematic Plan	\$4,500.00	<input checked="" type="checkbox"/>
2102	3022	11/15/2010	Construction Documents	\$12,000.00	<input checked="" type="checkbox"/>
2103	3022	07/14/2011	Construction Observation	\$5,500.00	<input checked="" type="checkbox"/>
2111	3021	10/12/2010	Schematic Landscape Plan	\$4,500.00	<input checked="" type="checkbox"/>
2112	3021	10/12/2010	Permitting	\$3,000.00	<input checked="" type="checkbox"/>

# Creating a Table by Importing an Existing Table Structure

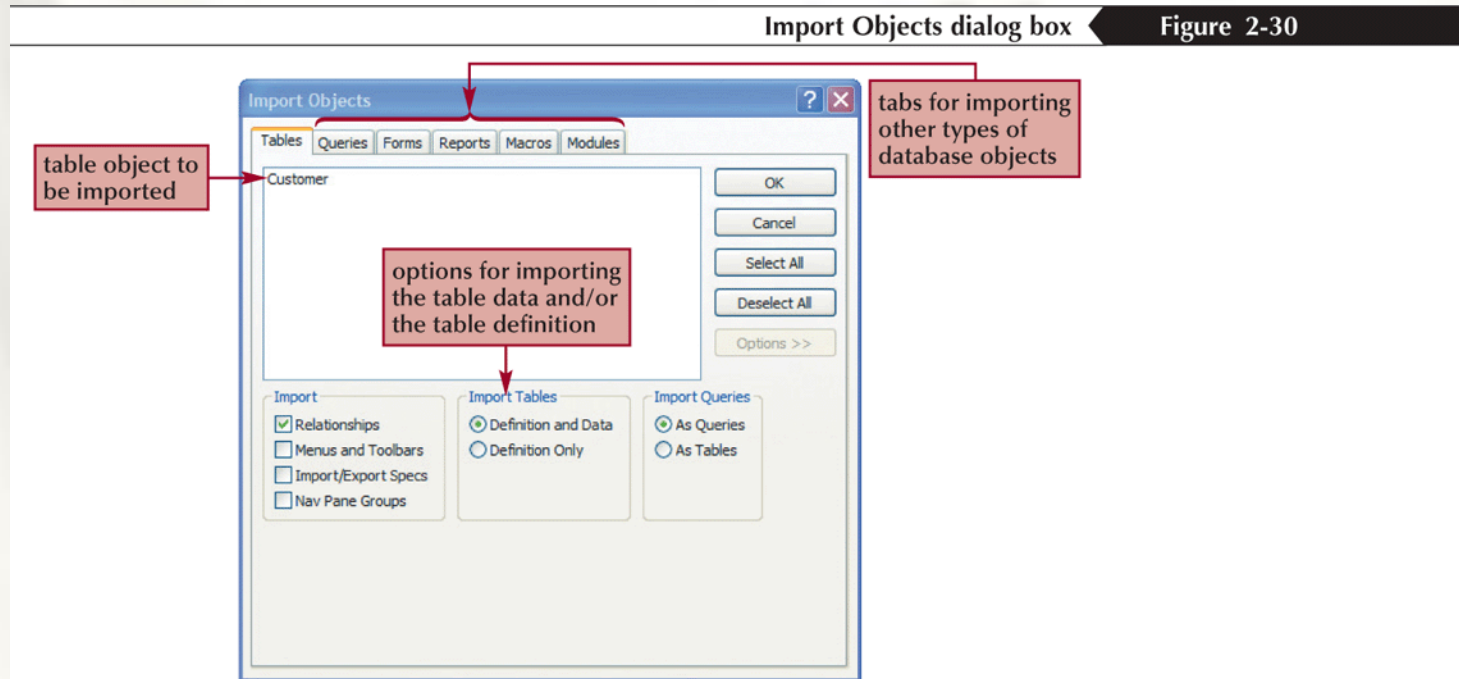
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- Make sure the **External Data** tab is the active tab on the Ribbon
- In the Import group, click the **Access** button
- Click the **Browse** button
- Navigate to the file
- Make sure the **Import tables, queries, forms, reports, macros, and modules into the current database** option button is selected, and then click the **OK** button
- Click the **Options** button





# Creating a Table by Importing an Existing Table Structure



# Deleting a Field from a Table Structure

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- In Datasheet view, select the column heading for the field you want to delete
- In the Fields & Columns group on the Datasheet tab, click the Delete button

