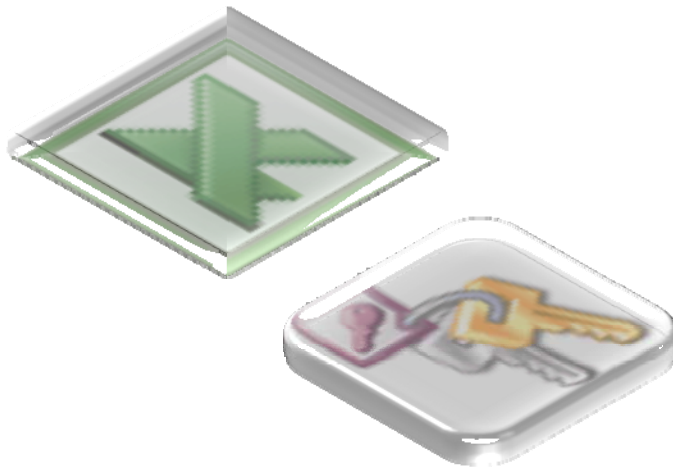


Helen's School

Microsoft Excel & Access (Database)

Basic Course



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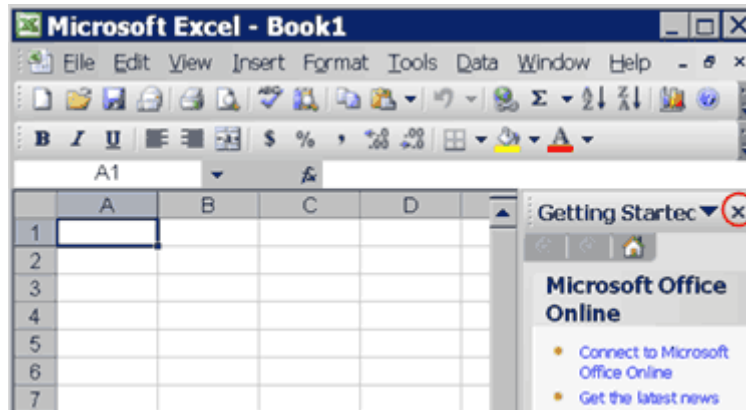
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I. Microsoft Excel

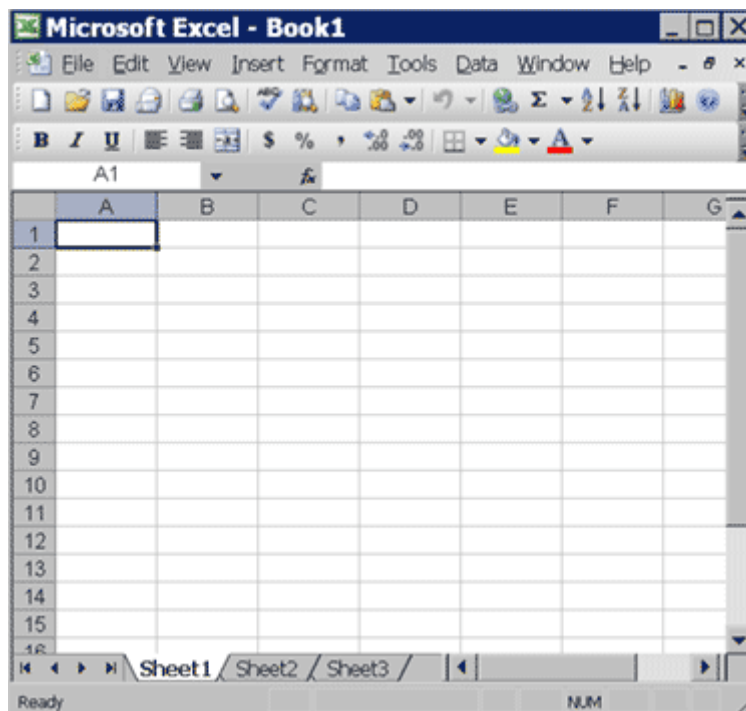
1. Lesson 1: Entering Text and Numbers

1.1. The Microsoft Excel Window

This tutorial teaches Microsoft Excel basics. Although knowledge of how to navigate in a Windows environment is helpful, this tutorial was created for the computer novice. To begin, open Microsoft Excel. Then, if necessary, click the  in the upper right corner of the task pane to close the task pane.



The screen shown here will appear.



The Title Bar



This lesson will familiarize you with the Microsoft Excel screen. You will start with the Title bar, which is located at the very top of the screen. On the Title bar, Microsoft Excel displays the name of the workbook you are currently using. At the top of your screen, you should see "Microsoft Excel - Book1" or a similar name.

The Menu Bar



The Menu bar is directly below the Title bar. The menu begins with the word File and continues with Edit, View, Insert, Format, Tools, Data, Window, and Help. You use a menu to give instructions to the software. Point with your mouse to a menu option and click the left mouse button. A drop-down menu opens. You can now use the left and right arrow keys on your keyboard to move left and right across the Menu bar. You can use the up and down arrow keys to move up and down the drop-down menu. To choose an option, highlight the item on the drop-down menu and press Enter. An ellipse after a menu item signifies additional options; if you choose that option, a dialog box opens.

Do the following exercise, which demonstrates using the Microsoft Excel menu bar.

1. Point to the word *File*, which is located on the Menu bar.
2. Click your left mouse button.
3. Press the right arrow key until Help is highlighted.
4. Press the left arrow key until Format is highlighted.
5. Press the down arrow key until Style is highlighted. Press the up arrow key until Cells is highlighted.
6. Press Enter to choose the *Cells* menu option.
7. Point to Cancel and click the left mouse button to close the dialog box.

When using Microsoft Excel, you can set an option to tell Microsoft Excel to always show full menus or to show only the most frequently and recently used options. All the lessons in this tutorial assume you have your menus set to Always Show Full Menus. To set your menu to display full menus:

1. Point to the word Tools, which is located on the menu bar.
2. Click your left mouse button.
3. Press the down arrow until customize is highlighted.
4. Press Enter.
5. Choose the Options Tab by clicking on it.
6. If Always Show Full Menus does not have a check mark in it, click in the Always Show Full Menus box.
7. Click Close to close the dialog box.

1.2. Toolbars



The Standard Toolbar

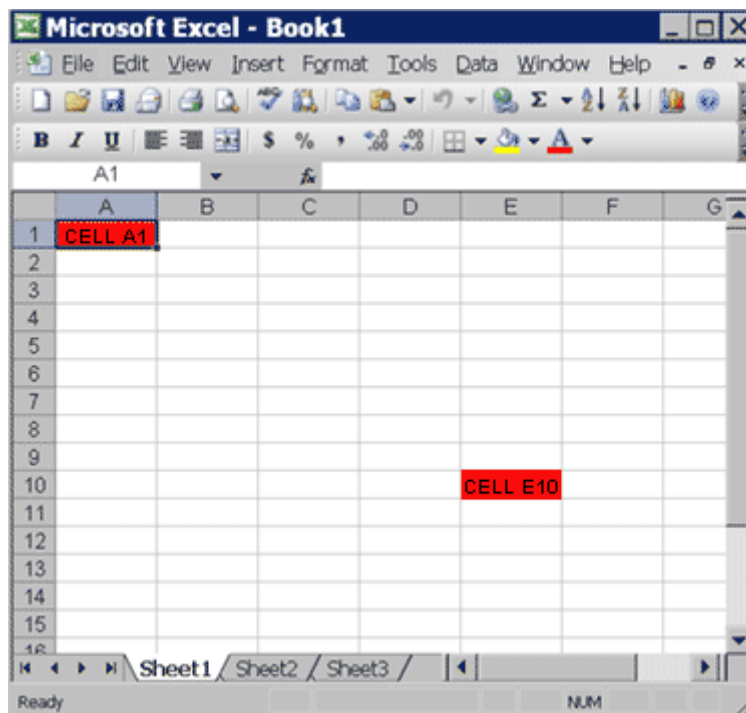


The Formatting Toolbar

Toolbars provide shortcuts to menu commands. Toolbars are generally located just below the Menu bar. Before proceeding with this lesson, make sure the toolbars you will use -- Standard and Formatting -- are available. Follow the steps outlined here:

1. Point to *View*, which is located on the Menu bar.
2. Click the left mouse button.
3. Press the down arrow key until Toolbars is highlighted.
4. Press the right arrow key.
5. Both Standard and Formatting should have a check mark next to them. If both have a check mark next to them, press Esc two times to close the menu. If either does not have a check mark, press the down arrow key until Customize is highlighted.
6. Press Enter. The Customize dialog box opens.
7. Choose the Toolbars tab.
8. Point to the box or boxes next to the unchecked word or words, Standard and/or Formatting, and click the left mouse button. A check mark should appear. **Note:** You turn the check mark on and off by clicking the left mouse button.
9. Point to Close and click the left mouse button to close the dialog box.

1.3. Worksheets



Microsoft Excel consists of worksheets. Each worksheet contains columns and rows. The columns are lettered A to IV; the rows are numbered 1 to 65536. The combination of a column coordinate and a row coordinate make up a cell address. For example, the cell located in the upper left corner of the worksheet is cell A1, meaning column A, row 1. Cell E10 is located under column E on row 10. You enter your data into the cells on the worksheet.

1.3.1.The Formula Bar

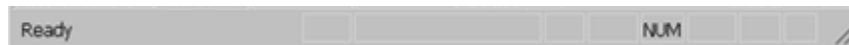


Formula Bar

If the Formula bar is turned on, the cell address displays in the Name box on the left side of the Formula bar. Cell entries display on the right side of the Formula bar. Before proceeding, make sure the Formula bar is turned on.

1. Point to View, which is located on the Menu bar.
2. Click the left mouse button. A drop-down menu opens. On the drop-down menu, if Formula Bar has a check mark next to it, the Formula bar is turned on. Press the Esc key to close the drop-down menu.
3. If Formula Bar does not have a check mark next to it, press the down arrow key until Formula Bar is highlighted; then press Enter. The Formula bar should now appear below the toolbars.
4. Note that the current cell address displays on the left side of the Formula bar.

1.3.2.The Status Bar



Status Bar

If the Status bar is turned on, it appears at the very bottom of the screen. Before proceeding, make sure the Status bar is turned on.

1. Point to View, which is located on the Menu bar.
2. Click the left mouse button. A drop-down menu opens.
3. On the drop-down menu, if Status Bar has a check mark next to it, it is turned on. Press the Esc key to close the drop-down menu.
4. If Status Bar does not have a check mark next to it, press the down arrow key until Status Bar is highlighted; then press Enter. The Status bar should now appear at the bottom of the screen.

Notice the word "Ready" on the Status bar at the lower left side of the screen. The word "Ready" tells you that Excel is in the Ready mode and awaiting your next command. Other indicators appear on the Status bar in the lower right corner of the screen. Here are some examples:

The Num Lock key is a toggle key. Pressing it turns the numeric keypad on and off. You can use the numeric keypad to enter numbers as if you were using a calculator. The letters "NUM" on the Status bar in the lower right corner of the screen indicate that the numeric keypad is on.

- Press the Num Lock key several times and note how the indicator located on the Status bar changes.

The Caps Lock key is also a toggle key. Pressing it turns the caps function on and off. When the caps function is on, your entry appears in capital letters.

- Press the Cap Lock key several times and note how the indicator located on the Status bar changes.

Other functions that appear on the Status bar are Scroll Lock and End. Scroll Lock and End are also toggle keys. Pressing the key toggles the function between on and off. Scroll Lock causes the movement keys to move the

window without moving the cell pointer. End lets you jump around the screen. We will discuss both of these later in more detail.

Make sure the Scroll Lock and End indicators are off and complete the following exercises.

1.3.3.The Down Arrow Key

You can use the down arrow key to move downward one cell at a time.

1. Press the down arrow key several times.
2. Note that the cursor moves downward one cell at a time.

1.3.4.The Up Arrow Key

You can use the Up Arrow key to move upward one cell at a time.

1. Press the up arrow key several times.
2. Note that the cursor moves upward one cell at a time.

1.3.5.The Tab Key

You can use the Tab key to move across the page to the right, one cell at a time.

1. Move to cell A1.
2. Press the Tab key several times.
3. Note that the cursor moves to the right one cell at a time.

1.3.6.The Shift+Tab Keys

You can hold down the Shift key and then press the Tab key to move to the left, one cell at a time.

1. Hold down the Shift-key and then press Tab.
2. Note that the cursor moves to the left one cell at a time.

1.3.7.The Right and Left Arrow Keys

You can use the right and left arrow keys to move right or left one cell at a time.

1. Press the right arrow key several times.
2. Note that the cursor moves to the right.
3. Press the left arrow key several times.
4. Note that the cursor moves to the left.

1.3.8.Page Up and Page Down

The Page Up and Page Down keys move the cursor up and down one page at a time.

1. Press the Page Down key.
2. Note that the cursor moves down one page.
3. Press the Page Up key.

4. Note that the cursor moves up one page.

1.3.9. The End Key



The Status Bar

The End key, used in conjunction with the arrow keys, causes the cursor to move to the far end of the spreadsheet in the direction of the arrow.

1. Press the End key.
2. Note that "END" appears on the Status bar in the lower right corner of the screen.
3. Press the right arrow key.
4. Note that the cursor moves to the farthest right area of the screen.
5. Press the END key again.
6. Press the down arrow key. Note that the cursor moves to the bottom of the screen.
7. Press the End key again.
8. Press the left arrow key. Note that the cursor moves to the farthest left area of the screen.
9. Press the End key again.
10. Press the up arrow key. Note that the cursor moves to the top of the screen.

Note: If you have entered data into the worksheet, the End key moves you to the end of the data area.

1.3.10. The Home Key

The Home key, used in conjunction with the End key, moves you to cell A1 -- or to the beginning of the data area if you have entered data.

1. Move the cursor to column J.
2. Stay in column J and move the cursor to row 20.
3. Press the End key.
4. Press Home.
5. You should now be in cell A1.

1.4. Moving Quickly Around the Worksheet

The following are shortcuts for moving quickly from one cell to a cell in a different part of the worksheet.

1.4.1. Go to -- F5

The F5 function key is the "Go To" key. If you press the F5 key while in the Ready mode, you are prompted for the cell to which you wish to go. Enter the cell address, and the cursor jumps to that cell.

1. Press F5. The Go To dialog box opens.
2. Type **J3**.
3. Press Enter. The cursor should move to cell J3.

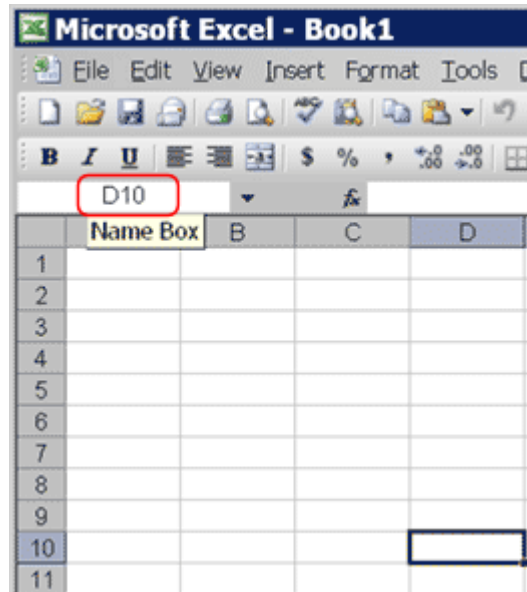
1.4.2. Go to -- Ctrl-G

You can also use Ctrl-G to go to a specific cell.

1. Hold down the Ctrl key while you press "g" (Ctrl-g). The Go To dialog box opens.
2. Type **C4**.
3. Press Enter. You should now be in cell C4.

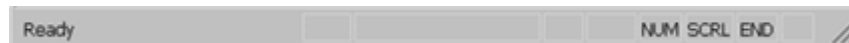
1.4.3.Name Box

You can also use the Name box to go to a specific cell.



1. Type **D10** in the Name box
2. Press Enter. You should now be in cell D10.

1.4.4.Scroll Lock

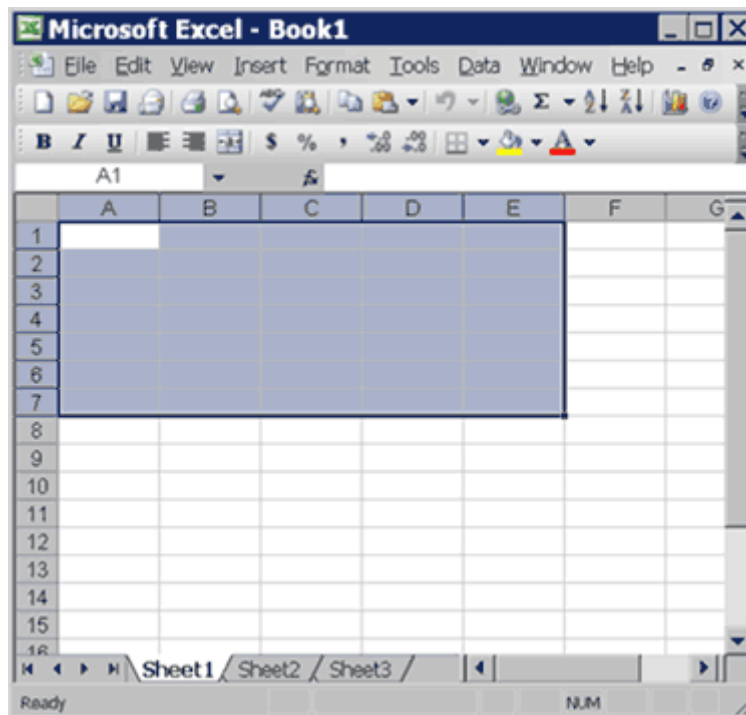


The Status Bar

Scroll Lock moves the window, but not the cell pointer.

1. Press the Page Down key.
2. Press Scroll Lock. Note "SCRL" appears on the Status bar in the lower right corner of the screen.
3. Press the up arrow key several times. Note that the cursor stays in the same position and the window moves upward.
4. Press the down arrow key several times. Note that the cursor stays in the same position and the window moves downward.
5. Press Scroll Lock to turn the Scroll Lock function off.
6. Hold down the Ctrl key and press Home to move to cell A1.

1.5. Selecting Cells



If you wish to perform a function on a group of cells, you must first select those cells by highlighting them. To highlight cells A1 to E1:

1. Place the cursor in cell A1.
2. Press the F8 key. This anchors the cursor.
3. Note that "EXT" appears on the Status bar in the lower right corner of the screen. You are in the Extend mode.
4. Click in cell E7. Cells A1 to E7 should now be highlighted.
5. Press Esc and click anywhere on the worksheet to clear the highlighting.

1.5.1. Alternative Method: Selecting Cells by Dragging

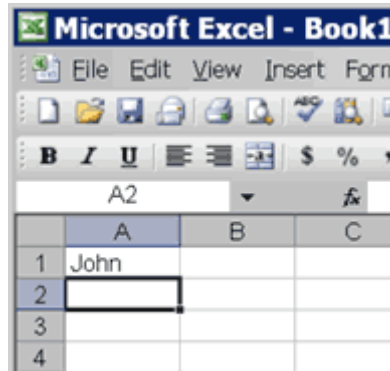
You can also highlight an area by holding down the left mouse button and dragging the mouse over the area. In addition, you can select noncontiguous areas of the worksheet by doing the following:

1. Place the cursor in cell A1.
2. Hold down the Ctrl key. Do not release it until you are told. Holding down the Ctrl key enables you to select noncontiguous areas of the worksheet.
3. Press the left mouse button.
4. While holding down the left mouse button, use the mouse to move from cell A1 to E7.
5. Continue to hold down the Ctrl key, but release the left mouse button.
6. Using the mouse, place the cursor in cell G8.
7. Press the left mouse button.
8. While holding down the left mouse button, move to cell I17. Release the left mouse button.
9. Release the Ctrl key. Cells A1 to E7 and cells G8 to I17 are highlighted.
10. Press Esc and click anywhere on the worksheet to remove the highlighting.

1.6.Entering Data

In this lesson, you are going to learn how to enter data into your worksheet. First, you place the cursor in the cell in which you would like to enter data. Then you type the data and press Enter.

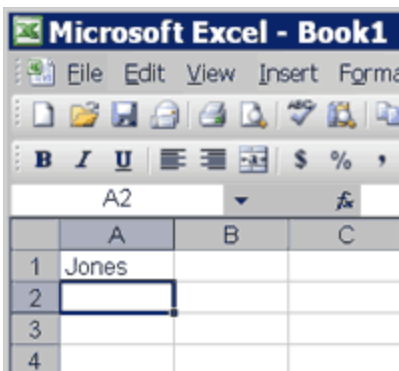
1. Place the cursor in cell A1.
2. Type **John Jordan**.
3. The Backspace key erases one character at a time. Erase "Jordan" by pressing the backspace key until Jordan is erased.
4. Press Enter. The name "John" should appear in cell A1.



1.6.1.Editing a Cell

After you enter data into a cell, you can edit it by pressing F2 while you are in the cell you wish to edit.

1. Move the cursor to cell A1.
2. Press F2.
3. Change "John" to "Jones."
4. Use the backspace key to delete the "n" and the "h."
5. Type **nes**.
6. Press Enter.

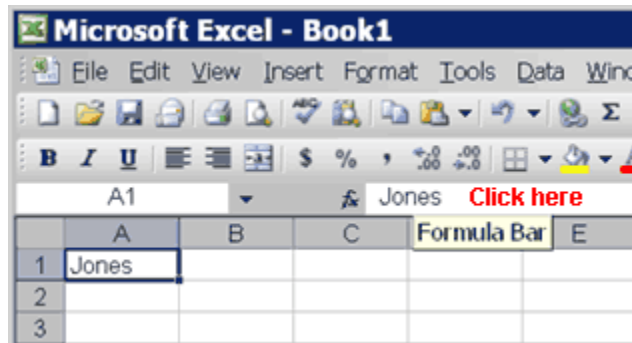


1.6.2.Alternate Method: Editing a Cell by Using the Formula Bar

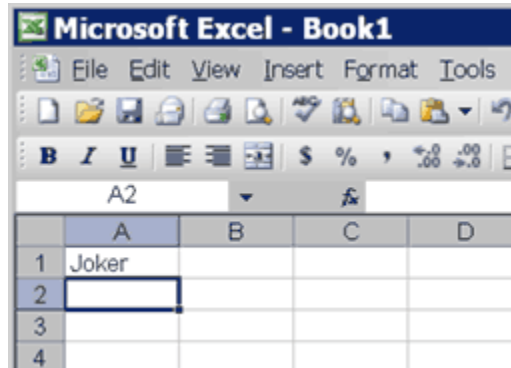
You can also edit the cell by using the Formula bar. You can change "Jones" to "Joker" as follows:

1. Move the cursor to cell A1.

- Click in the formula area of the Formula bar.



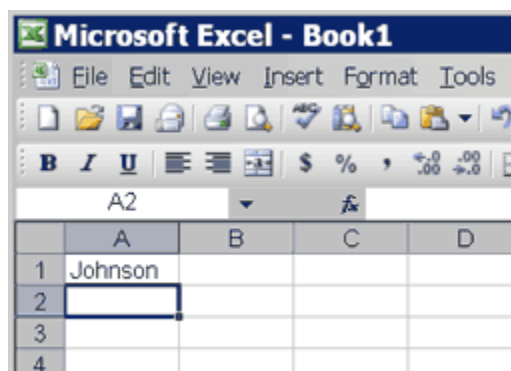
- Use the backspace key to erase the "s," "e," and "n."
- Type **ker**.
- Press Enter.



1.6.3. Alternate Method: Editing a Cell by Double-Clicking in the Cell

You can change "Joker" to "Johnson" as follows:

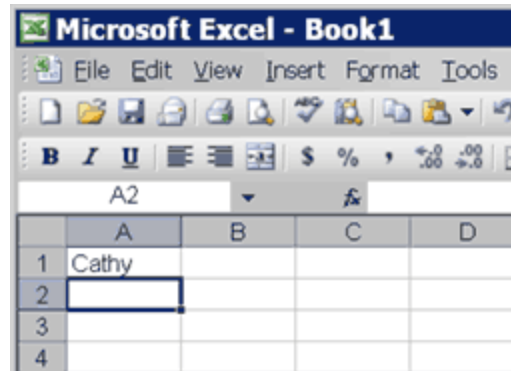
- Move the cursor to cell A1.
- Double-click in cell A1.
- Press the End key. Your cursor is now at the end of your text.
- Use the backspace to erase "r," "e," and "k."
- Type **hnson**.
- Press Enter.



1.6.4.Changing a Cell Entry

Typing in a cell while you are in the Ready mode replaces the old cell entry with the new information you type.

1. Move the cursor to cell A1.
2. Type **Cathy**.
3. Press Enter. The name "Cathy" should replace "Johnson."



1.6.5.Wrapping Text

When you enter text that is too long to fit in a cell into a cell, it overlaps the next cell. If you do not want it to overlap the next cell you can wrap the text.

1. Move to cell A2.
2. Type **Text too long to fit**.
3. Press Enter.
4. Return to cell A2.
5. Choose *Format > Cells* from the menu.
6. Choose the Alignment tab.
7. Click Wrap Text.
8. Click OK. The text wraps.

1.6.6.Deleting a Cell Entry

To delete an entry in a cell or a group of cells, you place the cursor in the cell or highlight the group of cells and press Delete.

1. Place the cursor in cell A2.
2. Press the Delete key.

1.7.Entering Numbers as Labels or Values

In Microsoft Excel, you can enter numbers as labels or as values. Labels are alphabetic, alphanumeric, or numeric text on which you do not perform mathematical calculations. Values are numeric text on which you perform mathematical calculations. If you have a numeric entry, such as an employee number, on which you do not perform mathematical calculations, enter it as a label by typing a single quotation mark first.

Enter a number:

1. Move the cursor to cell B1.
2. Type **100**.
3. Press Enter.

The number 100 appears in cell B1 as a numeric value. You can perform mathematical calculations using this cell entry. Note that by default the number is right-aligned.

Enter a value:

1. Move the cursor to cell C1.
2. Type '**100**'.
3. Press Enter.

The number 100 appears in cell C1 as a label. Note that by default the cell entry is left-aligned and a green triangle appears in the upper left corner of the cell.

1.7.1.Smart Tags

When you make an entry that Microsoft Excel believes you may want to change, a smart tag appears. Smart tags give you the opportunity to make changes easily. Cells with smart tag in them appear with a green triangle in the upper left corner. When you place your cursor in the cell, the Trace Error icon appears. Click the Trace Error icon and options appear. When you made your entry in cell C1 in the previous section, a smart tag should have appeared.

1. Move to cell C1.
2. Click the Trace Error icon. An options list appears. You can convert the label to a number, obtain help, ignore the error etc.

1.8.Saving a File

This is the end of Lesson1. To save your file:

1. Choose *File > Save* from the menu.
2. Go to the directory in which you want to save your file.
3. Type **lesson1** in the File Name field.
4. Click Save.

1.9.Closing Microsoft Excel

Close Microsoft Excel.

1. Choose *File > Close* from the menu.

2. Lesson 2: Formatting Text and Performing Mathematical Calculations

In this lesson, you are going to learn how to format text and perform basic mathematical calculations. To start, open a blank Microsoft Excel workbook.

2.1. Choosing a Default Font

Microsoft Excel enables you to choose a default font. The default font is the style of typeface that Excel will use unless you specify a different style. For the exercises in this lesson, you want your font to be set to Arial, Regular, and Size 10. To set your font to Arial, Regular, and Size 10:

1. Choose *Format > Cells* from the menu.
2. Choose the Font tab.
3. In the Font box, choose Arial.
4. In the Font Style box, choose Regular.
5. In the Size box, choose 10.
6. If there is no check mark in the Normal Font box, click to place a check mark there. Your selections are now the default.
7. Click OK.

2.2. Adjusting the Standard Column Width

When you open Microsoft Excel, the width of each cell is set to a default width. This width is called the standard column width. You need to change the standard column width to complete your exercises. To make the change, follow these steps:

1. Choose *Format > Column > Standard Width* from the menu. The Standard Width dialog box opens.
2. Type **25** in the Standard Column Width field. Click OK. The width of every cell on the worksheet should now be set to 25.
3. Move to cell A1.
4. Type **Cathy**.
5. Press Enter.

2.3. Cell Alignment

The name "Cathy" is aligned with the left side of the cell. You can change the cell alignment.

	A	B
1	Cathy	
2		

2.3.1. Centering by Using the Menu

To center the name Cathy, follow these steps:

1. Move the cursor to cell A1.
2. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Alignment tab.
4. Click to open the drop-down box associated with the Horizontal field. After the drop-down box is opened, click Center.

- Click OK to close the dialog box. The name "Cathy" is centered.

	A	B
1	Cathy	
2		

2.3.2.Right-Aligning by Using the Menu

To right-align the name "Cathy," follow these steps:

- Move the cursor to cell A1.
- Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
- Choose the Alignment tab.
- Click to open the drop-down box associated with the Horizontal field. After the drop-down box opens, click Right (Indent).
- Click OK to close the dialog box. The name "Cathy" is right-aligned.

	A	B
1	Cathy	
2		

2.3.3.Left-Aligning by Using the Menu

To left-align the name "Cathy," follow these steps:

- Move the cursor to cell A1.
- Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
- Choose the Alignment tab.
- Click to open the drop-down box associated with the Horizontal field. After the drop-down box opens, click Left (Indent).
- Click OK to close the dialog box. The name "Cathy" is left-aligned.

	A	B
1	Cathy	
2		

2.3.4.Alternate Method: Alignment by Using the Formatting Toolbar

Using the Formatting toolbar, you can quickly perform tasks. You can use the Formatting toolbar to change alignment.

2.3.5.Centering by Using the Toolbar

To center the name "Cathy," follow these steps:

- Move the cursor to cell A1.
- Click the Center icon, which is located on the Formatting toolbar.



The red circle designates the Align Center icon.

2.3.6.Right-Aligning by Using the Toolbar

You can right-align the name "Cathy" by following these steps:

1. Move the cursor to cell A1.
2. Click the Align Right icon, which is located on the Formatting toolbar.



The red circle designates the Align Right icon.

2.3.7.Left-Aligning by Using the Toolbar

You can left-align the name "Cathy" by following these steps:

1. Move the cursor to cell A1.
2. Click the Align Left icon, which is located on the Formatting toolbar.



The red circle designates the Align Left icon.

2.3.8.Adding Bold, Underline, and Italic

You can bold, underline, or italicize text in Microsoft Excel. You can also combine these features -- in other words, you can bold, underline, *and* italicize a single piece of text.

In the exercises that follow, you will learn three different methods for bolding, italicizing, or underlining text in Microsoft Excel. You will learn to bold, italicize, and underline by using the menu, the icons, and the shortcut keys.

2.3.9.Adding Bold by Using the Menu

1. Type **Bold** in cell A2.
2. Click the check mark located on the Formula bar. Clicking on the check mark is similar to pressing Enter.



3. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
4. Choose the Font tab.
5. Click Bold in the Font Style box.
6. Click OK. The word "Bold" should now be bolded.

2.3.10. Adding Italic by Using the Menu

1. Type **Italic** in cell B2.
2. Click the check mark located on the Formula bar. Clicking on the check mark is similar to pressing Enter.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
4. Click Italic in the Font style box.
5. Click OK. The word "Italic" is italicized.

2.3.11. Adding Underline by Using the Menu

Microsoft Excel provides several types of underlines. The exercise that follows illustrates some of them.

2.3.12. Single Underline

1. Type **Underline** in cell C2.
2. Click the check mark located on the Formula bar. Clicking on the check mark is similar to pressing Enter.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
4. Click to open the drop-down menu associated with the Underline box.
5. Click Single.
6. Click OK. The cell entry now has a single underline.

2.3.13. Double Underline

1. Type **Underline** in cell D2.
2. Click the check mark located on the Formula bar.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
4. Click to open the drop-down menu associated with the Underline field.
5. Click Double.
6. Click OK. The cell entry now has a double underline.

2.3.14. Single Accounting

1. Type **Underline** in cell E2.
2. Click the check mark located on the Formula bar.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box will open.
4. Click to open the drop-down menu associated with the Underline field.
5. Click Single Accounting.
6. Click OK. The cell entry now has a single accounting underline.

2.3.15. Double Accounting

1. Type **Underline** in cell F2.
2. Click the check mark located on the Formula bar.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box will open.
4. Click to open the drop-down menu associated with the Underline field.
5. Click Double Accounting.
6. Click OK. The cell entry now has a double accounting underline.

2.3.16. Adding Bold, Underline, and Italic by Using the Menu

1. Move the cursor to cell G3.
2. Type **All three**.
3. Click the check mark located on the Formula bar.
4. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
5. Choose the Font tab.
6. Click Bold Italic in the Font Style box.
7. Click to open the drop-down menu associated with the Underline field. Then click Single.
8. Click OK. The words "All three" are now bolded, italicized, and underlined.

2.3.17. Removing Bolding and Italics by Using the Menu

1. Highlight cells A2 to B2. Place your cursor in cell B2. Press the F8 key. Press the right arrow key once.
2. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
3. Click Regular in the Font style box.
4. Click OK. Cell A2 is no longer be bolded. Cell B2 is no longer italicized.

2.3.18. Removing an Underline by Using the Menu

1. Move to cell C2.
2. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
3. Click to open the drop-down menu associated with the Underline field. Then click None.
4. Click OK. The underdelined is removed.

2.3.19. Alternate Method: Adding Bold by Using the Icon

1. Type **Bold** in cell A3.
2. Click the check mark located on the Formula bar.



3. Click the Bold icon, which is on the Formatting toolbar.
4. Click again on the Bold icon if you wish to remove the bolding.

2.3.20. Alternate Method: Adding Italic by Using the Icon

1. Type **Italic** in cell B3.
2. Click the check mark located on the Formula bar.



3. Click the Italic icon, which is on the Formatting toolbar.
4. Click again on the Italic icon if you wish to remove the italics.

2.3.21. Alternate Method: Adding Underline by Using the Icon

1. Type **Underline** in cell C3.
2. Click the check mark located on the Formula bar.



3. Click the Underline icon, which is on the Formatting toolbar.
4. Click again on the Underline icon if you wish to remove the underline.

2.3.22. Alternate Method: Adding Bold, Underline, and Italic by Using Icons

1. Type **All Three** in cell D3.
2. Click the check mark located on the Formula bar.
3. Click the Bold icon.
4. Click the Italic icon.

5. Click the Underline icon.

2.3.23. Alternate Method: Adding Bold by Using Shortcut Keys

1. Type **Bold** in cell A4.
2. Click the check mark located on the Formula bar.
3. Hold down the Ctrl key while pressing "b" (Ctrl-b).
4. Press Ctrl-b again if you wish to remove the bolding.

2.3.24. Alternate Method: Adding Italic by Using Shortcut Keys

1. Type **Italic** in cell B4.
2. Click the check mark located on the Formula bar.
3. Hold down the Ctrl key while pressing "i" (Ctrl-i).
4. Press Ctrl-i again if you wish to remove the italic formatting.

2.3.25. Alternate Method: Adding Underline by Using Shortcut Keys

1. Type **Underline** in cell C4.
2. Click the check mark located on the Formula bar.
3. Hold down the Ctrl key while pressing "u" (Ctrl-u).
4. Press Ctrl-u again, if you wish to remove the underline.

2.3.26. Alternate Method: Adding Bold, Underline, and Italic by Using Shortcut Keys

1. Type **All three** in cell D4.
2. Click the check mark located on the Formula bar.
3. Hold down the Ctrl key while pressing "b" (Ctrl-b).
4. Hold down the Ctrl key while pressing "i" (Ctrl-i).
5. Hold down the Ctrl key while pressing "u" (Ctrl-u).

2.4.Changing the Font, Font Size, and Font Color

You can change the Font, Font Size, and Font Color of the data you enter.

2.4.1.Changing the Font

1. Type **Times New Roman** in cell A5.
2. Click the check mark located on the Formula bar.
3. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
4. Choose the Font tab. All of the Fonts listed in the Font box are available to you.
5. Find and click Times New Roman in the Font box.
6. Click OK. The font changes from Arial to Times New Roman.

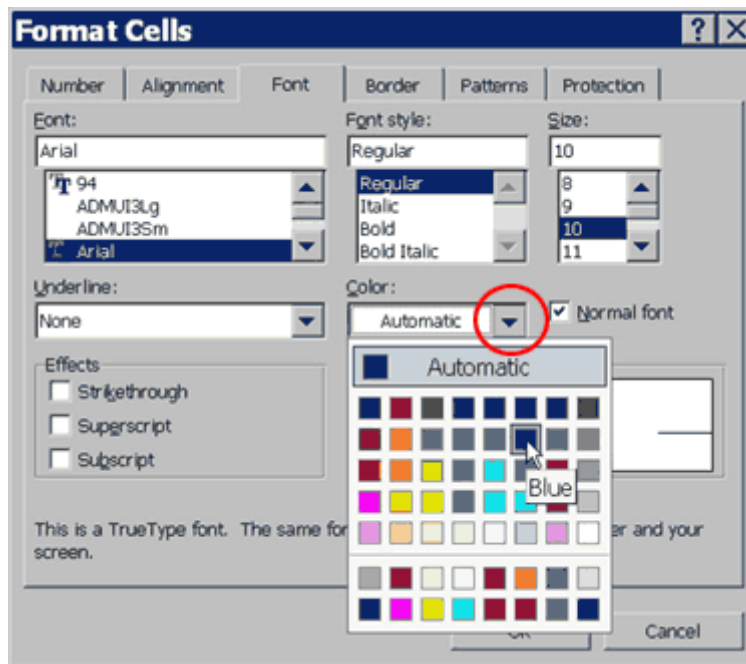
2.4.2.Changing the Font Size

1. Place the cursor in cell A5.
2. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Font tab.
4. Click 16 in the Size box.

- Click OK. The font size changes to 16.

2.4.3.Changing the Font Color

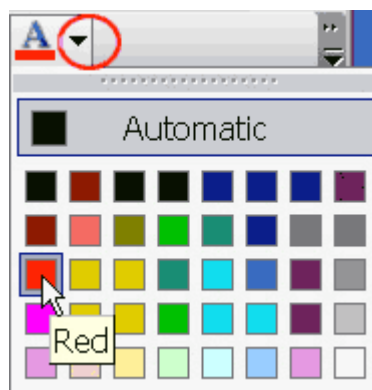
- Place the cursor in cell A5.
- Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
- Choose the Font tab.



- Click to open the drop-down menu associated with the color field.
- Click Blue.
- Click OK. The font color changes to blue.

2.4.4.Alternate Method: Changing the Font Color by Using the Icon

- Place the cursor in cell A5.
- Click the down arrow next to the Font Color icon.



- Click on Red. Your font color changes to red.

2.5. Working with Long Text

Whenever you type text that is too long to fit into a cell, Microsoft Excel attempts to display all the text. It left-aligns the text regardless of the alignment that has been assigned to it, and it borrows space from the blank cells to the right. However, a long text entry will never write over cells that already contain entries -- instead, the cells that contain entries cut off the long text. Do the following exercise to see how this works.

1. Move the cursor to cell A6.
2. Type **Now is the time for all good men to go to the aid of their army.**
3. Press Enter. Everything that does not fit into cell A6 spills over into the adjacent cell.
4. Move the cursor to cell B6.
5. Type **TEST.**
6. Press Enter. The entry in cell A6 is cut off.
7. Move the cursor to cell A6.
8. Look at the Formula bar. The text is still in the cell.

2.6. Changing a Single Column Width

Earlier you increased the column width of every column on the worksheet. You can also increase individual column widths. If you increase the column width, you will be able to see the long text.

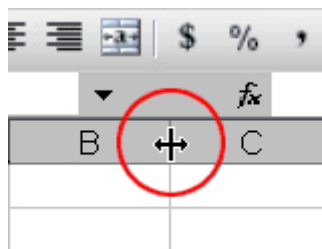
1. Make sure the cursor is anywhere under column A.
2. Choose *Format > Column > Width* from the menu. The column width dialog box opens.
3. Type **55** in the Column Width field.
4. Click OK.

Column A is set to a width of 55. You should now be able to see all of the text.

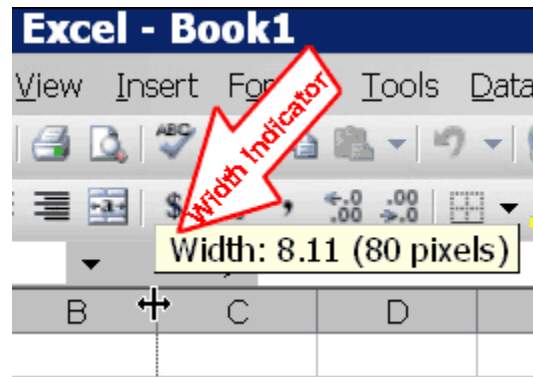
2.6.1. Alternate Method: Changing a Single Column Width by Dragging

You can also change the column width with the cursor.

1. Place the cursor on the line between the B and C column headings. The cursor should look like the one displayed here, with two arrows.



2. Move your mouse to the right while holding down the left mouse button. The width indicator appears on the screen.



3. Release the left mouse button when the width indicator shows approximately 40.

2.6.2. Moving to a New Worksheet

In Microsoft Excel, each workbook is made up of several worksheets. Before moving to the next topic, move to a new worksheet.

1. Click Sheet2 in the lower left corner of the screen.



2.6.3. Setting the Enter Key Direction

In Microsoft Excel, you can specify which direction the cursor moves when you press the Enter key. You can have the cursor move up, down, left, right, or not at all. You will now make sure the cursor is set to move down when you press the Enter key.

1. Choose *Tools > Options* from the menu. The Options dialog box opens.
2. Choose the Edit tab.
3. Make sure there is a check mark in the "Move Selection after Enter" box.
4. If Down is not selected, click to open the Direction drop-down box. Click Down.
5. Click OK.

2.6.4. Making Numeric Entries

In Microsoft Excel, you can enter numbers and mathematical formulas into cells. When a number is entered into a cell, you can perform mathematical calculations such as addition, subtraction, multiplication, and division. When entering a mathematical formula, precede the formula with an equal sign. Use the following to indicate the type of calculation you wish to perform:

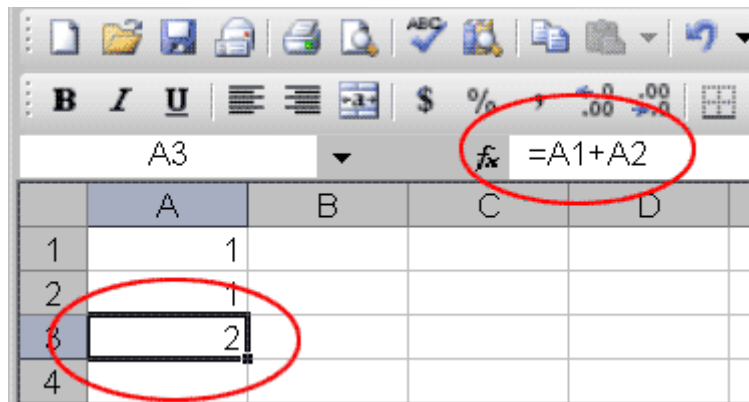
- + Addition
- Subtraction
- * Multiplication
- / Division
- ^ Exponential

2.7.Performing Mathematical Calculations

The following exercises demonstrate how to perform mathematical calculations.

2.7.1.Addition

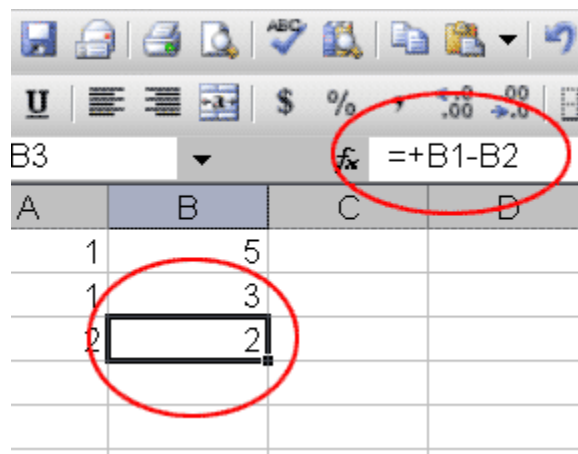
1. Move your cursor to cell A1.
2. Type **1**.
3. Press Enter.
4. Type **1** in cell A2.
5. Press Enter.
6. Type **=A1+A2** in cell A3.
7. Press Enter. Cell A1 has been added to cell A2, and the result is shown in cell A3.



Place the cursor in cell A3 and look at the Formula bar.