*or*

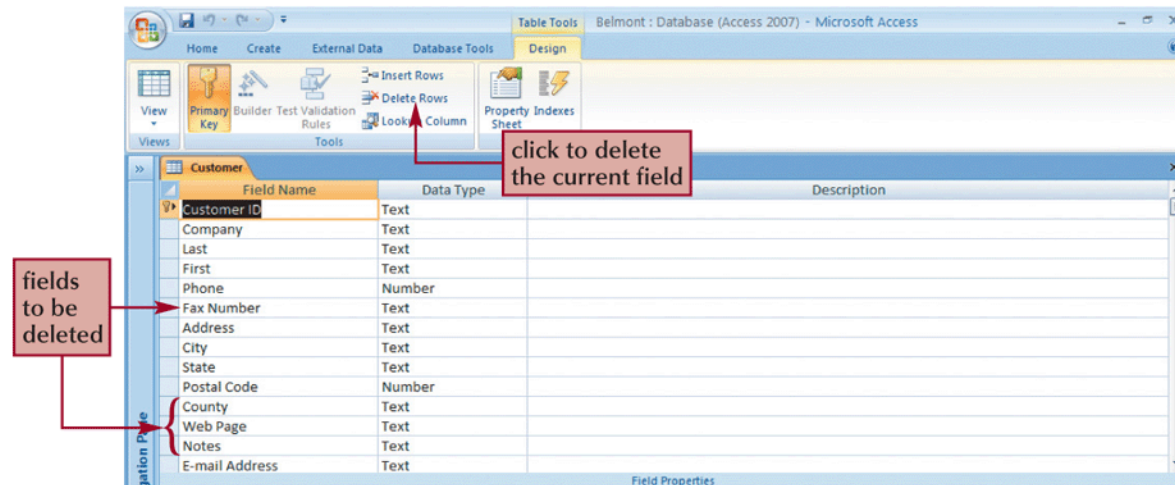
- In Design view, click in the Field Name box for the field you want to delete
- In the Tools group on the Table Tools Design tab, click the Delete Rows button



# Deleting a Field from a Table Structure

Figure 2-32

Customer table in Design view



# Adding Data to a Table by Importing a Text File

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- Click the **External Data** tab on the Ribbon
- In the Import group, click the **Text File** button
- Click the **Browse** button
- Navigate to the file
- Click the **Append a copy of the records to the table** option button
- Select the table
- Click the **OK** button



# Adding Data to a Table by Importing a Text File

Figure 2-37

Second Import Text Wizard dialog box

What delimiter separates your fields? Select the appropriate delimiter and see how your text is affected in the preview below.

Choose the delimiter that separates your fields:

☐ Tab ☐ Semicolon ☒ Comma ☐ Space ☐ Other:

☐ First Row Contains Field Names

Text Qualifier:

fields in the text file are separated by commas

preview of the data being imported

11005		Owen	Hawes	616-392-0622	102 Pineview
11008		Melissa	Caputo	269-985-1122	302 Main St
11014		Amol	Mehta	616-396-1972	54 Lakeshore
11015		John	Weiss	616-637-7783	456 Wincheste
11020	Battle Creek Dental Partners	Harry	Billings	269-963-0808	587 Longmeado
11027		Karen	O'Brien	517-483-9244	38 Langley Rd
11030	Finn's on the Waterfront	Devin	Finnerty	616-393-1228	78 East 8th S
11031	Happy Haven Day Care	Kathy	Rowe	616-842-4603	29 Graham's L
11032		Pam	Wallner	269-857-1276	80 Cedar St
11038	M. Grant Investment Company	Alex	Engber	517-482-1400	505 Washingto
11040	RiverView Development Company	Charles	Nowak	616-988-0777	144 E Tower A
11042		Michael	Ingram	269-337-9208	10 Lincoln Dr
11043	Monroe State College	Rachel	Kirk	616-988-1320	40 Monroe St
11045	Kalamazoo Neighborhood Development	James	Blackhawk	269-343-7509	3047 Millbroo

Advanced... Cancel < Back Next > Finish

# Defining Table Relationships

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- One of the most powerful features of a relational database management system is its ability to define relationships between tables
- You use a common field to relate one table to another