2.7.2.Subtraction

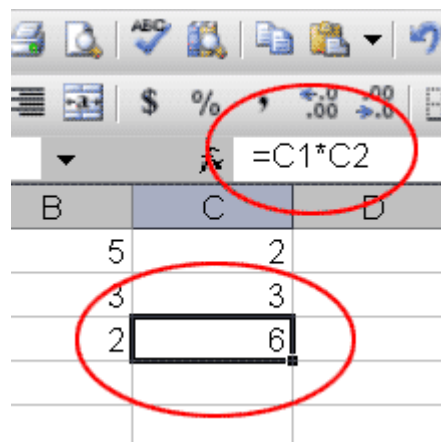
1. Press F5. The Go To dialog box opens.
2. Type **B1** in the Reference field.
3. Press Enter. The cursor should move to cell B1.
4. Type **5** in cell B1.
5. Press Enter.
6. Type **3** in cell B2.
7. Press Enter.
8. Type **=B1- B2** in cell B3.
9. Press Enter. Cell B1 has been subtracted from B2, and the result is shown in cell B3.



Place the cursor in cell B3 and look at the Formula bar.

2.7.3. Multiplication

1. Hold down the Ctrl key while you press "g" (Ctrl-g). The Go To dialog box opens.
2. Type **C1** in the Reference field.
3. Press Enter. You should now be in cell C1.
4. Type **2** in cell C1.
5. Press Enter.
6. Type **3** in cell C2.
7. Press Enter.
8. Type **=C1*C2** in cell C3.
9. Press Enter. Cell C1 is multiplied by cell C2 and the result is displayed in cell C3.

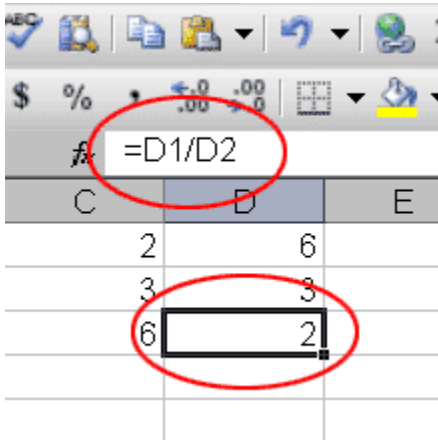


Place the cursor in cell C3 and look at the Formula bar.

2.7.4. Division

1. Press F5.
2. Type **D1** in the Reference field.
3. Press Enter. You should now be in cell D1.
4. Type **6** in cell D1.
5. Press Enter.
6. Type **3** in cell D2.
7. Press Enter.

8. Type **=D1/D2** in cell D3.
9. Press Enter. Cell D1 is divided by cell D2 and the result is displayed in cell D3.

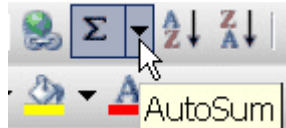


Place the cursor in cell D3 and look at the Formula bar.

2.8. The AutoSum Icon

The AutoSum icon on the Standard toolbar automatically adds a column of numbers. The following illustrates the SUM function:

1. Go to cell F1.
2. Type **3**. Press Enter.
3. Type **3**. Press Enter.
4. Type **3**. Press Enter.
5. Click the AutoSum button, which is located on the Standard toolbar.



6. F1 to F3 should now be highlighted.
7. Press Enter. Cells F1 through F3 are added.

2.9. Automatic Calculation

If you have automatic calculation turned on, Microsoft Excel recalculates the worksheet as you change cell entries. You can check to make sure automatic calculation is turned on.

2.9.1. Setting Automatic Calculation

1. Choose **Tools > Options** from the menu.
2. Choose the Calculation tab.
3. Select Automatic if it is not already selected.
4. Click OK.

2.9.2. Trying Automatic Calculation

Make the changes outlined below and note how Microsoft Excel automatically recalculates.

1. Move to cell A1.
2. Type **2**. Press the Enter key. The results shown in cell A3 have changed. The number in cell A1 has been added to the number in cell A2 and the results display in cell A3.
3. Move to cell B1.
4. Type **6**.
5. Press the Enter key. The results shown in cell B3 have changed. The number in cell B1 has been subtracted from the number in cell B2 and the results display in cell B3.
6. Move to cell C1.
7. Type **4**. Press the Enter key. The results shown in cell C3 have changed. The number in cell C1 has been multiplied by the number in cell C2 and the results display in cell C3.
8. Move to cell D1.
9. Type **12**. Press the Enter key. The results shown in cell D3 have changed. The number in cell D1 has been divided by the number in cell D2 and the results display in cell D3.

2.10. Formatting Numbers

You can format the numbers you enter into Microsoft Excel. You can add commas to separate thousands, specify the number of decimal places, place a dollar sign in front of the number, or display the number as a percent in addition to several other options.

4		
5	1234567	
6		

Before formatting

4		
5	1,234,567.00	
6		

After formatting

1. Move the cursor to cell A5.
2. Type **1234567**.
3. Press Enter.
4. Move the cursor back to cell A5.
5. Choose *Format > Cells* from the menu. The Format Cells dialog box will open.
6. Choose the Number tab.
7. Click Number in the Category box.
8. Type **2** in the Decimal Places box.
9. Place a check mark in the Use 1000 Separator box.
10. Click OK. The number should now display with two decimal places. The thousands should now be separated by commas.

2.10.1. Adding a Dollar Sign to a Numeric Entry

1. Move the cursor to cell A5.
2. Choose *Format > Cells* from the menu. The Format Cells dialog box opens.
3. Choose the Number tab.
4. Click Currency in the Category box.
5. Make sure there is a "\$" in the Symbol box.
6. Click OK. The number displays with a dollar sign.

4		
5	\$1,234,567.00	
6		

2.10.2. Alternate Method: Formatting Numbers by Using the Toolbar



1. Move the cursor to cell A6.
2. Type **1234567**.
3. Press Enter.
4. Move the cursor back to cell A6.
5. Click twice on the Increase Decimal icon to change the number format to two decimal places. Clicking on the Decrease Decimal icon decreases the decimal places.
6. Click once on the Comma Style icon to add commas to the number.
7. To change the number to a currency format, click Currency Style format.
8. Move the cursor to cell A7.
9. Type **.35** (note the decimal point).

6	0.35	
---	------	--

10. Press Enter.
11. Move the cursor back to cell A7.
12. Click the Percent Style icon to turn .35 to a percent.

6	35%	
---	-----	--

2.11. More Advanced Mathematical Calculations

When you perform mathematical calculations in Microsoft Excel, be careful of precedence. Calculations are performed from left to right, with multiplication and division performed before addition and subtraction.

1. Move to a new worksheet by clicking on Sheet3 in the lower left corner of the screen.
2. Go to cell A1.
3. Type **=3+3+12/2*4**.
4. Press Enter.

Note: Microsoft Excel divided 12 by 2, multiplied the answer by 4, added 3, and then added another 3. The answer, 30, displays in cell A1.

To change the order of calculation, use parentheses. Microsoft Excel calculates the information in parentheses first.

1. Double-click in cell A1.
2. Edit the cell to read $=(3+3+12)/2*4$.
3. Press Enter.

Note: Microsoft Excel added 3 plus 3 plus 12, divided the answer by 2, and multiplied the result by 4. The answer, 36, displays in cell A1.

2.12. Cell Addressing

Microsoft Excel records cell addresses in formulas in three different ways, called *absolute*, *relative*, and *mixed*. The way a formula is recorded is important when you copy it.

With relative cell addressing, when you copy a formula from one area of the worksheet to another, Microsoft Excel records the position of the cell relative to the cell that originally contained the formula. The following exercises demonstrate:

1. Go to cell A7.
2. Type 1. Press Enter.
3. Type 1. Press Enter.
4. Type 1. Press Enter.
5. Go to cell B7.
6. Type 2. Press Enter.
7. Type 2. Press Enter.
8. Type 2. Press Enter.
9. Go to cell A10.

In addition to typing a formula, as you did in Lesson 1, you can also enter formulas by using Point mode. When you are in Point mode, you can enter a formula either by clicking on a cell with your mouse or by using the arrow keys.

1. You should be in cell A10.
2. Type =.
3. Use the up arrow key to move to cell A7.
4. Type +.
5. Use the up arrow key to move to cell A8.
6. Type +.
7. Use the up arrow key to move to cell A9.
8. Press Enter.
9. Look at the Formula bar while in cell A10. Note that the formula you entered is recorded in cell A10.

2.12.1. Copying by Using the Menu



You can copy entries from one cell to another cell. To copy the formula you just entered, follow these steps:

1. You should be in cell A10.
2. Choose *Edit > Copy* from the menu. Moving dotted lines appear around cell A10, indicating the cells to be copied.
3. Press the Right Arrow key once to move to cell B10.
4. Choose *Edit > Paste* from the menu. The formula in cell A10 is copied to cell B10.
5. Press Esc to exit the Copy mode.

Compare the formula in cell A10 with the formula in cell B10 (while in the respective cell, look at the Formula bar). The formulas are the same except that the formula in cell A10 sums the entries in column A and the formula in cell B10 sums the entries in column B. The formula was copied in a *relative* fashion.

Before proceeding with the next exercise, you must copy the information in cells A7 to B9 to cells C7 to D9. This time you will copy by using the Formatting toolbar.

2.12.2. Copying by Using the Formatting Toolbar

1. Highlight cells A7 to B9. Place the cursor in cell A7. Press F8. Press the down arrow key twice. Press the right arrow key once. A7 to B9 should be highlighted.
2. Click the Copy icon  , which is located on the Formatting toolbar.
3. Use the arrow key to move the cursor to cell C7.
4. Click the Paste icon  , which is located on the Formatting toolbar.
5. Press Esc to exit Copy mode.

2.12.3. Absolute Cell Addressing

An *absolute* cell address refers to the same cell, no matter where you copy the formula. You make a cell address an absolute cell address by placing a dollar sign in front of both the row and column identifiers. You can do this automatically by using the F4 key. To illustrate:

1. Move the cursor to cell C10.
2. Type =.
3. Use the up arrow key to move to cell C7.
4. Press F4. Dollar signs should appear before the C and before the 7.
5. Type +.
6. Use the up arrow key to move to cell C8.
7. Press F4.
8. Type +.
9. Use the up arrow key to move to cell C9.
10. Press F4.
11. Press Enter. The formula is recorded in cell C10.

2.12.4. Copying by Using the Keyboard Shortcut

Now copy the formula from C10 to D10. This time, you will copy by using the keyboard shortcut.

1. Your cursor should be in cell C10.
2. Hold down the Ctrl key while you press "c" (Ctrl-c). This copies the contents of cell C10.
3. Press the right arrow once.

4. Hold down the Ctrl key while you press "v" (Ctrl-v). This pastes the contents of cell C10 in cell D10.
5. Press Esc to exit the Copy mode.

Compare the formula in cell C10 with the formula in cell D10. They are the same. The formula was copied in an *absolute* fashion. Both formulas sum column C.

2.12.5. Mixed Cell Addressing

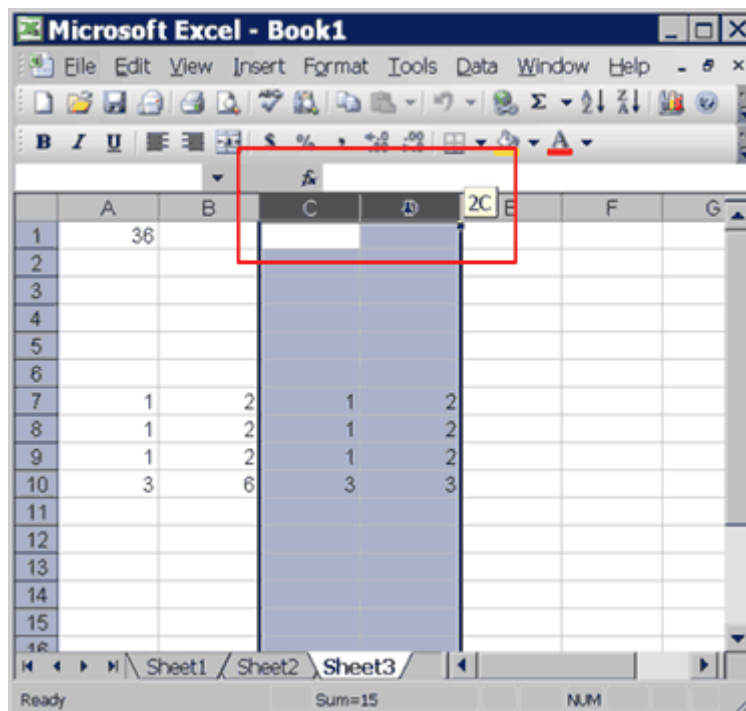
You use mixed cell addressing to reference a cell that is part absolute and part relative. You can use the F4 key.

1. Move the cursor to cell E1.
2. Type =.
3. Press the up arrow key once.
4. Press F4.
5. Press F4 again. Note that the column is relative and the row is absolute.
6. Press F4 again. Note that the column is absolute and the row is relative.
7. Press Esc.

2.13. Deleting Columns

You can delete columns from your spreadsheet. To delete columns C and D:

1. Click on column C and drag to column D.

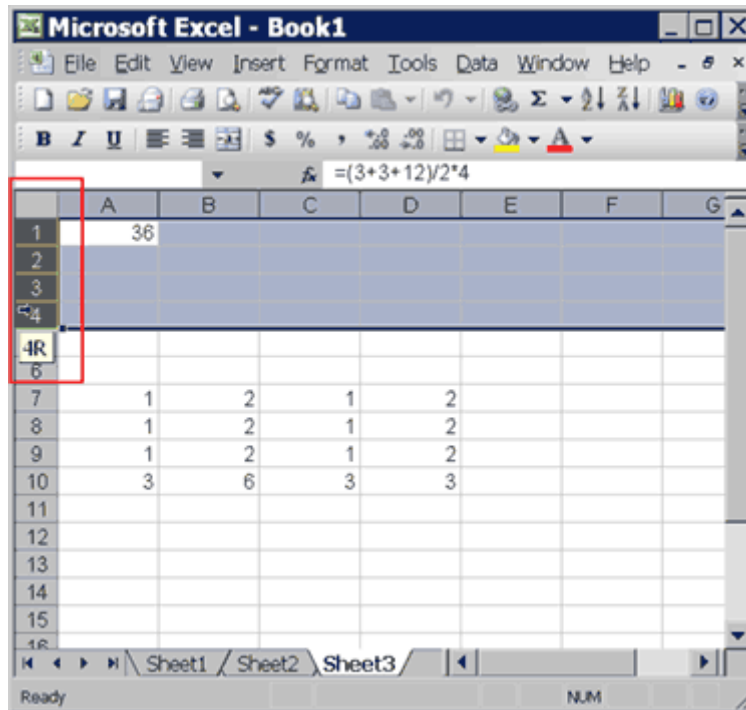


2. Choose *Edit > Delete* from the menu. Column D is deleted.
3. Click anywhere on the spreadsheet to remove your selection.

2.14. Deleting Rows

You can delete rows from your spreadsheet. To delete rows 1 through 4:

1. Click the row 1 and drag to row 4.



1. Choose *Edit > Delete* from the menu. Rows 1 through 4 are deleted.
2. Click anywhere on the spreadsheet to remove your selection.

2.15. Inserting Columns

There will be times when you will need to insert a column or columns into your spreadsheet. To insert a column:

1. Click on A to select column A.
2. Choose *Insert > Columns* from the menu. A column is inserted to the right of column A.
3. Click anywhere on the spreadsheet to remove your selection.

2.16. Inserting Rows

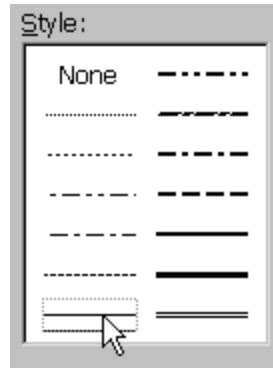
You can also insert rows into your spreadsheet:

1. Click on 2 to select row 2.
2. Choose *Insert > Rows* from the menu. A row is inserted above row 2.
3. Click anywhere on the spreadsheet to remove your selection.

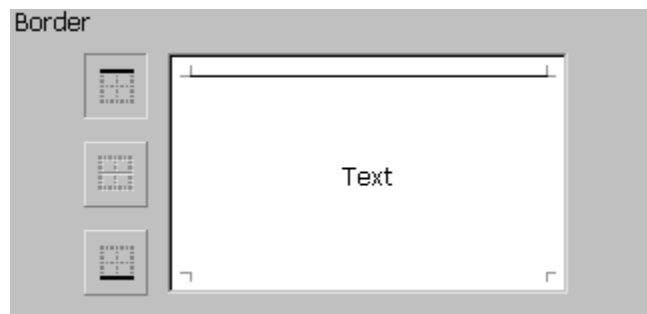
2.17. Creating Borders

You can use borders to make entries on your spreadsheet stand out. Accountants usually place a single underline above a final number and a double underline below. The following illustrates:

1. Go to cell B7.
2. Choose *Format > Cells* from the menu.
3. Choose the Border tab.



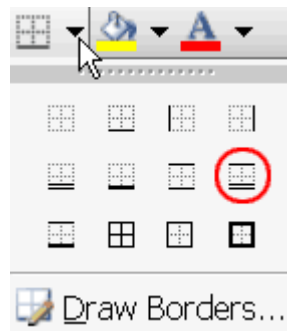
4. In the Style box, click on the single underline.



5. Click the top of the Border box.
6. In the Style box, click on the double underline.
7. Click the bottom of the Border box.
8. Click OK. Cell B7 now has a border.

2.17.1. Alternate Method: Creating Borders by Using the Icon


1. Go to cell C7. Click the down arrow beside the Borders icon.



2. Select the Top and Double Bottom Border. Cell C7 now has borders.

2.18. Merge and Center

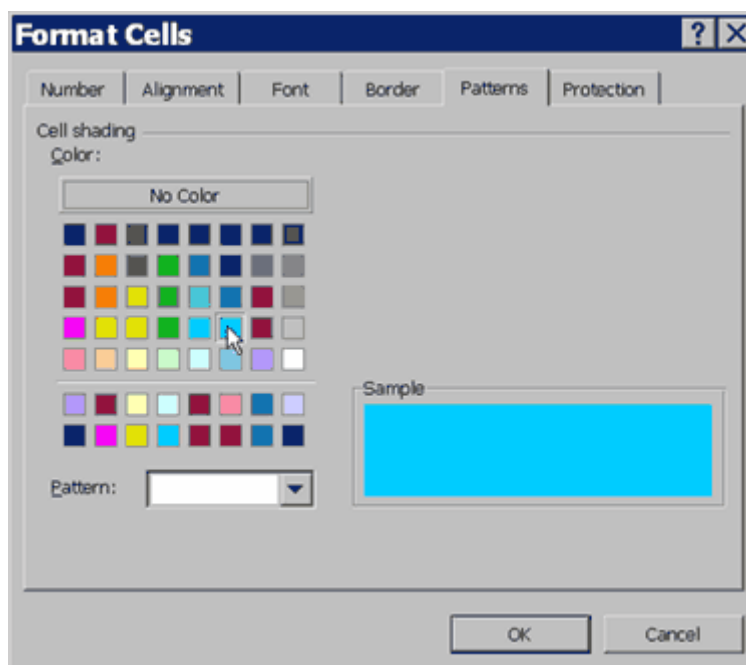
You will sometimes want to center a piece of text over several columns. The following example shows you how.

1. Go to cell B1.
2. Type **Sample Spreadsheet**.
3. Click the check mark on the Formula bar.
4. Select columns B1 to D1.
5. Click the Merge and Center icon  on the formatting toolbar. Cells B1, C1, and D1 are merged and centered.

2.19. Adding Background Color


You can add background color to a cell or group of cells:

1. Go to cell B1.
2. Choose *Format > Cells* from the menu.
3. Choose the Patterns tab.



4. Choose Sky Blue.
5. Click OK. The background of cell B1 is now Sky Blue.

2.19.1. Alternate Method: Adding Background Color by Using the Icon

1. Select cells B7 to D7.
2. Click the down-arrow next to the Fill Color icon .



3. Select Pale Blue. The background of cells B7 to D7 is now Pale Blue.

2.20. *Using Auto Format*

You can format your data manually or you can use one of Microsoft Excel's many AutoFormats.

1. Select cells B1 to D7.
2. Choose *Format > Auto Format* from the menu. Several formats are listed from which you can choose.
3. Choose the Accounting 2 format.
4. Click OK. Your data is formatted in the Accounting 2 style.

2.21. *Saving Your File*

To save your file:

1. Choose *File>Save* from the menu.
2. Go to the directory in which you want to save your file.
3. Type **lesson2** in the File Name field.
4. Click Save.

2.22. *Closing Microsoft Excel*

This is the end of Lesson 2. Close Microsoft Excel.

1. Choose *File > Exit* from the menu.

3. Lesson 3: Numbers and Mathematical Calculations

Microsoft Excel has many functions that you can use. Functions allow you to quickly and easily find an average, the highest number, the lowest number, a count of the number of items in a list, and make many other useful calculations.

3.1.Reference Operators

Reference operators refer to a cell or a group of cells. There are two types of reference operators, *range* and *union*.

A range reference refers to all the cells between and including the reference. A range reference consists of two cell addresses separated by a colon. The reference A1:A3 includes cells A1, A2, and A3. The reference A1:C3 includes A1, A2, A3, B1, B2, B3, C1, C2, and C3.

A union reference includes two or more references. A union reference consists of two or more cell addresses separated by a comma. The reference A7,B8,C9 refers to cells A7, B8, and C9.

3.2.Functions

Microsoft Excel has a set of prewritten formulas called *functions*. Functions differ from regular formulas in that you supply the value but not the operators, such as +, -, *, or /. For example, you can use the SUM function to add. When using a function, remember the following:

Use an equal sign to begin a formula.

Specify the function name.

Enclose arguments within parentheses.

Use a comma to separate arguments.

Here is an example of a function:

=SUM(2,13,A1,B27)

In this function:

The equal sign begins the function.

SUM is the name of the function.

2, 13, A1, and B27 are the arguments.

Parentheses enclose the arguments.

A comma separates the arguments.

The SUM function adds the arguments together. In the exercises that follow, we will look at various functions.

3.3.Typing a Function

1. Open Microsoft Excel.
2. Type **12** in cell B1.
3. Press Enter.

4. Type **27** in cell B2.
5. Press Enter.
6. Type **24** in cell B3.
7. Press Enter.
8. Type **=SUM(B1:B3)** in cell A4.
9. Press Enter. Microsoft Excel sums cells B1 to B3.

3.3.1. Alternate Method: Entering a Function by Using the Menu

1. Type **150** in cell C1.
2. Press Enter.
3. Type **85** in cell C2.
4. Press Enter.
5. Type **65** in cell C3.
6. Press Enter. Your cursor should be in cell C4.
7. Choose *Insert > Function* from the menu.
8. Choose Math & Trig in the Or Select A Category box.
9. Click Sum in the Select A Function box.
10. Click OK. The Functions Arguments dialog box opens.
11. Type **C1:C3** in the Number1 field, if it does not automatically appear.
12. Click OK. Microsoft Excel sums cells C1 to C3.
13. Move to cell A4.
14. Type the word **Sum**.
15. Press Enter.

As you learned in Lesson 2, you can also calculate a sum by using the Sum icon.

3.4. Calculating an Average

You can use the AVERAGE function to calculate the average of a series of numbers.

1. Move your cursor to cell A6.
2. Type **Average**. Press the right arrow key to move to cell B6.
3. Type **=AVERAGE(B1:B3)**.
4. Press Enter. The average of cells B1 to B3, which is 21, will appear.

3.5. Calculating an Average by Using the Sum Icon

In Microsoft Excel XP, you can use the Sum icon to calculate an average.

1. Move your cursor to cell C6.
2. Click the drop-down arrow next to the Sum icon.
3. Click Average.
4. Highlight C1 to C3.
5. Press Enter. The average of cells C1 to C3, which is 100, appears.

3.6. Calculating Min

You can use the MIN function to find the lowest number in a series of numbers.

1. Move your cursor to cell A7.
2. Type **Min**.
3. Press the right arrow key to move to cell B7.
4. Type = **MIN(B1:B3)**.
5. Press Enter. The lowest number in the series, which is 12 appears.

3.7. Calculating Max

You can use the MAX function to find the highest number in a series of numbers.

1. Move your cursor to cell A8.
2. Type **Max**.
3. Press the right arrow key to move to cell B8.
4. Type = **MAX(B1:B3)**.
5. Press Enter. The highest number in the series, which is 27, appears.

Note: You can also use the drop-down menu next to the Sum icon to calculate minimums and maximums.

3.8. Calculating Count

You can use the count function to count the number of items in a series.

1. Move your cursor to cell A9.
2. Type **Count**
3. Press the right arrow key to move to cell B9.
4. Click the down arrow next to the Sum icon.
5. Click Count.
6. Highlight B1 to B3.
7. Press Enter. The number of items in the series, which is 3 appears.

3.9. Filling Cells Automatically

You can use Microsoft Excel to fill cells automatically with a series. For example, you can have Excel automatically fill in times, the days of the week or months of the year, years, and other types of series. Days of the week and months of the year fill in a similar fashion. The following demonstrates filling the days of the week:

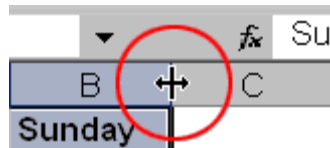
1. Move to Sheet2.
2. Move to cell A1.
3. Type **Sun**.
4. Move to cell B1.
5. Type **Sunday**.
6. Highlight cells A1 to B1.
7. Bold cells A1 to B1.
8. Find the small black square in the lower right corner of the highlighted area. This is called the Fill Handle.
9. Grab the Fill Handle and drag with your mouse to fill cell A1 to B24. Note how the days of the week fill the cells in a series. Also, note that the Auto Fill Options icon appears.

	A	B	C
1	Sun	Sunday	
2			
3			

10. Click the Auto Fill Options icon.
11. Choose the Copy Cells radio button. The entry in cells A1 and B1 are copied to all the cells highlighted.
12. Click the Auto Fill Options icon again.
13. Choose the Fill Series radio button. The cells fill as a series from Sunday to Saturday again.
14. Click the Auto Fill Options icon again.
15. Choose the Fill Without Formatting radio button. The cells fill as a series from Sunday to Saturday, but the entries are not bolded.
16. Click the Auto Fill Options icon again.
17. Choose the Fill Weekdays radio button. The cells fill as a series from Monday to Friday.

Some of the entries in column B are too long to fit in the column. You can quickly adjust the column width to fit the longest entry.

1. Move your cursor over the line that separates column B and C. The Width Indicator appears.



2. Double-click. The Column adjusts to fit the longest entry.

The following demonstrates filling time:

1. Type **1:00** into cell C1.
2. Grab the Fill Handle and drag with your mouse to highlight cells A1 to A24. Note that each cell fills using military time.
3. Press Esc and then click anywhere on the worksheet to remove the highlighting.

To change the format of the time:

1. Select cells C1 to C24.
2. Choose *Format > Cells* from the menu.
3. Choose the Number tab.
4. In the Category box, choose Time.
5. In the Type box, choose 1:30 PM.
6. Click OK. The time is no longer in military time.

You can also fill numbers.

Type a **1** in cell D1.

1. Grab the Fill Handle and drag with your mouse to highlight cells D1 to D24. The number 1 fills each cell.
2. Click the Auto Fill Options icon.

3. Choose the Fill Series radio button. The cells fill as a series starting with 1, 2, 3.

Here is another interesting fill feature.

1. Go to cell E1.
2. Type **Lesson 1**.
3. Grab the Fill Handle and drag with your mouse to highlight cells E1 to E24.
4. The cells fill in as a series: Lesson 1, Lesson 2, Lesson 3, and so on.

3.10. Printing

The simplest way to print is to click the Print icon located on the Standard toolbar. Dotted lines will appear on your screen after you click the print icon. The dotted lines indicate the right, left, top, and bottom edges of your printed pages.

3.11. Print Preview

There are many print options. You can select print options options in Page Setup or in Print Preview. In Print Preview, you can see the results of your selections onscreen. You can use print options to:

- Determine whether to print landscape or portrait. If you print portrait on an 8 1/2 by 11 sheet of paper, the length across the top of your page will be 8 1/2 inches. If you print landscape on an 8 1/2 by 11 sheet of paper, the length across the top of your page will be 11 inches.
- Scale your document. If your data is small in comparison to the page, you may want to scale upward so the data fills the entire page. If your data is too large to fit on the page, you may want to scale downward.
- Specify how many pages wide and how many pages long you want your printed document to be.
- Select the paper size and print quality.
- Set the first page number.

If you choose the Margins tab, you can:

- Set the size of your margins including your header and footer margins.
- Center your spreadsheet horizontally and/or vertically on the page.

If you choose the Header/Footer tab, you can select headers and footers. A header is text that appears at the top of every page. A footer is text that appears at the bottom of every page. You can use headers and footers to insert page numbers, dates, and other information.

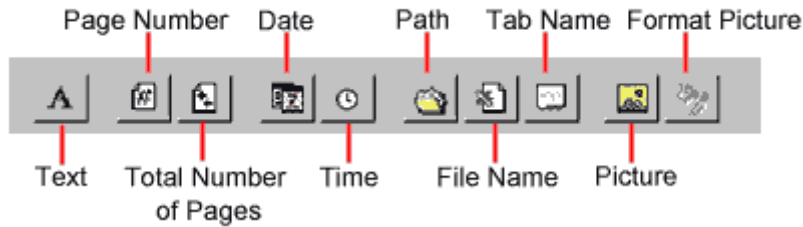
To choose a header:

1. Choose the Header/Footer tab.
2. Click the down arrow next to the Header field to open the drop-down box for the header field.
3. Choose a Header from the list.

To choose a footer:

1. Choose the Header/Footer tab.
2. Click the down arrow next to the Footer field to open the drop-down box for the Footer field.
3. Choose a Footer from the list.

Click the Custom Header or Custom Footer button to customize your headers and footers.



Use the Left Section to place your options on the left side of the page, the Center Section to place your options in the center of the page, and the Right Section to place your options on the right side of the page.

The Sheet tab has options that allow you to choose which rows and columns will repeat at the left and the top of the page. It also has options that allows you to determine whether gridlines and/or row column headings print

To preview and print your spreadsheet:

1. Choose *File > Preview* from the menu.
2. Click Setup.
3. Choose the Page tab.
4. Choose Portrait.
5. In the Adjust To field, type **110%** to set the size to 110%,.
6. Choose the Margin tab.
7. Check the Horizontally box in the Center On Page frame to center your spreadsheet horizontally.
8. Click OK.
9. Click Print. The Print dialog box opens.
10. Click OK to print the file.

3.12. Saving Your File

To save your file:

1. Choose *File>Save* from the menu.
2. Go to the directory in which you want to save your file.
3. Type **lesson3** in the File Name field.
4. Click Save.

3.13. Closing Microsoft Excel

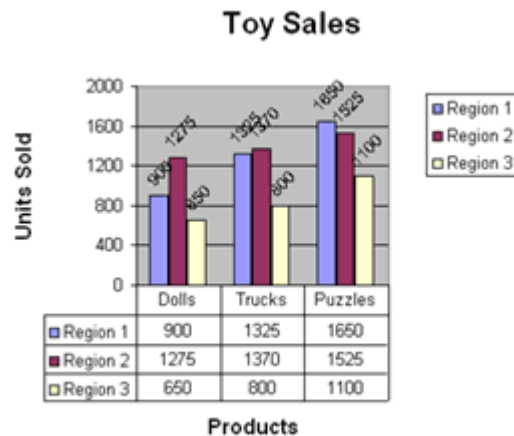
This is the end of Lesson 3. Close Microsoft Excel.

1. Choose *File > Exit* from the menu.

4. Lesson 4: Creating Charts

Using Microsoft Excel, you can represent numbers in a chart. You can choose from a variety of chart types. And, as you change your data, your chart will automatically update. You can use Microsoft Excel's Chart Wizard to take you through the process step-by-step.

4.1. Creating a Column Chart

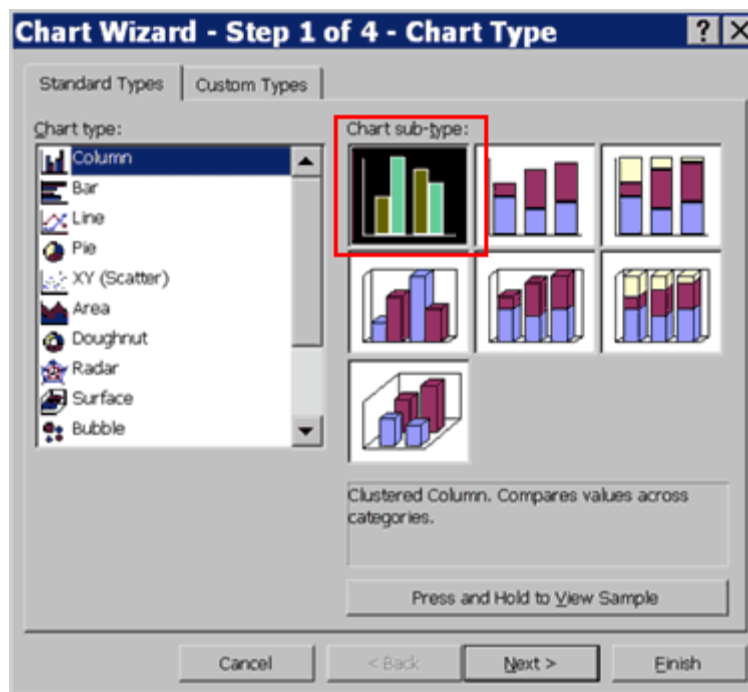


To create the column chart shown above, start by creating the spreadsheet below exactly as shown.

	A	B	C	D	E
1	Toy Sales				
2					
3	Products	Region 1	Region 2	Region 3	
4	Dolls	900	1275	650	
5	Trucks	1325	1370	800	
6	Puzzles	1650	1525	1100	
7					

After you have created the spreadsheet, you are ready to create your chart.

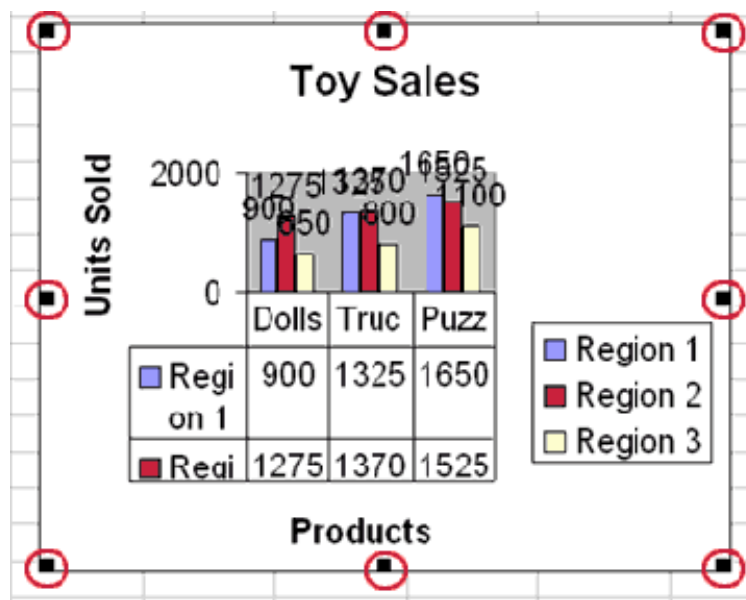
1. Highlight cells A3 to D6. You must highlight all the cells containing the data you want in your chart. You should also include the data labels.
2. Choose *Insert > Chart* from the menu.
3. Click Column to select the type of chart you want to create.
4. In the Chart Sub-type box, choose the Clustered Column icon to select the chart sub-type.



5. Click Next.
6. To place the product names on the x-axis, select the Columns radio button.
7. Click Next.
8. Type Toy Sales in the Chart Title field. Toy Sales will appear as the title of your chart.
9. Type Products in the Category (X) Axis field. Products will appear as your x-axis title.
10. Type Units Sold in the Value (Y) Axis field. Units Sold will appear as your y-axis title.
11. Choose the Data Labels tab.
12. Select Value in the Labels Contain Frame to display the data labels as values.
13. Choose the Data Table tab.
14. Select Show Data Table. The data table will appear below your chart.
15. Click Next.
16. Choose As Object In Sheet1 to make your chart an embedded object and part of the worksheet.
17. Click Finish
18. Your chart will appear on the spreadsheet.

4.2.Changing the Size and Position of a Chart

When you select a chart, handles appear on the right and left sides, the top and bottom, and the corners of the chart. You can drag the handles on the top and bottom of the chart to increase or decrease the height of the chart. You can drag the handles on the left and right sides of the chart to increase or decrease the width of the chart. You can drag the handles on the corners of the chart to increase or decrease the size of the chart proportionally.



You can change the position of a chart by clicking on the chart and dragging

1. Use the handles to adjust the size of your chart.
2. Click the chart and drag to position the chart under the data.

4.3. Modify Your Chart

You can modify your chart by using the Chart toolbar. If the Chart toolbar is not already available, choose View > Toolbars > Chart from the menu.

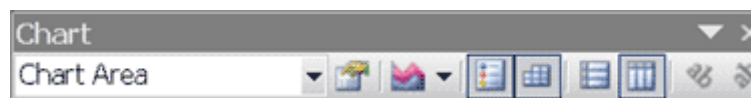
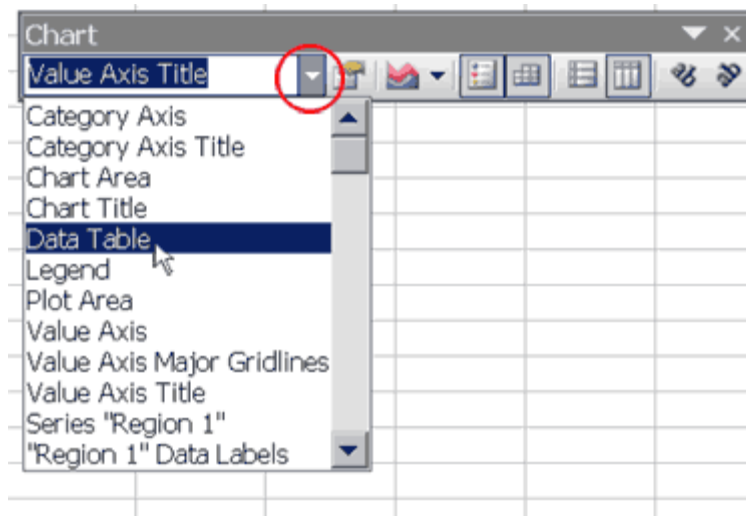



Chart Toolbar


To change the data area font size:

1. Click the down arrow on the Chart toolbar. A drop-down menu opens.
2. Choose Data Table from the drop-down menu.



3. Click the Options icon . Choose the Font tab.
4. In the Size box, type 8.
5. Click OK. Your font size is now 8.

To change the angle of the data labels:

1. Click the down arrow on the Chart toolbar. A drop-down menu opens.
2. Choose "Region 1" Data Labels from the drop-down menu.
3. Click the Angle Counter Clockwise icon . The Region 1 Data Labels are angled counter-clockwise.
4. Repeat this process for Regions 2 and 3.

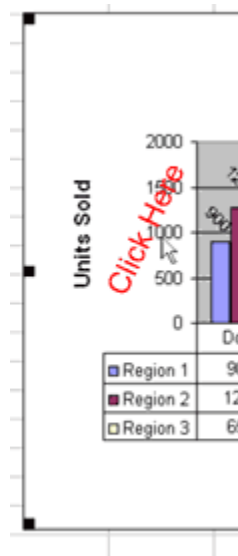
To change the font size of the Region data labels:

1. Click the down arrow on the Chart toolbar. A drop-down menu opens.
2. Choose "Region 1" Data Labels from the drop-down menu.
3. Click the Options icon. Choose the Font tab.
4. In the Size box, type 6.
5. Click OK. Your font size is now 6.
6. Repeat this process for Region 2 and 3.

You can also make changes by double-clicking on the item you want to change.

To change the chart scale:

1. Double-click on the scale. The Format Axis dialog box opens.



2. Choose the Scale tab.
3. Type 400 in the Major Unit field.
4. Click OK. Your chart is now scaled in units of 400.

4.4. Saving Your File

To save your file:

1. Choose *File>Save* from the menu.
2. Go to the directory in which you want to save your file.
3. Type **lesson4** in the File Name field.
4. Click Save.

4.5. Closing Microsoft Excel

This is the end of Lesson 4. Close Microsoft Excel.

1. Choose *File > Exit* from the menu.

II. Microsoft Access

1. Brief overview of Relational Databases and Database Applications

The first databases implemented during the 1960s and 1970s were based upon either flat data files or the hierarchical or networked data models. These methods of storing data were relatively inflexible due to their rigid structure and heavy reliance on applications programs to perform even the most routine processing.

In the late 1970s, the *relational database model* which originated in the academic research community became available in commercial implementations such as IBM DB2 and Oracle. The relational data model specifies data stored in *relations* that have some *relationships* among them (hence the name *relational*).

In relational databases such as Sybase, Oracle, IBM DB2, MS SQL Server and MS Access, data is stored in *tables* made up of one or more *columns* (Access calls a column a *field*). The data stored in each column must be of a single *data type* such as Character, Number or Date. A collection of values from each column of a table is called a *record* or a *row* in the table.

Different tables can have the same column in common. This feature is used to explicitly specify a relationship between two tables. Values appearing in column A in one table are shared with another table.

Below are two examples of tables in a relational database for a local bank:

2. Customer Table

CustomerID	Name	Address	City	State	Zip
<i>Number</i>	<i>Character</i>	<i>Character</i>	<i>Character</i>	<i>Character</i>	<i>Character</i>
1001	Mr. Smith	123 Lexington	Smithville	KY	91232
1002	Mrs. Jones	12 Davis Ave.	Smithville	KY	91232
1003	Mr. Axe	443 Grinder Ln.	Broadville	GA	81992
1004	Mr. & Mrs. Builder	661 Parker Rd.	Streetville	GA	81990

3. Accounts Table

CustomerID	AccountNumber	AccountType	DateOpened	Balance
<i>Number</i>	<i>Number</i>	<i>Character</i>	<i>Date</i>	<i>Number</i>
1001	9987	Checking	10/12/1989	4000.00
1001	9980	Savings	10/12/1989	2000.00
1002	8811	Savings	01/05/1992	1000.00
1003	4422	Checking	12/01/1994	6000.00
1003	4433	Savings	12/01/1994	9000.00
1004	3322	Savings	08/22/1994	500.00
1004	1122	Checking	11/13/1988	800.00

The Customer table has 6 columns (CustomerID, Name, Address, City, State and Zip) and 4 rows (or records) of data. The Accounts table has 5 columns (CustomerID, AccountNumber, AccountType, DateOpened and Balance) with 7 rows of data.

Each of the columns conforms to one of three basic *data types*: Character, Number or Date. The data type for a column indicates the type of data values that may be stored in that column.

- Number - may only store numbers, possibly with a decimal point.
- Character - may store numbers, letters and punctuation. Access calls this data type **Text**.
- Date - may only store date and time data.

In some database implementations other data types exist such as Images (for pictures or other data). However, the above three data types are most commonly used.

Notice that the two tables share the column CustomerID and that the values of the CustomerID column in the Customer table are the same the values in the CustomerID column in the Accounts table. This *relationship* allows us to specify that the Customer **Mr. Axe** has both a Checking and a Savings account that were both opened on the same day: December 1, 1994.

Another name given to such a relationship is *Master/Detail*. In a master/detail relationship, a single master record (such as Customer 1003, Mr. Axe) can have many details records (the two accounts) associated with it.

In a Master/Detail relationship, it is possible for a Master record to exist without any Details. However, it is impossible to have a Detail record without a matching Master record. For example, a Customer may not necessarily have any account information at all. However, any account information *must* be associated with a single Customer.

Each table also must have a special column called the **Key** that is used to uniquely identify rows or records in the table. Values in a key column (or columns) may never be duplicated. In the above tables, the CustomerID is the key for the Customer table while the AccountNumber is the key for the Accounts table.

3.1.A Business Example

In this section, we will outline a business example that will be used as a basis for the examples throughout the tutorial. In organizations, the job of analyzing the business and determining the appropriate database structure (tables and columns) is typically carried out by *Systems Analysts*. A Systems Analyst will gather information about how the business operates and will form a *model* of the data storage requirements. From this model, a database programmer will create the database tables and then work with the application developers to develop the rest of the database application.

For this tutorial, we will consider a simple banking business. The bank has many customers who open and maintain one or more accounts. For each Customer, we keep a record of their name and address. We also assign them a unique CustomerID. We assign this unique identifier both for convenience and for accuracy. It is much easier to identify a single customer using their CustomerID rather than by looking up their full name and address. In addition, it is possible for the bank to have two customers with the same name (e.g., Bill Smith). In such cases, the unique CustomerID can always be used to tell them apart.

In a similar fashion, all accounts are assigned a unique account number. An account can be either a checking account or a savings account. Savings accounts earn interest but the only transactions allowed are deposits and withdrawals. Checking accounts do not earn interest. We maintain the date that the account was opened. This

helps us track our customers and can be useful for marketing purposes. Finally, we maintain the current balance of an account.

In the previous section, we gave the structure and some sample data for the Customer table and the Accounts table. These will be used to support the data storage part of our Banking application.