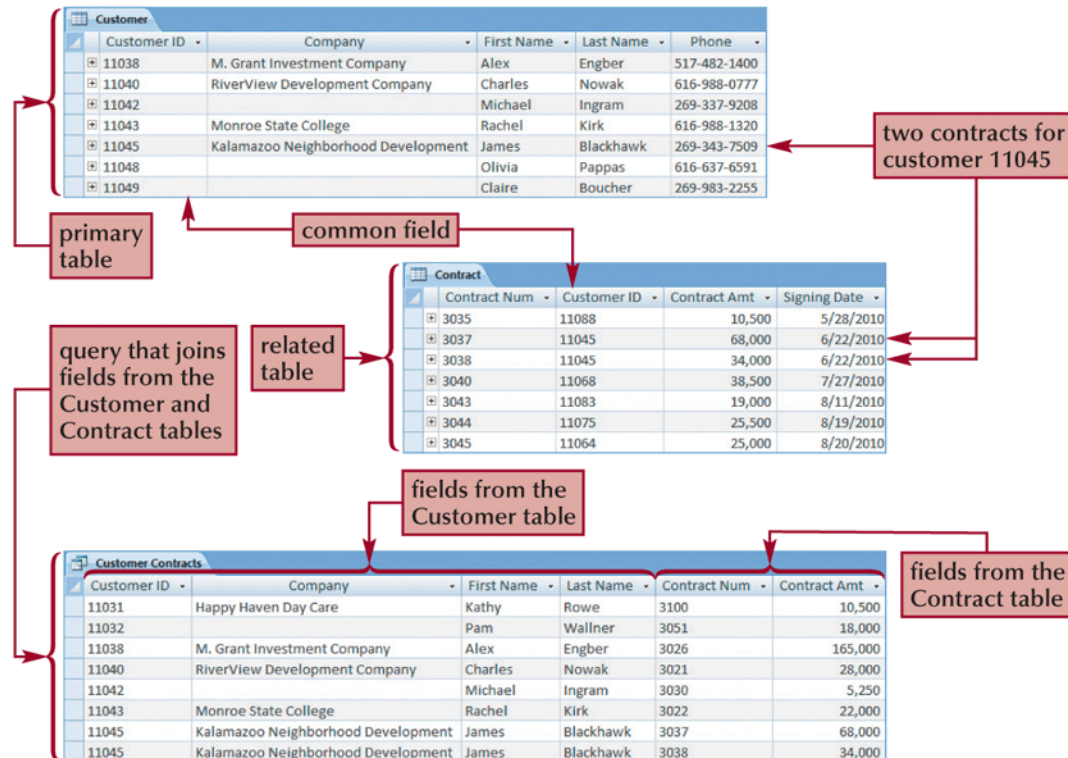




# Defining Table Relationships

Figure 2-39

One-to-many relationship and sample query



# Defining Table Relationships

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- A **one-to-many relationship** exists between two tables when one record in the first table matches zero, one, or many records in the second table, and when one record in the second table matches at most one record in the first table
  - **Primary table**
  - **Related table**



# Defining Table Relationships

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- **Referential integrity** is a set of rules that Access enforces to maintain consistency between related tables when you update data in a database
- The **Relationships window** illustrates the relationships among a database's tables
- Click the **Database Tools** tab on the Ribbon
- In the Show/Hide group on the Database Tools tab, click the **Relationships** button



# Defining Table Relationships

Figure 2-40 Show Table dialog box

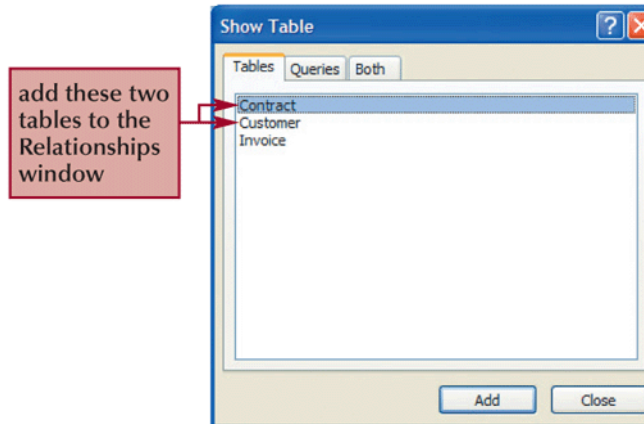
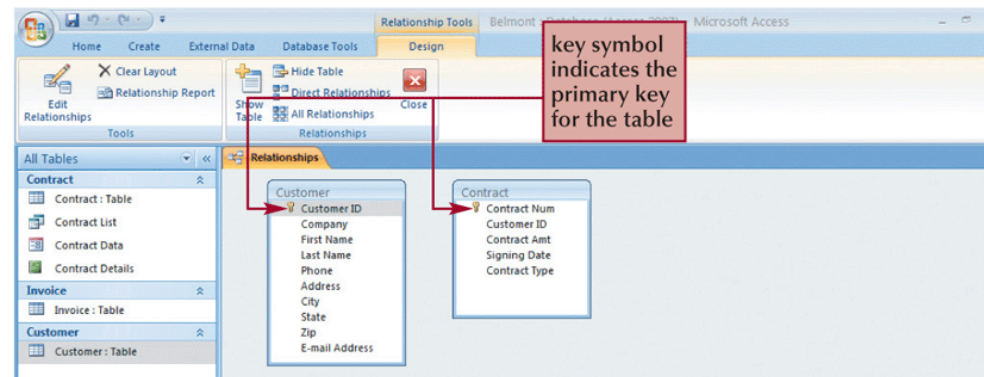
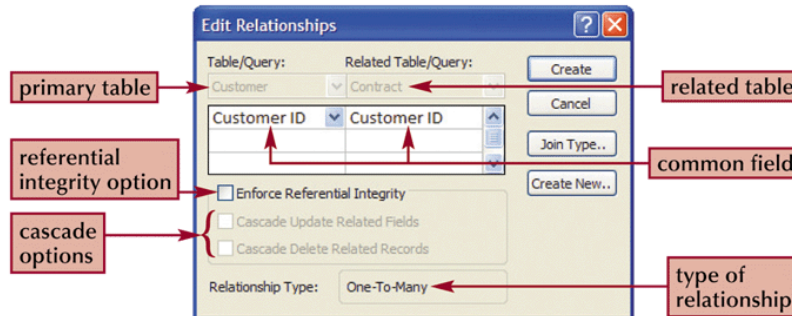


Figure 2-41 Field list boxes for the two tables



# Defining Table Relationships

Edit Relationships dialog box **Figure 2-42**



**Figure 2-44** Both relationships defined