In any database application, each of the tables requires a means to get data into them and retrieve the data at a later time. The primary way to get data into tables is to use data entry forms. The primary ways to get data back out of tables or to display data in tables are to use queries or reports.

For this tutorial, we will create a data entry form for each table, a query for each table and a report for each table.

In the following sections, we will first introduce how to start Access and how to create a new database.

4. Starting Microsoft Access

To start Access, click on the Start button, then the Programs menu, then move to the MS Office menu and finally click on the Microsoft Access menu item. The MS Office Professional menu is shown below.



Note that this arrangement of menus may vary depending on how MS Office was installed on the PC you are using.

Once Access is running, an initial screen will be displayed:



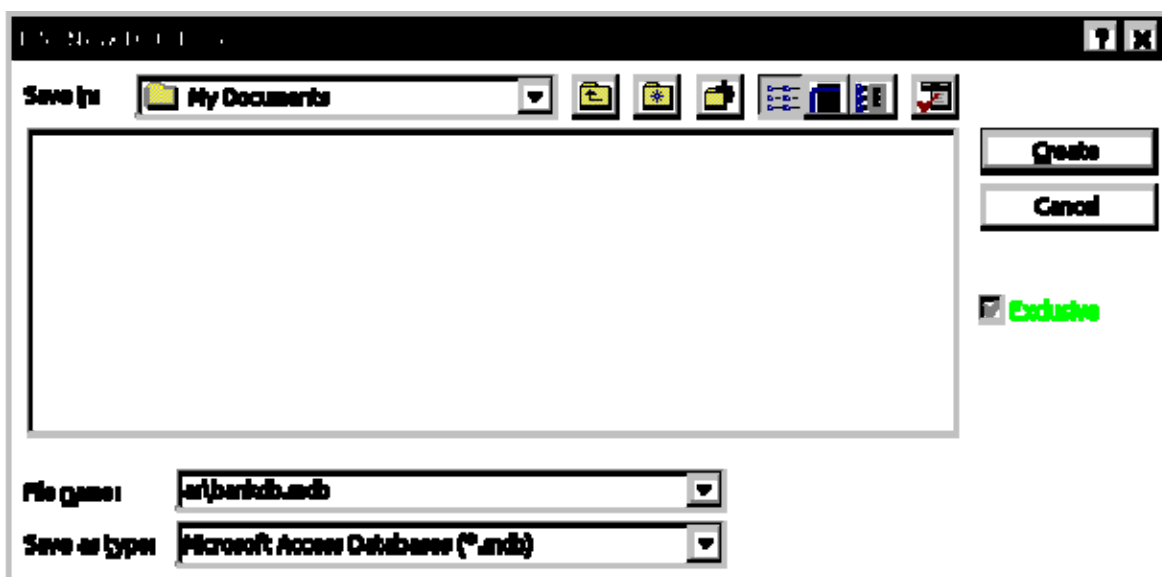
From this initial screen, the user can create a new database (either blank or with some tables created with the database wizard), or open up an existing database.

In general, the first time one begins a project, a new, blank database should be created. After that point, use the *Open existing database* option to re-open the database created previously.

Warning - If you have previously created a database, and then create it again using the same name, you will overwrite any work you have done.

For the purposes of this tutorial, if you are going through these steps for the first time, choose the option to create a new, blank database as shown in the above figure.

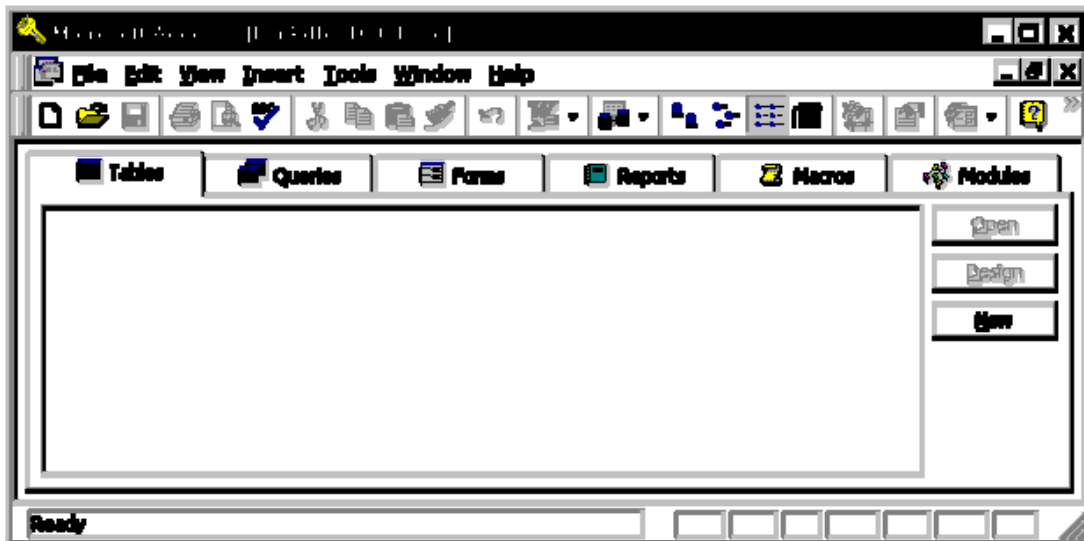
By selecting **Blank Database** and clicking on the OK button, the following screen will appear in order to give the new database a file name. Fill in *File Name* as a:\bankdb.mdb and click on the Create button to create the database as in the following figure:



In the above file name, the a:\ indicates that the new database will be created on the A: disk drive. bankdb is the name chosen for this particular database and .mdb is the three letter extension given for *Microsoft DataBase* files.

It is advisable to keep the name of the database (bankdb in the above example) relatively short and do not use spaces or other punctuation in the name of the database. Also, the name of the database should reflect the database's contents.

Once the new database is created, the following main Access screen will appear:



The two main features of this main screen are the menu bar that runs along the top of the window and the series of *tabs* in the main window. The menu bar is similar to other Microsoft Office products such as Excel. The menus include:

- File - Menu items to Open, Close, Create new, Save and Print databases and their contents. This menu also has the Exit item to exit Access.
- Edit - Cut, Copy, Paste, Delete
- View - View different database objects (tables, queries, forms, reports)
- Insert - Insert a new Table, Query, Form, Report, etc.
- Tools - A variety of tools to check spelling, create relationships between tables, perform analysis and reports on the contents of the database.
- Window - Switch between different open databases.
- Help - Get help on Access.

The tabs in the main window for the database include:

- Tables - Displays any tables in the database.
- Queries - Displays any queries saved in the database.
- Forms - Displays any forms saved in the database.
- Reports - Displays any reports saved in the database.
- Macros - Displays any macros (short programs) stored in the database.
- Modules - Displays any modules (Visual Basic for Applications procedures) stored in the database.

In MS Access 2000, these tabs appear along the left hand side of the window by default. MS Access 2000 also adds some selections such as Web Pages and Favorites (not covered in this tutorial).

This tutorial focuses on the first four tabs: Tables, Queries, Forms and Reports.

4.1.4.1 Review of Starting Microsoft Access

To start Microsoft Access:

1. Make sure a formatted floppy disk is in drive A:
2. Use the Start button on the task bar to open: Programs -> MS Office -> Microsoft Access
3. To create a new database, choose **Blank Database** and specify a new file name for the database. Be sure to use the drive letter (A:) and a descriptive name for the new database. Click on the OK button to create the new database.

To open an existing database, choose **Open an Existing Database**, highlight *More Files...* and click on the OK button. Then navigate to the A: drive, highlight the existing database file on the floppy disk and click the OK button again to open the database.

To exit Access, pull down the File menu and select the Exit menu item.

5. Creating and Viewing Tables

Tables are the main units of data storage in Access. Recall that a table is made up of one or more *columns* (or *fields*) and that a given column may appear in more than one table in order to indicate a relationship between the tables.

From the business example discussed earlier, we concluded that two tables would be sufficient to store the data about **Customers** and their bank **Accounts**. We now give the step-by-step instructions for creating these two tables in Access.

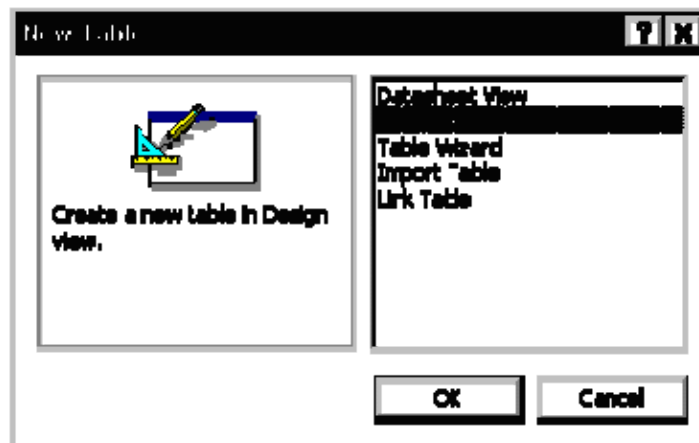
There are a number of ways to create a table in Access. Access provides *wizards* that guide the user through creating a table by suggesting names for tables and columns. The other main way to create a table is by using the *Design View* to manually define the columns (fields) and their data types.

While using the wizards is a fast way to create tables, the user has less control over the column names (fields) and data types. In this tutorial, we will describe the steps to create a table using the *Design View*. Students are encouraged to experiment on their own with using the Create Table wizard.

5.1. Creating a Table Using the Design View

To create a table in Access using the Design View, make sure the Tables tab is displayed (that is, Access should be set to work with tables rather than with queries, forms, reports, etc.) and perform the following steps:

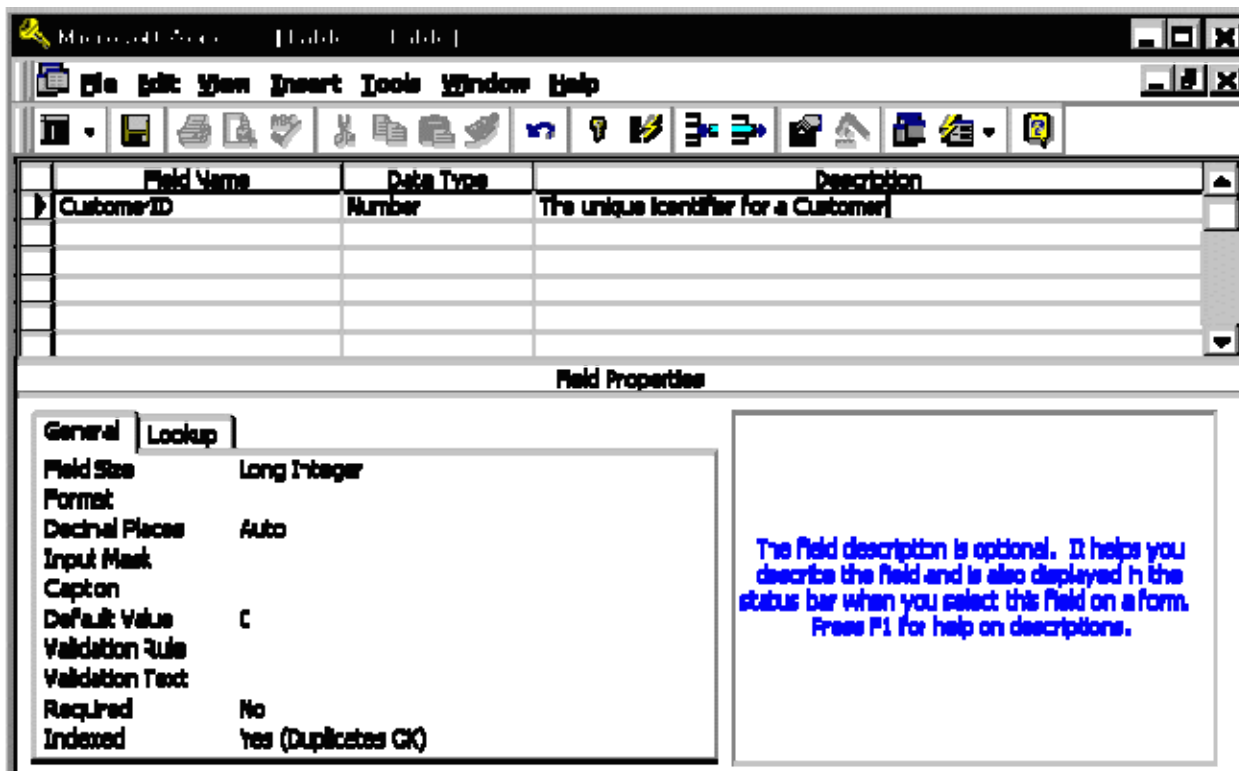
1. For Access, Click on the New button and highlight *Design View* in the dialog box that appears:



Then click on the OK button.

For Access 2000, double click on the "Create Table in Design View" item.

2. The Table Design View will appear. Fill in the **Field Name**, **Data Type** and **Description** for each column/field in the table. The CustomerID field is filled in below:



Note that the default name given for the table is Table1. In a later step, we will assign an appropriate name for this table.

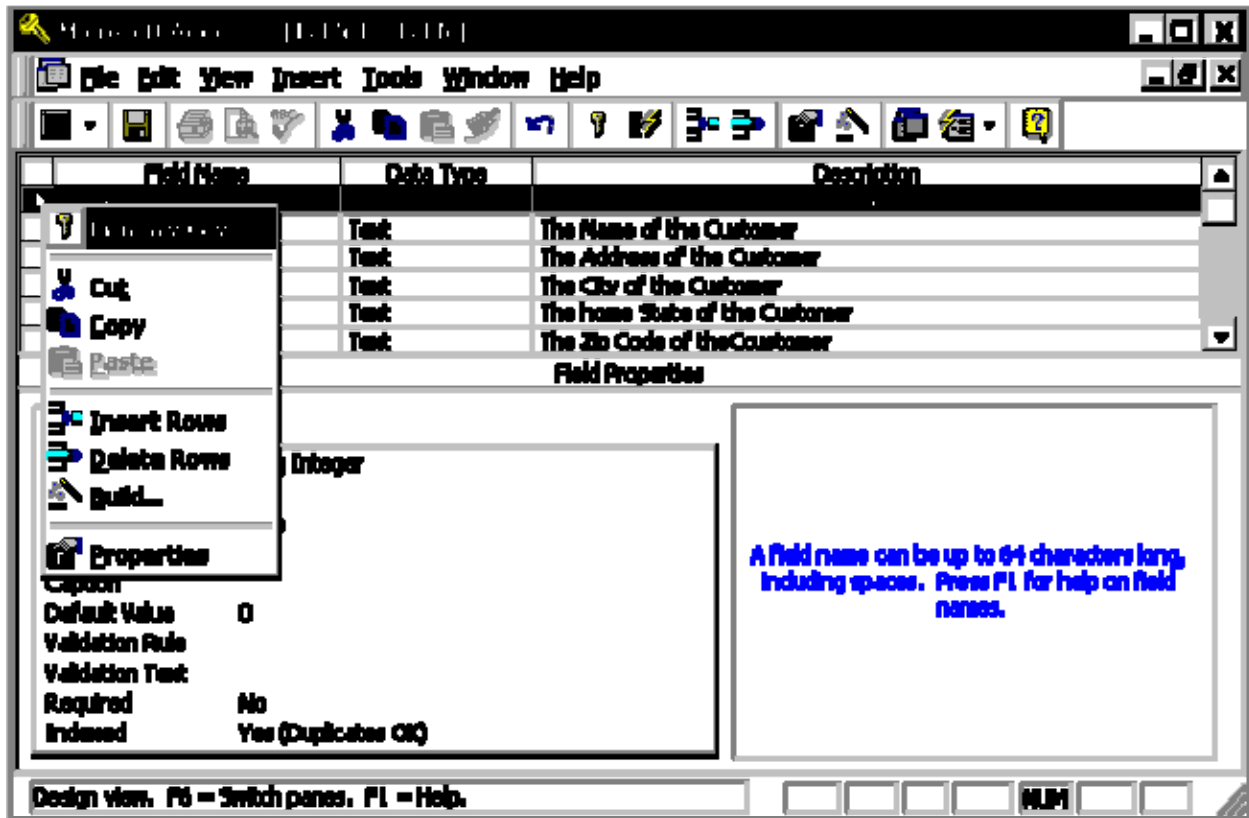
Fill in the information for the fields as follows:

Field Name	Data Type	Description
CustomerID	Number	The Unique Identifier for a Customer
Name	Text	The Name of the Customer
Address	Text	The Address of the Customer
City	Text	The City of the Customer
State	Text	The home State of the Customer
Zip	Text	The Zip Code of the Customer

A figure showing the design view with the new table definition filled in is given below:



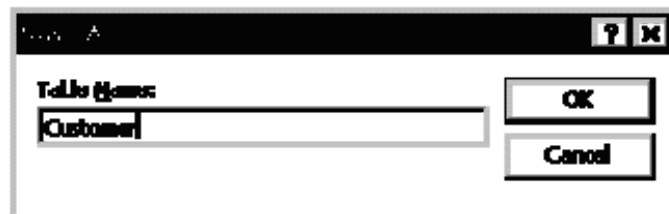
- Now that all of the fields have been defined for the table, a Primary Key should be defined. Click on the **CustomerID** field with the *Right* mouse button and choose Primary Key from the pop-up menu.



Notice that a small key appears next to the field name on the left side.

Note: To remove a primary key, simply repeat this procedure to toggle the primary key off.

- As a final step, the table must be saved. Pull down the File menu and choose the Save menu item. A dialog box will appear where the name of the new table should be specified. Note that Access gives a default name such as **Table1** or **Table2**. Simply type over this default name with the name of the table. For this example, name the table: **Customer** Then click on the OK button.



At this point, the new Customer table has been created and saved. Switch back to the Access main screen by pulling down the File menu and choosing the Close menu item. This will *close* the Design View for the table and display the Access main screen. Notice that the new Customer table appears below the Table tab.



When defining the fields (columns) for a table, it is important to use field names that give a clear understanding of the data contents of the column. For example, does the field CNO indicate a Customer Number or a Container Number ?

Field names in Access can be up to 64 characters long and may contain spaces. **However, the use of spaces in field names and table names is strongly discouraged.** If you wish to make field names easier to read, consider using an underscore character to separate words. However be certain no spaces appear before or after the underscore.

The following table summarizes some different ways to give field names:

Description	Bad	Good
Unique identifier for a customer	CID	CustomerID or Customer_ID
Description for a product	PDESC	ProductDescription
Employee's home telephone number	Employee_home_telephone_number	HomePhone
Bank account number	BA#	AccountNumber

5.2.Exercise: Creating a Table

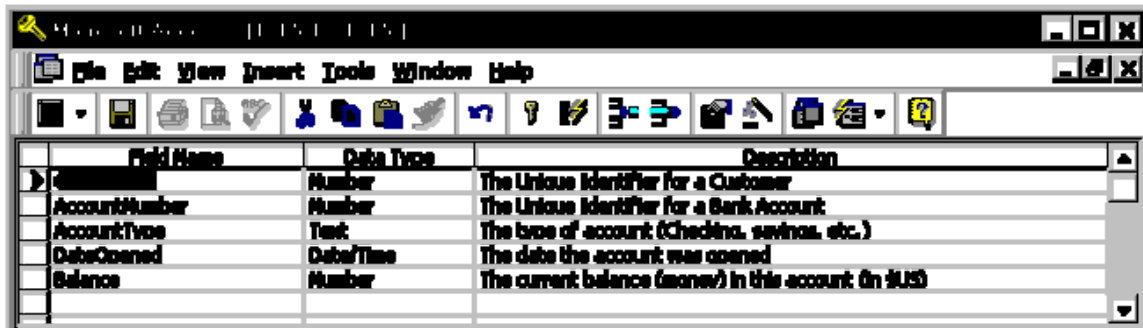
Create the *Accounts* table by following the same steps used to create the Customer table.

1. Click on the New button and highlight *Design View* in the dialog box that appears. Then click on the OK button.
2. The Table Design View will appear. Fill in the **Field Name**, **Data Type** and **Description** for each column/field in the Accounts table.

Field Name	Data Type	Description
CustomerID	Number	The Unique Identifier for a Customer
AccountNumber	Number	The Unique Identifier for a Bank Account

AccountType	Text	The type of account (Checking, savings, etc.)
DateOpened	Date	The date the account was opened
Balance	Number	The current balance (money) in this account (in \$US)

3. A figure showing the design view with the new table definition filled in is given below:



4. Define a Primary Key for the Accounts table. Click on the **AccountNumber** field with the *Right* mouse button and choose Primary Key from the pop-up menu.
5. Save the new Accounts table by pulling down the File menu and choosing the Save menu item. Fill in the name of the table: **Accounts** Then click on the OK button.

5.3. Viewing and Adding Data to a Table

Data can be added, deleted or modified in tables using a simple spreadsheet-like display. To bring up this view of a single table's data, highlight the name of the table and then click on the Open button.

In this view of the table, shown in the figure below, the fields (columns) appear across the top of the window and the rows or records appear below. This view is similar to how a spreadsheet would be designed.



Note at the bottom of the window the number of records is displayed. In this case, since the table was just created, only one blank record appears.

To add data to the table, simply type in values for each of the fields (columns). Press the Tab key to move between fields within a record. Use the up and down arrow keys to move between records. Enter the data as given below:

CustomerID	Name	Address	City	State	Zip
1001	Mr. Smith	123 Lexington	Smithville	KY	91232
1002	Mrs. Jones	12 Davis Ave.	Smithville	KY	91232
1003	Mr. Axe	443 Grinder Ln.	Broadville	GA	81992
1004	Mr. & Mrs. Builder	661 Parker Rd.	Streetville	GA	81990



To save the new data, pull down the File menu and choose Save.

To navigate to other records in the table, use the navigation bar at the bottom of the screen:

Records: 1 2 3 4 of 4

To modify existing data, simply navigate to the record of interest and tab to the appropriate field. Use the arrow keys and the delete or backspace keys to change the existing data.

To delete a record, first navigate to the record of interest. Then pull down the Edit menu and choose the Delete menu item.


To close the table and return to the Access main screen, pull down the File menu and choose the Close menu item.

5.4.Exercise: Adding Data to a Table

For this exercise, open up the Accounts table and add data for the seven accounts shown in section 2. Be sure to enter the data exactly as shown including the capitalization of the data in the AccountType field. e.g., type Savings instead of savings or SAVINGS.

Note that when entering the dates, type in the full four digits for the year. By default, Access only displays the last two digits of the year; however, all four digits are stored in the table.

Be sure to save the data when you are done. The figure below shows the Accounts table and data as it should appear when you are done with this exercise.



The screenshot shows the Microsoft Access interface with the 'Accounts' table open in Datasheet view. The table has five columns: CustomerID, AccountNumber, AccountType, DateOpened, and Balance. There are seven data rows and a total row at the bottom. The status bar at the bottom indicates 'Record: 1 of 7' and 'The current balance (money) in this account (in \$US):'.

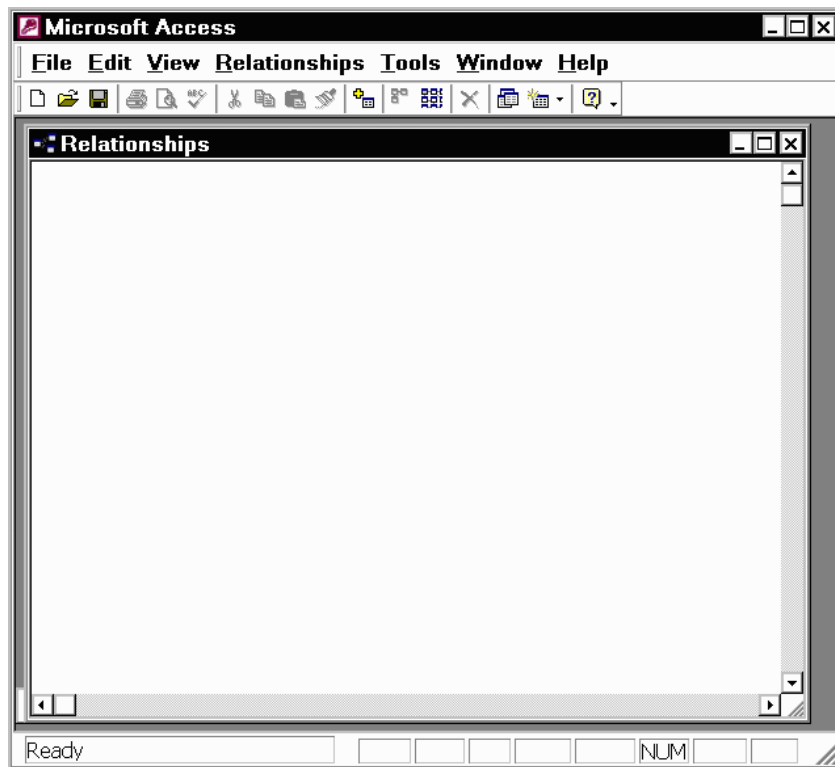
CustomerID	AccountNumber	AccountType	DateOpened	Balance
1001	9987	Checking	10/12/89	4000
1001	9980	Savings	10/12/89	2000
1002	6611	Savings	1/5/92	1000
1003	4422	Checking	12/1/94	8000
1003	4433	Savings	12/1/94	9000
1004	3322	Savings	8/22/94	600
1004	1122	Checking	11/13/88	800
0	0			0

At this point in the tutorial, we have created two tables, Customers and Accounts, and added data to each one. In the subsequent sections, we will cover how to query and report on the data in the tables and how to create a user-friendly data entry form using the Access wizards.

5.5. Creating Relationships Between tables

Recall that one of the main characteristics of relational databases is the fact that all tables are related to one another. In the Bank database thus far, the Customers table is related to the Accounts table by virtue of the CustomerID field appearing in both tables. Access has a means to make this relationship explicit using the Relationships screen. Access uses this information when designing reports, forms and queries that require more than one table to be displayed.

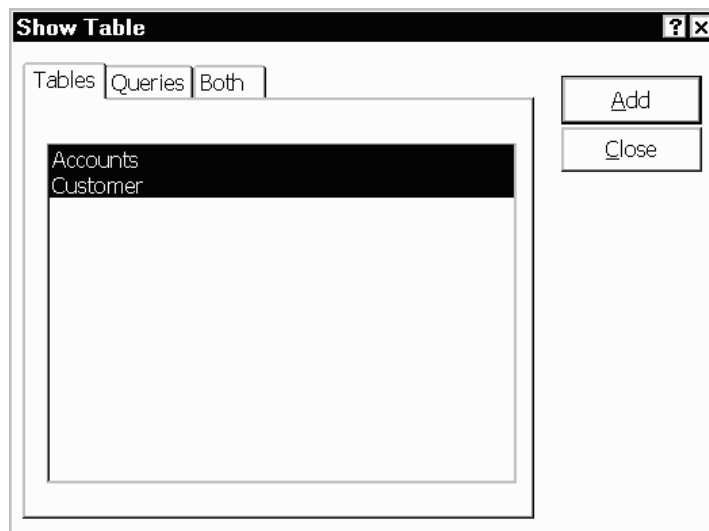
To get started, display the Relationships screen by pulling down the Tools menu and selecting the Relationships menu item. The blank Relationships screen will appear as follows:



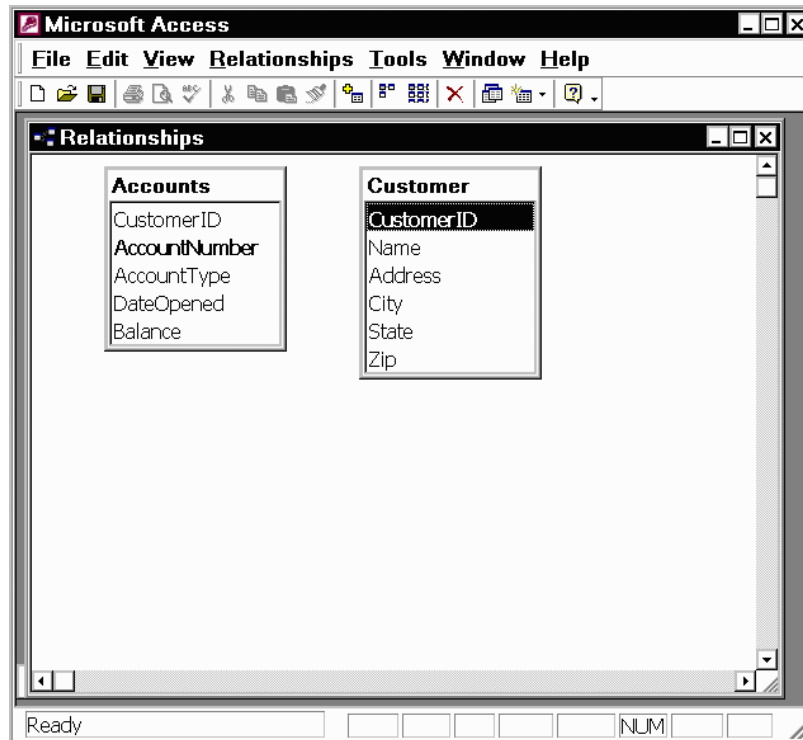
The next step is to display all of the tables on the relationships screen. Right click anywhere on the Relationships screen and select the Show Tables... option from the pop-up menu:



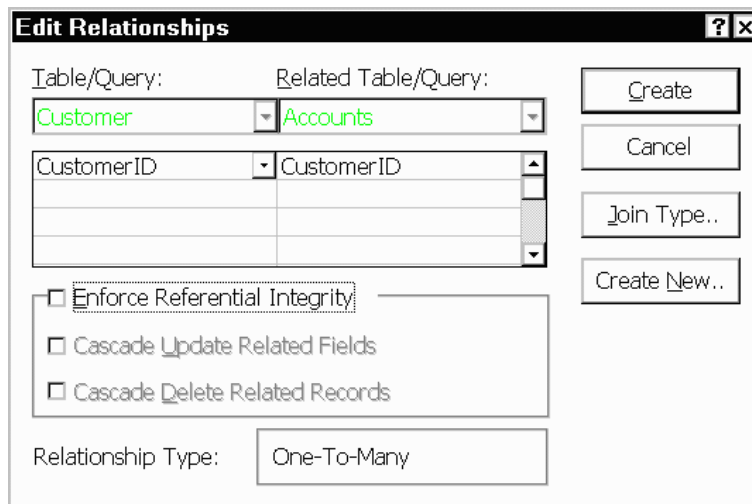
When the Show Table dialog box appears, highlight both the Customers table and the Accounts table as shown below and then click on the Add button.



Then click on the Close button to close this dialog box. The Relationships screen will now reappear with the two tables displayed as below:



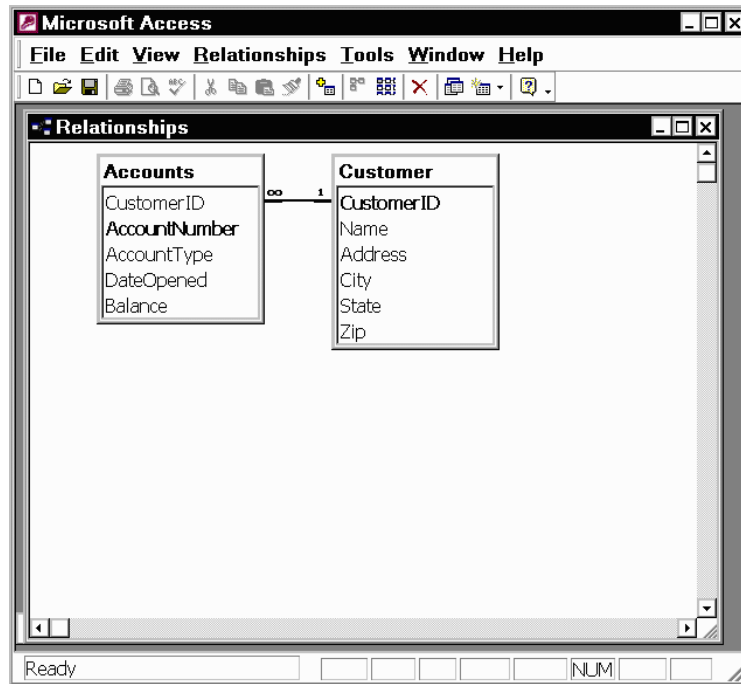
To connect the Customers table with the Accounts table to form a relationship, click on the CustomerID field in the Customers table and drag it over on top of the CustomerID field on the Accounts table. Upon releasing the mouse button, the Edit Relationships dialog box will appear as below:



Access will do its best to determine the Relationship Type (almost always *One-to-Many*). For this example, Access knows that CustomerID is a key of the Customer table so it chooses this field as the "One" side. This makes the Accounts table the "Many" side as *One* customer may have *Many* accounts.

One additional step to be taken is the check off the box labeled "Enforce Referential Integrity". This option puts constraints into effect such that an Accounts record can not be created without a valid Customer and Access

will also prevent a user from deleting a Customer record if a related Accounts record exists. At this point, click on the Create button to create the relationship. The Relationships screen should reappear with the new relationship in place as follows:



Note the symbols "1" (indicating the "One" side) and the infinity symbol (indicating the "Many" side) on the relationship. Close the relationships screen and select Yes to save the changes to the Relationships layout.

If the relationship does not appear in the above fashion, highlight it and press the delete key to delete it. Then go back to the table design view and make certain that the CustomerID field is designated as the key of the Customers table. Then go back to the Relationships screen and try to recreate the relationship.

5.6.Review of Creating and Viewing Tables

Creating a new table requires the following steps:

1. Click on the **Tables** tab on the Access main screen
2. Click on the New button.
3. Choose the **Design View** and click the OK button.
4. Fill in the name, data type and description of each of the fields in the table.
5. Designate a primary key by clicking on one of the fields with the right mouse button and then choose Primary Key from the pop-up menu.
6. Save the table by pulling down the File menu and choosing Save.
7. Close the new table by pulling down the File menu and choosing Close.

To change the design of an existing table (e.g., to add, change or delete a field):

1. Click on the **Tables** tab on the Access main screen
2. Highlight the name of the table to be modified and click on the Design button.
3. Make the necessary changes.
4. Save the table by pulling down the File menu and choosing Save.

5. Close the table by pulling down the File menu and choosing Close.

To add, delete or change data in an existing table:

1. Click on the **Tables** tab on the Access main screen
2. Highlight the name of the table to be modified and click on the Open button.
3. Make the necessary changes to the data.
4. Save the table data by pulling down the File menu and choosing Save.
5. Close the table by pulling down the File menu and choosing Close.

To create or edit relationships between tables:

1. Pull down the Tools menu and select the Relationships menu item.
2. To display tables, right click and choose Add Tables
3. To create new relationships, drag a key field from one table and drop it on the associated field in another table
4. To edit an existing relationship, double click on the relationship line.
5. To delete an existing relationship, click on the relationship line and press the delete key.

6. Creating and Running Queries

Queries are a fundamental means of accessing and displaying data from tables. Queries can access a single table or multiple tables. Examples of queries for our bank database might include:

- Which Customers live in Georgia ?
- Which Accounts have less than a \$500 balance ?

In this section, we show how to use the Access Wizards to create queries for a single table and for multiple tables.

6.1.Single Table Queries

In this section, we demonstrate how to query a single table. Single table queries are useful to gain a view of the data in a table that:

- only displays certain fields (columns) in the output
- sorts the records in a particular order
- performs some statistics on the records such as calculating the sum of data values in a column or counting the number of records, or
- filters the records by showing only those records that match some criteria. For example, show only those bank customers living in GA.

Creating a query can be accomplished by using either the query design view or the Query wizard. In the following example, we will use the query wizard to create a query.

Queries are accessed by clicking on the **Queries** tab in the Access main screen. This is shown below:



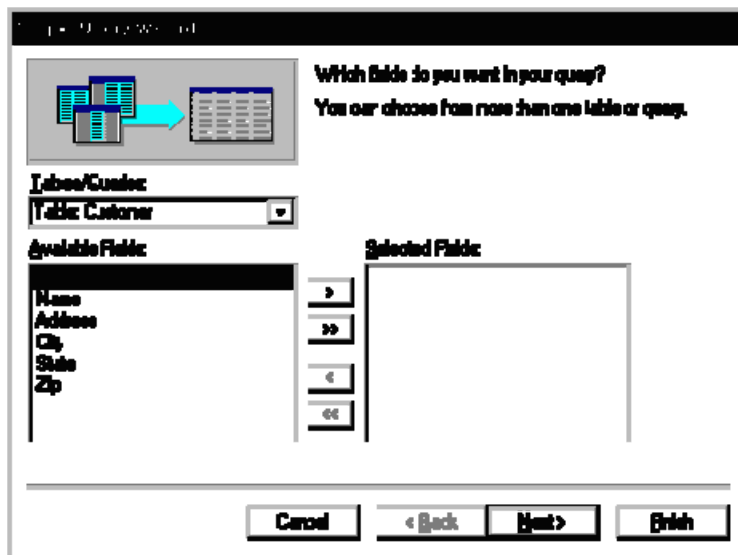
To create a new query, click on the New button. The New Query menu will appear as below. Select the Simple Query wizard option and click the OK button.




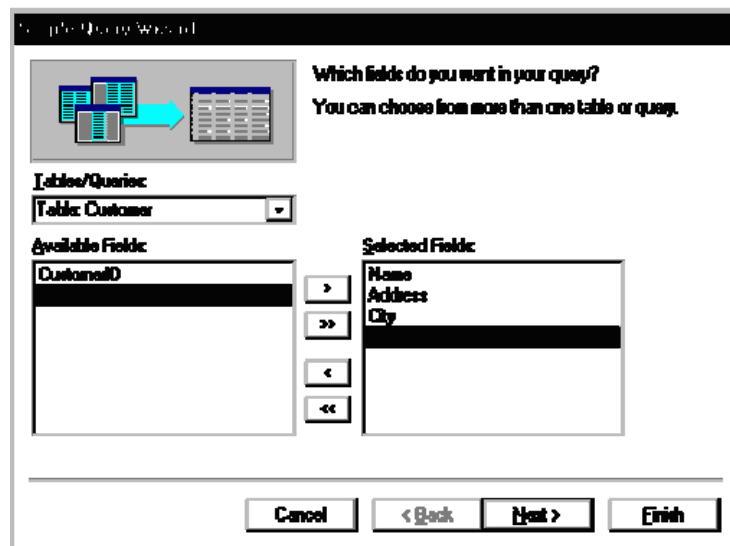
The first step in the Simple Query wizard is to specify the table for the query and which fields (columns) should be displayed in the query output. Three main sections of this step are:

1. Tables/Queries - A pick list of tables or queries you have created.
2. Available Fields - Those fields from the table that can be displayed.
3. Selected Fields - Those fields from the table that *will* be displayed.

For this example, pull down the Tables/Queries list and choose the Customer table. Notice that the available fields change to list only those fields in the Customer table. This step is shown below:



From the list of Available fields on the left, move the Name, Address, City and State fields over to the Selected Fields area on the right. Highlight one of the fields and then click on the right arrow button  in the center between the two areas. Repeat this for each of the four fields to be displayed. When done with this step, the wizard should appear as below:

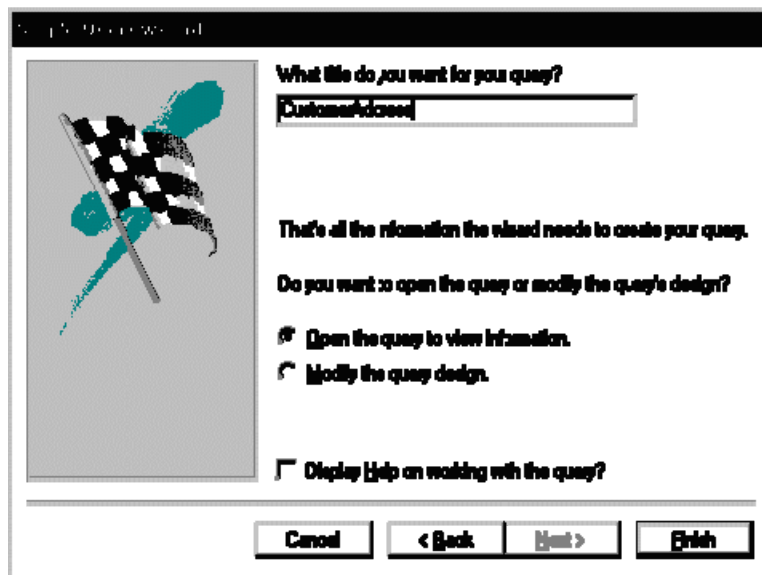


Click on the Next button to move to the next and final step in the Simple Query wizard.

In the final step, give your new query a name. For this example, name the query: Customer Address

At this point, the wizard will create the new query with the option to either:

- Open the query to view information - that is, the wizard will execute the query and show the data.
- Modify the query design - the wizard will switch to the Design View to allow further modification of the query.



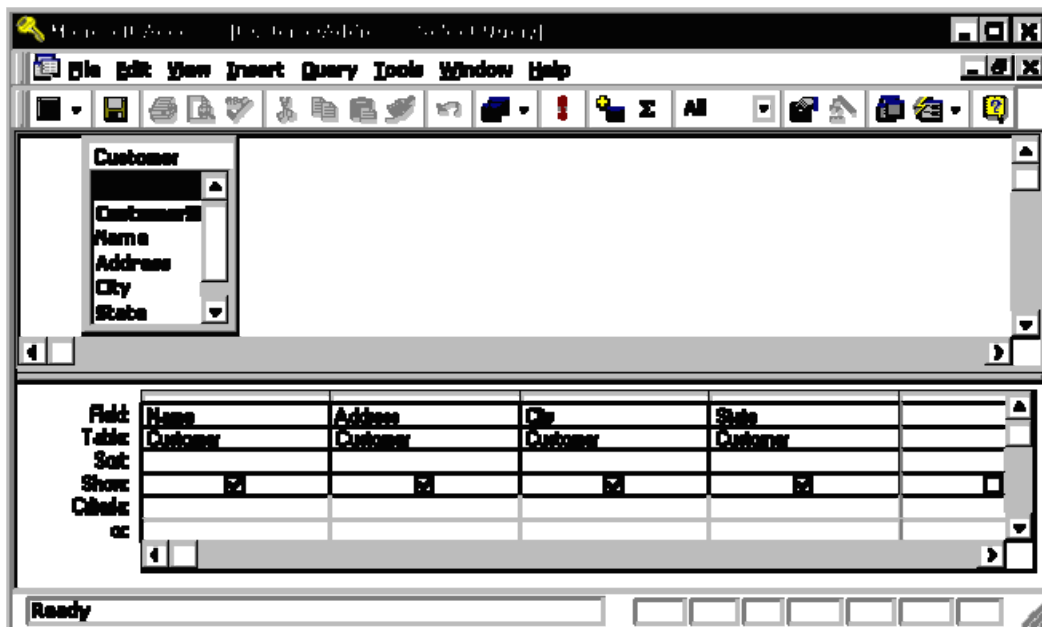
For this example, choose Open the query to view information and click on the Finish button. When this query executes, only the customer's name, address, city and state fields appear, however, all of the rows appear as shown in the figure below:



Close this query by pulling down the File menu and choosing the Close menu item. The Access main screen showing the Queries tab should appear. Note the new query CustomerAddress appears under the Queries tab.

In the following example, we will modify the CustomerAddress query to only display customers in a certain state. To accomplish this, we will make use of the Query Design View.

Open up the CustomerAddress query in the design view by highlighting the name of the query and clicking on the Design button. The design view will appear as in the figure below:



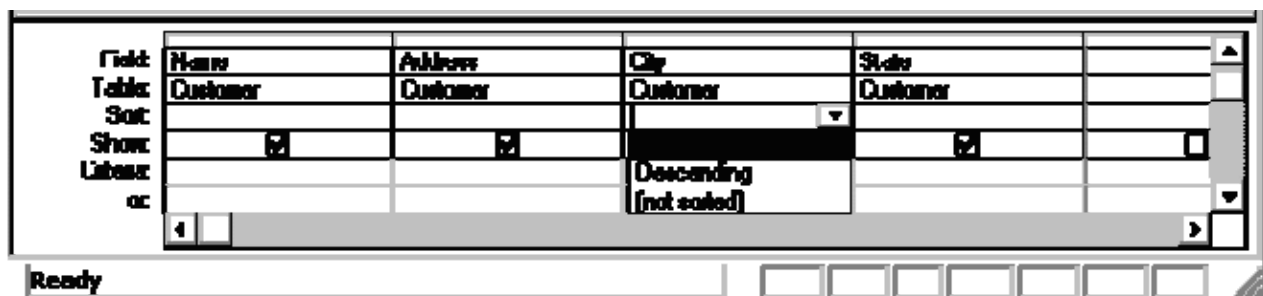
The Query Design view has two major sections. In the top section, the table(s) used for the query are displayed along with the available fields. In the bottom section, those fields that have been selected for use in the query are displayed.

Each field has several options associated with it:

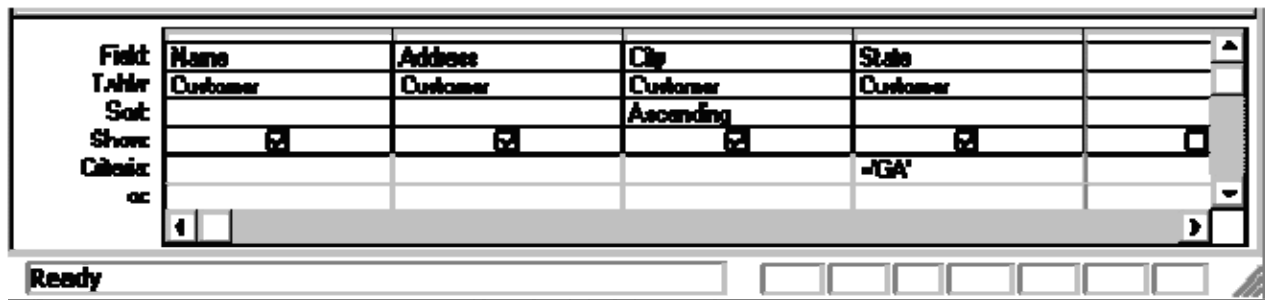
- Field - The name of the field from the table
- Table - The table the field comes from
- Sort - The order in which to sort on this field (Ascending, Descending or Not Sorted)
- Show - Whether or not to display this field in the query output
- Criteria - Indicates how to filter the records in the query output.

For this example, we will filter the records to only display those customers living in the State of Georgia (GA). We will also sort the records on the City field.

To sort the records on the **City** field, click in the Sort area beneath the **City** field. Choose Ascending from the list as shown in the figure below:



To filter the output to only display Customers in Georgia, click in the Criteria area beneath the **State** field and type the following statement: = 'GA'



The = 'GA' statement tells Access to only show those records where the value of the **State** field is equal to 'GA'.

Run the query by pulling down the Query menu and choosing the Run menu item. The output is shown in the figure below:



Finally, save and close this query to return to the Access main screen.

6.2.Exercise: Single Table Queries

For this exercise, use the Simple Query wizard to create a query on the Accounts table showing just the AccountNumber, AccountType and Balance fields.

1. From the Access main screen, click on the Queries tab. Then click on the New button.
2. Choose the Simple Query wizard option and click on the OK button.
3. Under Table/Queries: choose the Accounts table. Then move the AccountNumber, AccountType and Balance fields over to the Selected fields area. Then click the Next button.
4. In the next panel, you will be asked to choose between a detail or summary query. Choose detailed query and click on the Next button.
5. Name the new Query : AccountsQuery and click on the Finish button.

The output is shown below:

AccountNumber	AccountType	Balance
	Checking	800
3322	Savings	600
4422	Checking	8000
4433	Savings	9000
8811	Savings	1000
9980	Savings	2000
9987	Checking	4000
0		0

Records: 14 of 7

The Unique Identifier for a Bank Account

Close this query by pulling down the File menu and choosing Close.

In the next part of the exercise, we will modify the query to sort the output on the account number and only display the Savings accounts.

1. From the Queries tab on the Access main screen, highlight the AccountsQuery and click on the Design button.
2. Change the Sort order for the **AccountNumber** field to Ascending. Add the following statement to the Criteria: are under the **AccountType** field: = 'Savings'

Field	Table	Sort	Show	Criteria
AccountNumber	Accounts	Ascending	<input checked="" type="checkbox"/>	
AccountType	Accounts		<input checked="" type="checkbox"/>	= 'Savings'
Balance	Accounts		<input checked="" type="checkbox"/>	

Ready

3. Run the query by pulling down the Query menu and choosing the Run menu item. The output is shown below:

AccountNumber	AccountType	Balance
3322	Savings	600
4433	Savings	9000
8811	Savings	1000
9980	Savings	2000
0		0

Records: 14 of 4

The Unique Identifier for a Bank Account

4. Finally, save and close the query to return to the Access main screen.

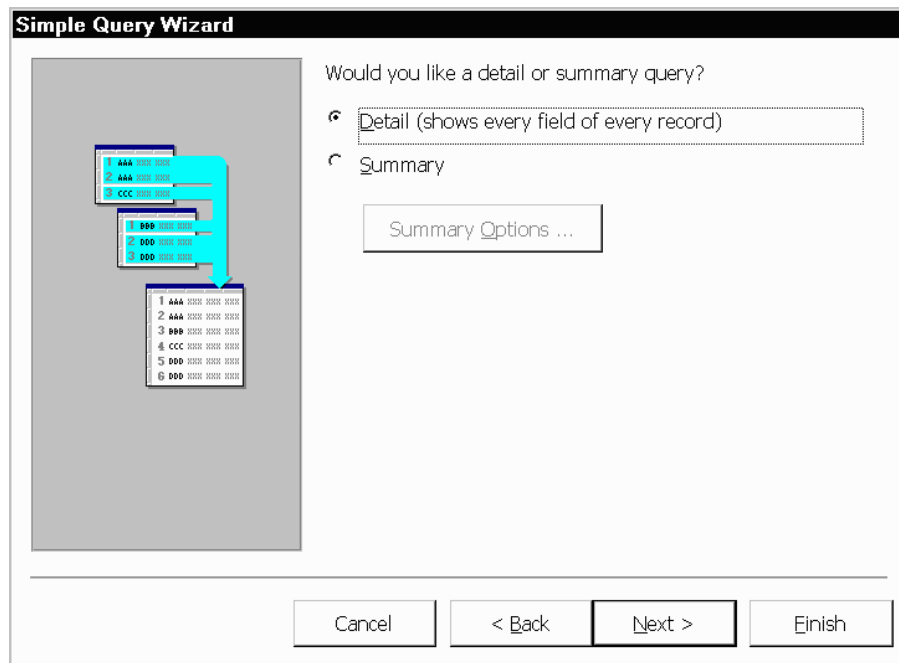
6.3. Multiple Table Queries

Up to this point, queries involving only one table have been demonstrated. It is almost a given that queries will need to involve more than one table. For this example, assume that a manager would like to see a list of all of the customers and the type of account(s) that each one maintains at the bank. Such a query requires data from both the Customers table as well as the Accounts table. In such queries, Access will rely on the Relationships established between tables to guide how the data will be assembled to satisfy the query.

Before proceeding with these next instructions, make certain the One-to-Many relationship between the Customers and Accounts table has been created.

To start the process of creating a multiple table query, highlight the Query tab (Access '97) and click on the New button to create a new query. Select the "Simple Query Wizard" option as was done previously. When the simple query wizard appears, select the CustomerID and Name fields from the Customers table, then switch the Tables/Queries selection to the Accounts table and select the CustomerID, AccountType and Balance fields from the Accounts table. The result from this step is down below:

Click the Next button to continue. In the next step of the wizard, an option will appear to provide some level of Summary. For this example, leave the default at "Detail ..." as shown below and then click on the Next button.



In the final step of the wizard, name the query "Customer Accounts Query" and click on the Finish button. The multiple table query results should appear as follows:

Microsoft Access - [Customer Accounts Query : Select Query]					
File Edit View Insert Format Records Tools Window Help					
Customer_Customers					
CustomerID	Name	Accounts_Cus	AccountType	Balance	
1001	Mr. Smith	1001	Savings	2000	
1001	Mr. Smith	1001	Checking	4000	
1002	Mrs. Jones	1002	Savings	1000	
1003	Mr. Axe	1003	Checking	6000	
1003	Mr. Axe	1003	Savings	9000	
1004	Mr. & Mrs. Builder	1004	Checking	800	
1004	Mr. & Mrs. Builder	1004	Savings	500	
*					

Record: 1 of 7

The Unique Identifier for a Customer

As with single table queries demonstrated previously, one can change the query definition in design view by adding filters (e.g., show account information for all customers in 'GA').

6.4.Exercise: Multiple Table Queries

For this exercise, create a new query called "Accounts Summary Query" that joins the Customers table (include the CustomerID and Name fields) with the Accounts table (include the Balance field only). In the second step of the wizard, click on the Summary choice (instead of Details) and then click on the Summary Options... button. Check off all of the Summary option boxes such as **Sum**, **AVG**, **Min** and **Max** as shown in the figure below:

Summary Options

What summary values would you like calculated?

Field	Sum	Avg	Min	Max
Balance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

☒ Count records in Accounts

OK Cancel

The resulting query should appear as follows:

Microsoft Access - [Accounts Summary Query : Select Query]

File Edit View Insert Format Records Tools Window Help

	CustomerID	Name	Sum Of	Avg Of Bal	Min Of B	Max Of Bal	Count Of Accounts
▶	1001	Mr. Smith	6000	3000	2000	4000	2
	1002	Mrs. Jones	1000	1000	1000	1000	1
	1003	Mr. Axe	15000	7500	6000	9000	2
	1004	Mr. & Mrs. Builder	1300	650	500	800	2

Record: 1 of 4

The Unique Identifier for a Customer

6.5. Review of Creating and Running Queries

In this section, the basic steps for creating and running queries were introduced. The query wizard can be used to create simple queries that access a single table. It is also possible to then modify the query to sort or filter the records.

Creating a query using the query wizard:

1. From the Access main screen, click on the Queries tab. Then click on the New button.
2. From the Queries tab on the main Access screen, click on the New button and choose the Simple Query wizard option.
3. Under Table/Queries: choose the appropriate table for the query and then indicate which fields in the table will appear in the query output.

If querying more than one table, change the Table/Queries: selection to display additional tables and select the necessary fields.

4. If the table contains numeric fields, either detailed or summary information may be specified for the query.
5. Finally, name the new query and click on the Finish button.

As a final note, Forms and Reports can be created based on existing queries.

7. Creating and Running a Data Entry Form

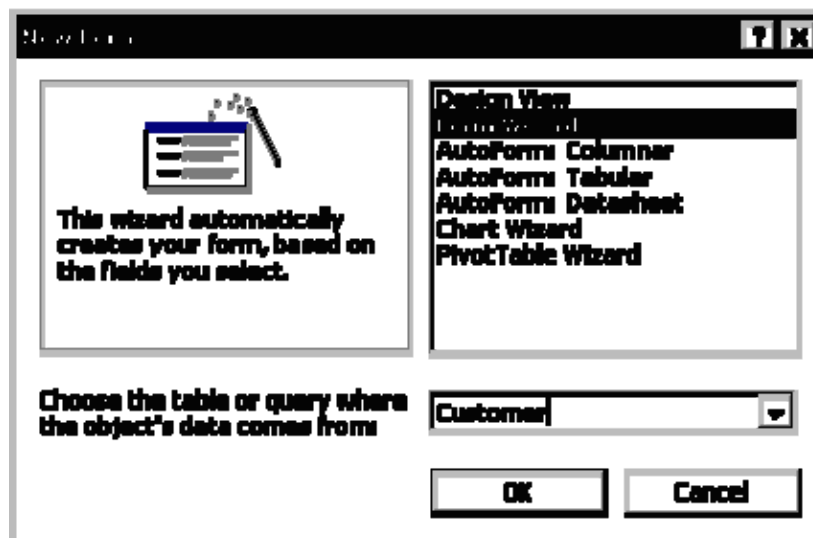
Data entry forms are the primary means of entering data into tables in the database. In a previous section, we described how to add data to a table using a spreadsheet-like view of the data. Data entry forms offer a more user-friendly interface by adding labels for each field and other helpful information.

Access provides several different ways of creating data entry forms. These include creating the forms by hand using a Design View as well as a number of wizards that walk the user through the forms creation process. In this section, we cover the basic steps for using a wizard to create a data entry form.

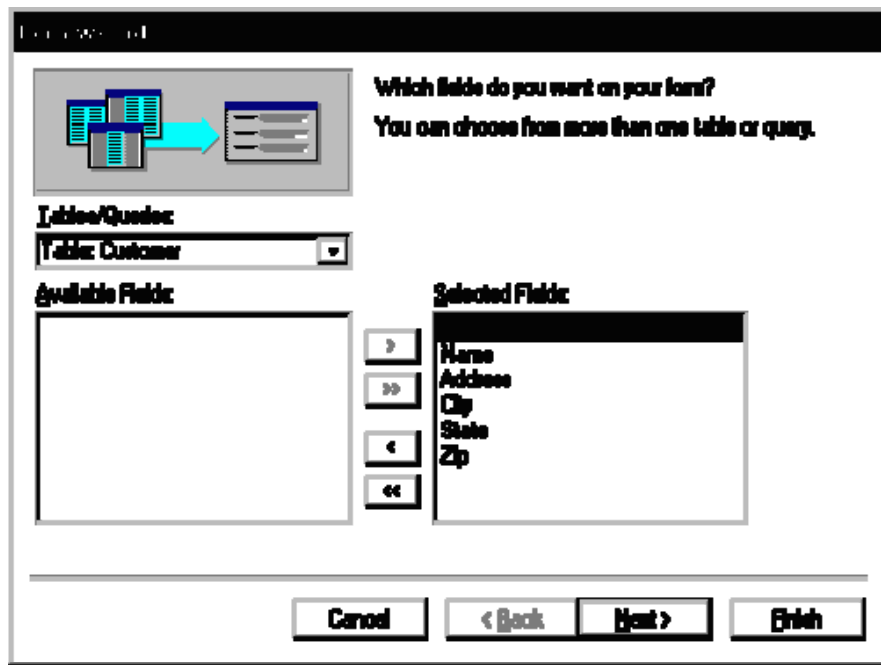
7.1. Creating a Single Table Form using the Wizard

In this example, we will create a simple data entry form for the Customer table. To begin the process, click on the Forms tab on the Access main screen. As with the other components in Access, there are buttons for creating a New form, Open an existing form and Design an existing form. For this example, click on the New button to create a new form.

A New Form dialog box will appear with several options for creating a new form. For this tutorial, choose the Form wizard. At the bottom of the dialog box, there is a prompt to supply the name of the table or query to be used for the new form. In this case, select the Customer table as in the following figure and then click on the OK button.



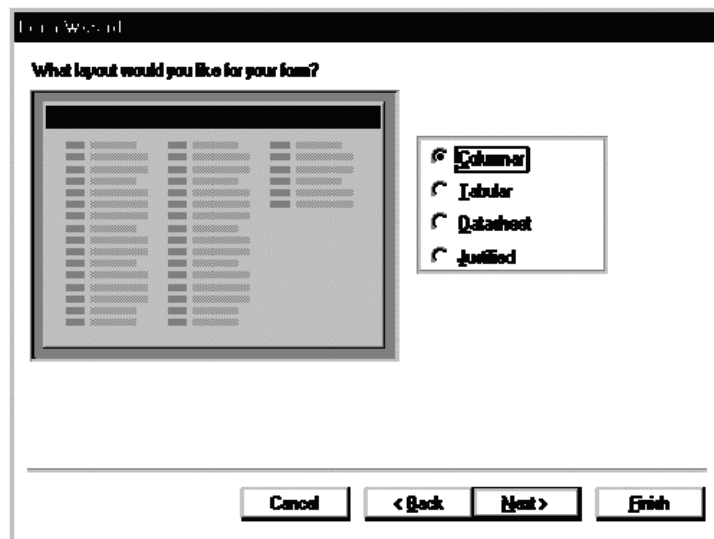
In the next step of the Form wizard, we need to specify the fields from the Customer table that will appear on the form. In this case, we want all of the fields to appear. Move each of the fields from the Available Fields side over to the Selected Fields side as in the following figure. Then click on the Next button.



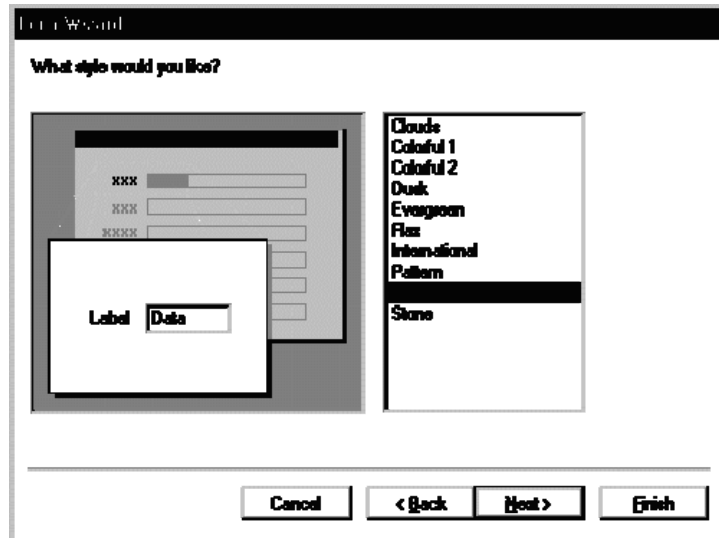
Forms can have several different layouts or arrangement of the labels and fields on the screen.

- Columnar - Places the labels to the left of each field. This is similar to a paper form. This layout is suitable for viewing data one record at a time.
- Tabular - Places the field labels at the top of the screen and the records are displayed below. This is similar to how a spreadsheet would display the data and is suitable for displaying multiple records of data at a time.
- Datasheet - The data appears in the same fashion as when viewing or adding data to a table.
- Justified - Places the labels above each field with the fields spread out on the form. This is suitable for viewing a single record at a time as with the columnar layout.

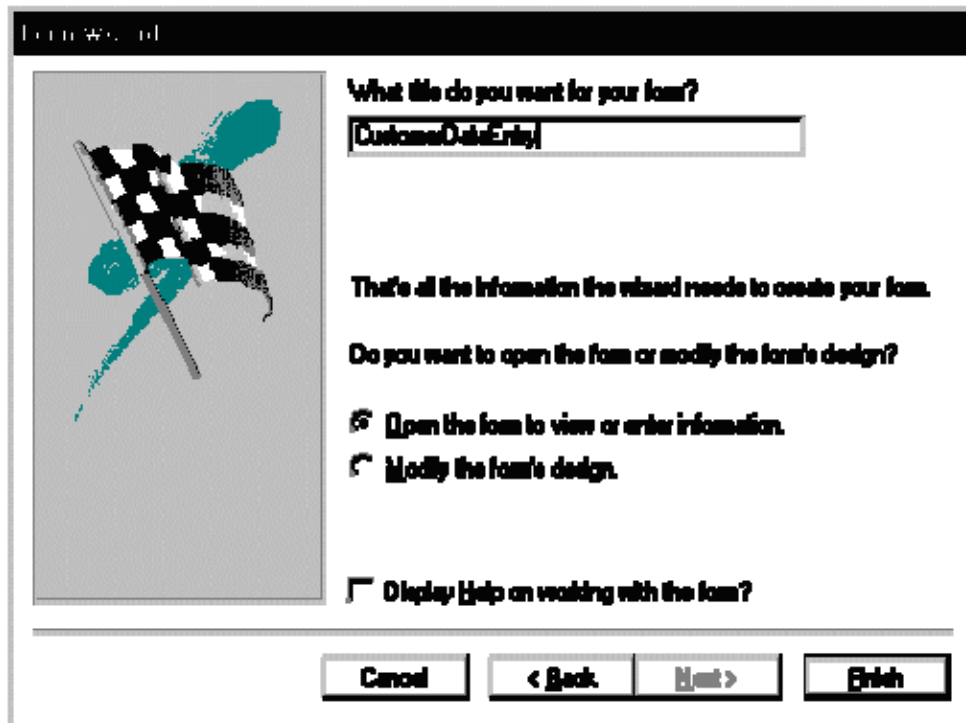
For this example, choose the columnar layout as shown in the figure below and click on the Next button.



Access has several sample display styles that determine how the form will appear, including elements such as fonts, colors and the background used in the form. For this example, select the Standard style as shown below and click on the Next button.



As a final step, give this new form the name: CustomerDataEntry and then click on the Finish button as shown below:



The new form will be created by the wizard and then opened. It should appear as in the figure below:

The screenshot shows a Microsoft Access form titled "Customers" with a menu bar (File, Edit, View, Insert, Format, Records, Tools, Window, Help) and a toolbar. The form contains several text boxes for data entry:

- CustomerID: 1001
- Name: Mr. Smith
- Address: 123 Lexington
- City: Smithville
- State: KY
- Zip: 91232

At the bottom of the form, there is a navigation bar with buttons for navigating between records. The status bar at the very bottom indicates "The Unique Identifier for a Customer".

Use the tab key to navigate between fields in the form. To move to the next or previous record, use the record navigation bar at the bottom of the form: Record: 2 of 4

The buttons on the navigation bar perform the following functions:

- Go to the first record.
- Go to the previous record.
- Go to the next record.
- Go to the last record.
- Go past the last record to add a new record.

To close the form and return to the Access main screen, pull down the File menu and choose Close.

To open the form at any time, highlight the form name under the Forms tab on the Access main screen and click on the Open button.

7.2.Exercise: Creating a Single Table Form

For this exercise, we will create a data entry form for the Accounts table created in a previous exercise.

- Click on the Forms tab on the Access main screen and then click on the New button to create a new form.
- Select the Form wizard and select the Accounts table. Then click the OK button.
- Select all of the available fields and click on the Next button.
- Choose a Tabular layout and click on the Next button.
- Choose the Standard style and click on the Next button.
- Name the form: AccountsDataEntry
- Then click on the Finish button to create, save and view the new form.

The new form is shown in the figure below:

CustomerID	AccountNumber	AccountType	DateOpened	Balance
1004	1122	Checking	11/13/88	800
1004	3322	Savings	8/22/94	500
1003	4422	Checking	12/1/94	6000
1003	4433	Savings	12/1/94	9000
1002	8811	Savings	1/5/92	1000
1001	9980	Savings	10/12/89	2000
1001	9987	Checking	10/12/89	4000
* 0	0			0

Records: 14 | 1 of 7

The Unique Identifier for a customer

Close the form and return to the Access main screen, by pulling down the File menu and choosing Close.

7.3. Review of Creating and Running a Data Entry Form

The basic steps for creating a simple data entry form are:

1. Choose a table and a form wizard
2. Specify the fields (columns) that will appear in the form
3. Specify the layout for the form
4. Specify the style (fonts/colors, etc.) for the form
5. Save, create and run the new form

In this section we covered the basic steps required to create and run a data entry form. Access provides wizards which are adept at building simple forms with a minimal amount of work. More advanced work on forms would concentrate on using the Design View to change a form's appearance and to add or remove fields and labels once a form is created.

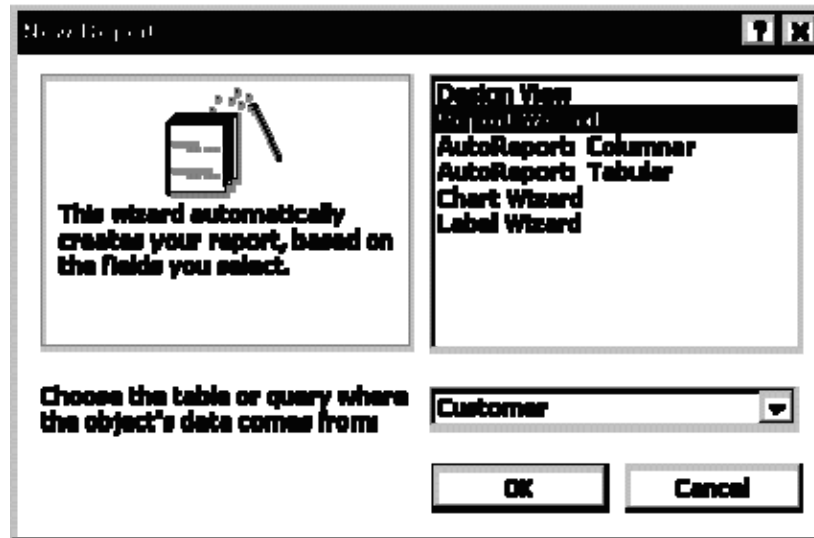
8. Creating and Running a Report

Reports are similar to queries in that they retrieve data from one or more tables and display the records. Unlike queries, however, reports add formatting to the output including fonts, colors, backgrounds and other features. Reports are often printed out on paper rather than just viewed on the screen. In this section, we cover how to create simple reports using the Report wizard.

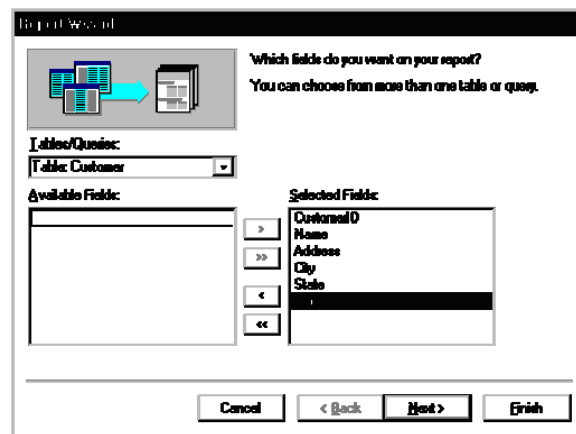
8.1. Creating a Single Table Report using the Wizard

In this example, we will create a simple report for a single table using the Report wizard. As with the Queries and Forms, we begin by selecting the Reports tab from the Access main screen.

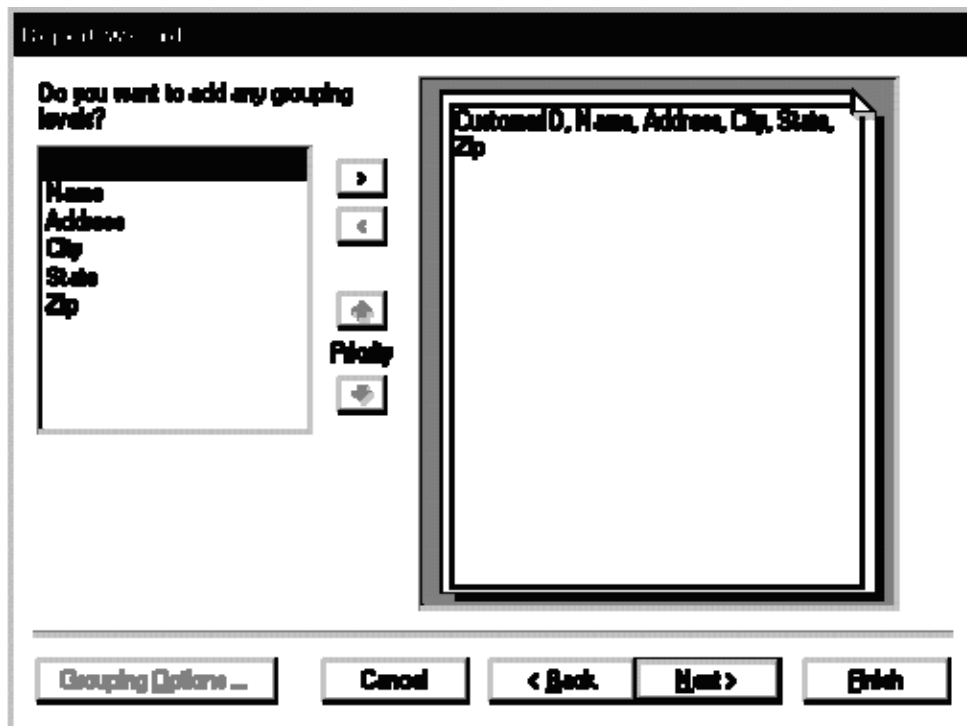
To create a new report, click on the New button. The New Report dialog box will appear as shown below. Select the Report wizard and then select the Customer table as shown below. Then click the OK button.



In the next step of the Report wizard, we need to specify the fields from the Customer table that will appear on the report. In this case, we want all of the fields to appear. Move each of the fields from the Available Fields side over to the Selected Fields side as in the following figure. Then click on the Next button.



In the next step, we have the opportunity to add *Grouping Levels* to the report. A grouping level is where several records have the same value for a given field and we only display the value for the first records. In this case, we will not use any grouping levels so simply click on the Next button as shown below.



Report Wizard

Do you want to add any grouping levels?

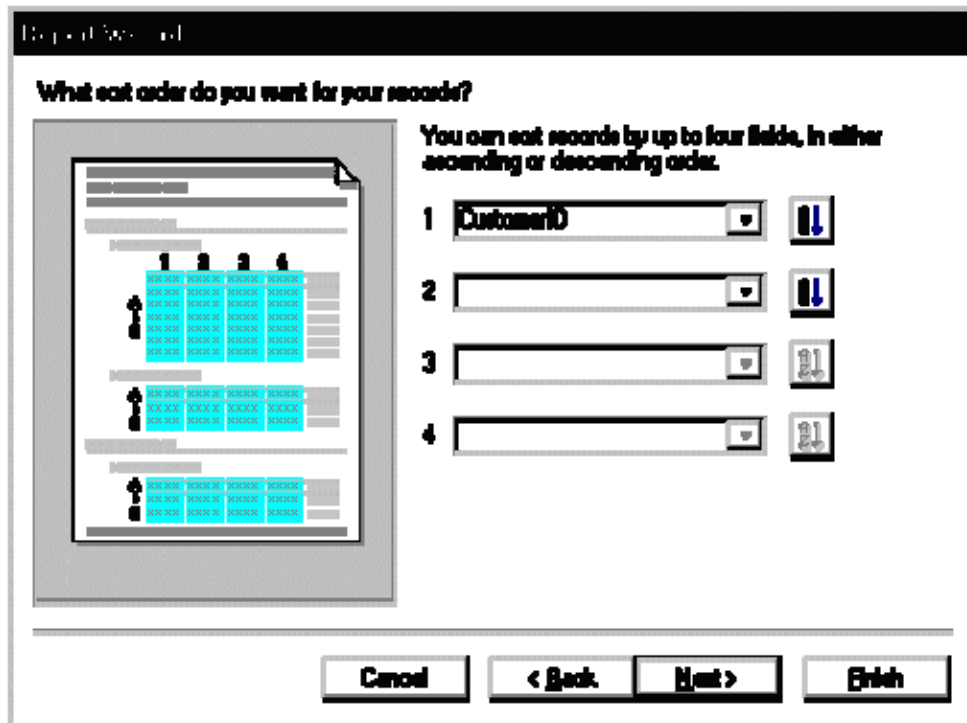
Name
 Address
 City
 State
 Zip

>
 <
 < Priority >
 >

CustomerID, Name, Address, City, State, Zip

Grouping Options ... Cancel < Back Next > Finish

In the next step, we are given the opportunity to specify the sorting order of the report. For this example, we will sort the records on the CustomerID field. To achieve this, pull down the list box next to the number 1: and choose the CustomerID field as shown in the figure below. Then click on the Next button.



Report Wizard

What sort order do you want for your records?

You can sort records by up to four fields, in either ascending or descending order.

1 CustomerID [Sort Order: Ascending]
 2 [Sort Order: Ascending]
 3 [Sort Order: Ascending]
 4 [Sort Order: Ascending]

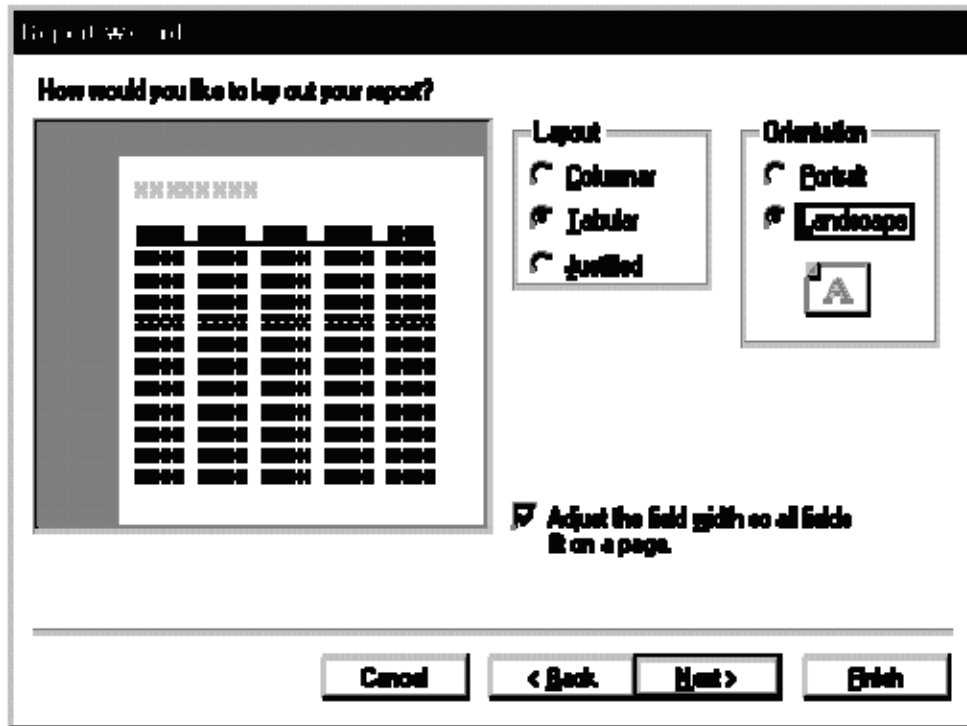
Cancel < Back Next > Finish

The next step is to specify the layout of the report. The three options are:

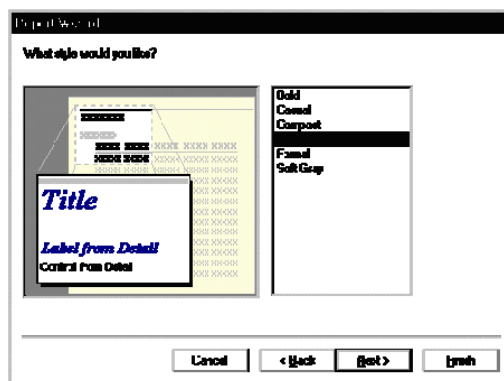
- Columnar - Places the labels to the left of each field. This is similar to a paper form.

- Tabular - Places the field labels at the top of the report page and the records are displayed below. This is similar to how a spreadsheet would display the data.
- Justified - Places the labels above each field with the fields spread out on the report page.

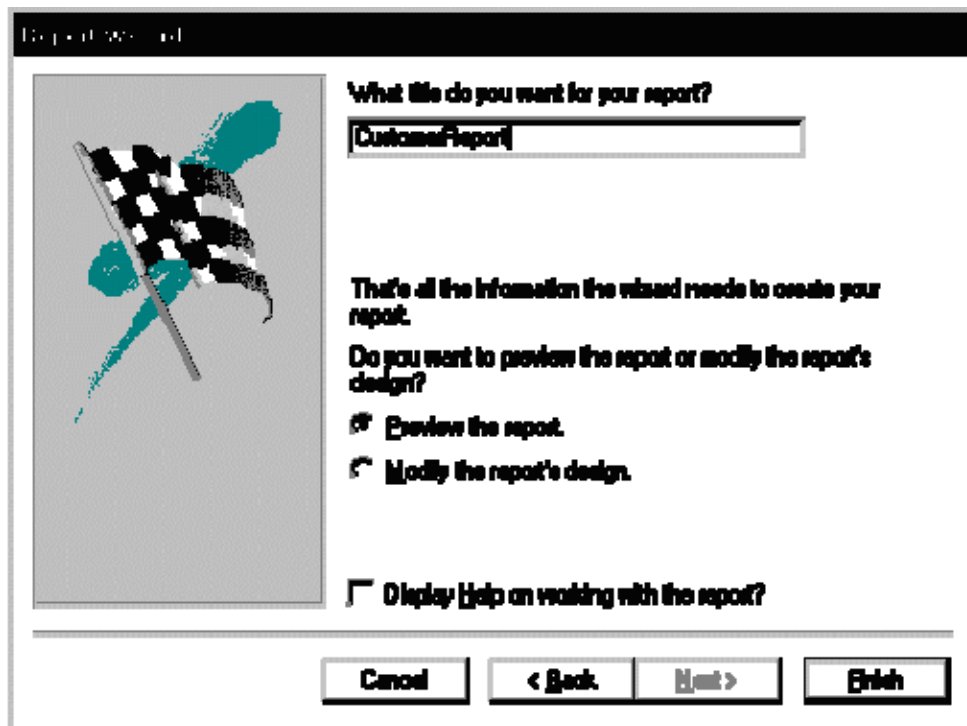
Generally, reports use the tabular layout. For this example, choose Tabular layout and set the page Orientation to Landscape so that all of the fields will fit across one page. This is shown in the figure below. Click on the Next button to continue.



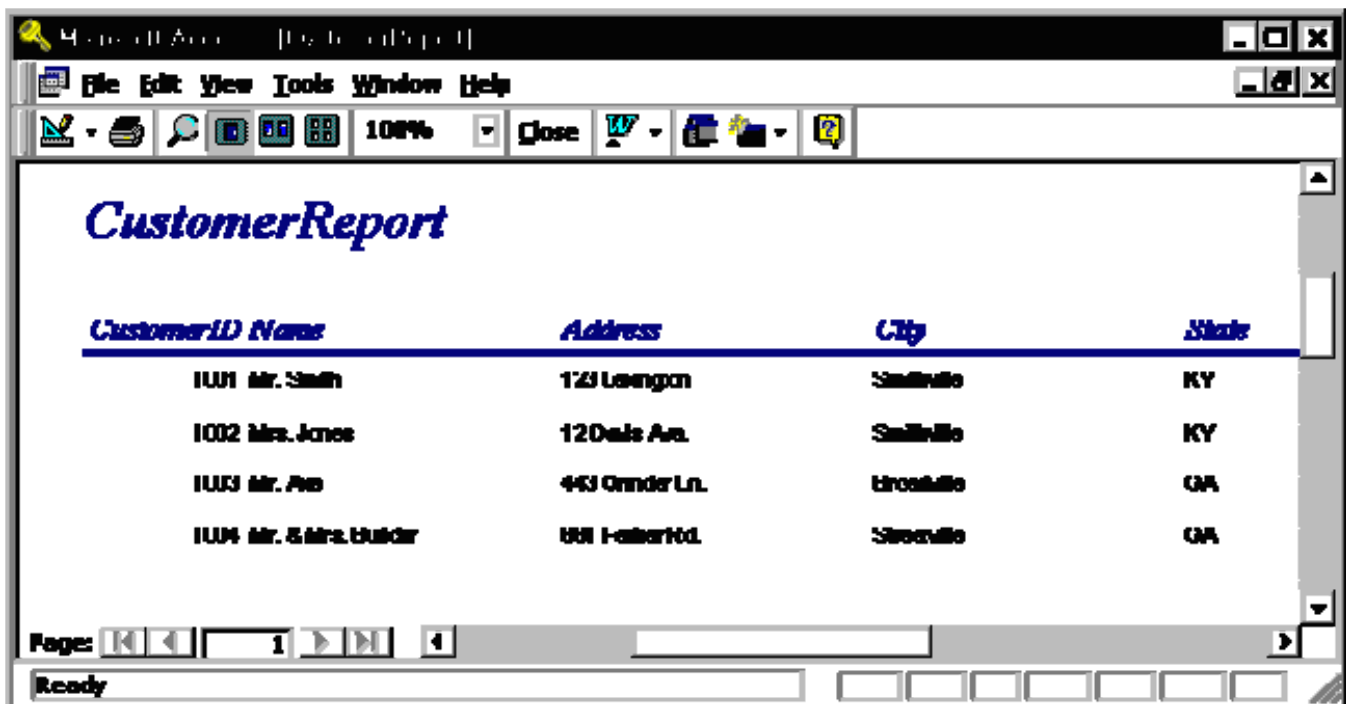
In the next step, the style of the report can be selected. For this example, choose the Corporate style and click on the Next button to continue.



Finally, give a name for the new report: CustomerReport and then click on the Finish button to create, save and display the new report.

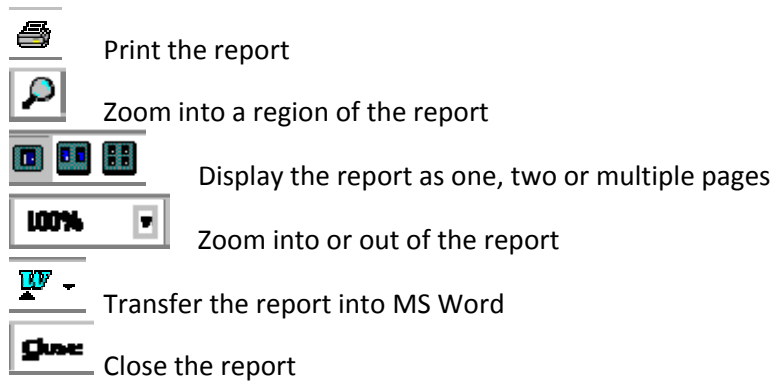


The output from the report is shown in the figure below. Note that on some screens, the last field, Zip, may not display without scrolling over to the right.



Once the report is displayed, it can be viewed, printed or transferred into Microsoft Word or Microsoft Excel.

The button bar across the top of the screen has the following functions:




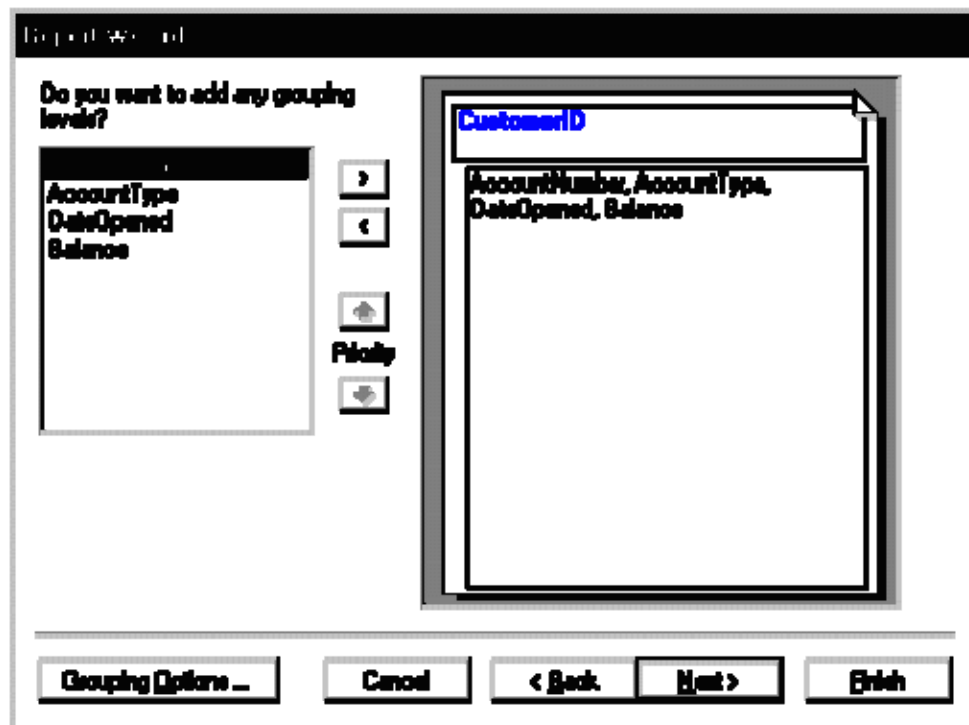
To close the report and return to the Access main screen, pull down the File menu and choose Close or click on the Close button.

8.2.Exercise: Creating a Single Table Report

For this exercise, we will create a report showing all of the Accounts information.

1. From the Reports tab on the Access main screen, click on the New button.
2. Select the Report wizard, select the Accounts table and then click the OK button.
3. Select all of the fields in the Accounts table by moving them all over to the Selected Fields side and then click Next
4. Group the report by CustomerID by clicking on the CustomerID field and then clicking on the right arrow

 button. This is shown in the following figure:



Click on the Next button.

- Choose to sort the report on the AccountNumber field. Note that a new button will appear called Summary Options.

Click on the Summary Options button. Choose the Balance field and select the Sum option. Choose the option to show both Detail and Summary data. Then click on the OK button.

Click on the Next button.

- Choose a Block layout and click on the Next button.

7. Choose the Corporate style and then click on the Next button.
8. Finally, name the report: AccountsReport and click on the Finish button to create, save and run the report.

The output from the AccountsReport is shown below:

CustomerID	AccountNumber	AccountType	DateOpened	Balance
1001	0000	Savings	10/12/00	2000
	0007	Checking	10/12/00	4000
Summary for 'CustomerID' = 1001 (2 detail records)				
Sum				6000
1002	0011	Savings	1/5/02	1000
Summary for 'CustomerID' = 1002 (1 detail record)				
Sum				1000
1003	4422	Checking	12/1/04	8000
	4433	Savings	12/1/04	8000
Summary for 'CustomerID' = 1003 (2 detail records)				
Sum				16000
1004	1122	Checking	11/13/00	800
	3322	Savings	8/22/04	800
Summary for 'CustomerID' = 1004 (2 detail records)				
Sum				1600
Grand Total				23300

Note the Grouping at the level of the CustomerID and the Sum for each customer's balances.

To close the report and return to the Access main screen, pull down the File menu and choose Close.

8.3.Review of Creating and Running a Report

As can be seen in the report exercise, there are many ways to create reports to show summarization, sorting and layout of the data. Further study of Reports will show how to modify the layout using the Design View. Students are encouraged to work with the Report wizards to create different styles and types of reports.