

## ***Course Topics:***

- I. Microsoft Excel Overview**
- II. Navigating Spreadsheets in Excel**
- III. Entering and Editing Data**
- IV. Using Formulas and Functions**
- V. Sorting and Filtering Data**
- VI. Applying a Custom AutoFilter**

## **Section 1 – Overview**

### ***What is Microsoft Excel?***

Microsoft Excel is a **spreadsheet** program, which means that it is primarily used to create and edit numbers and text in cells. A **cell** is the intersection of a column and a row and can contain an unlimited amount of characters.

A spreadsheet used to be a large sheet of grid-lined paper that spread across a desk; it was used in accounting to keep columns of numbers lined up. When computerized spreadsheets were developed, this grid structure was kept intact.

Computerized spreadsheets have many advantages over the old paper spreadsheets. Formatting is much easier, and Excel can perform calculations on spreadsheet data that would be impossible on a paper sheet! Spreadsheets are contained in a file called a **workbook**. Microsoft Excel includes many helpful features to enhance the text and layout of spreadsheets.

### ***Overview of Exercises for Level 1***

1. Start **Microsoft Excel** (**Start > All Programs > Microsoft Office > Microsoft Office Excel 2003**). A blank workbook called "Book1" automatically opens. Look over the interface. Click the smaller **Close Window** button to close it.
2. **Open** the file called "**IntroDone.xls**" (**File > Open > Desktop > Training > Excel**).
3. **Scroll** through the spreadsheet, noting the major features to be discussed in Level 1.

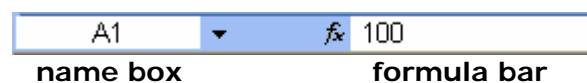
## Section 2 – Navigating Spreadsheets in Excel

### Using Columns and Rows

Data are entered in columns (vertical) and rows (horizontal). **Columns are lettered** A-Z (then AA-AZ, BA-BZ, and so on, through column IV). **Rows are numbered**. There are 256 columns and 65,536 rows in every spreadsheet. That's a total of more than **16 million cells per sheet!** A **cell** is the intersection of a column and a row. (Example, cell A1 is at the intersection of column A, row 1.)

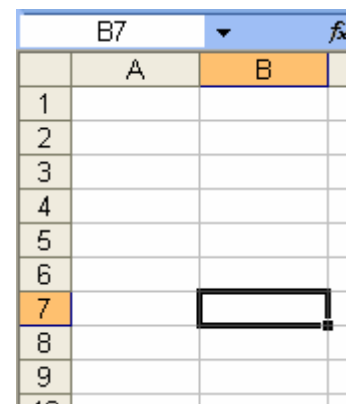
### Scrolling Through the Spreadsheet

Clicking on a cell **selects** that cell. When a cell is selected, the **Name Box** indicates which cell is active, and the **formula bar** displays the contents of that cell. Note that the formula may be different than what is displaying in the cell when you look at the spreadsheet.



**Entering and editing** text is accomplished by **double-clicking** the mouse pointer over the desired place and clicking a fine area in the cell called the "insertion point." This is the point at which text will begin to be entered, a selection will begin, or a graphic or other file will be inserted. The mouse arrow changes to a text selection pointer called the "**I-Beam**" pointer. I

1. **Open** the file called "**Introduction.xls**" Click on cell **B7**. The **Name Box** indicates that B7 is the active cell. Click in another location, and the Name Box changes.
2. To select **multiple cells**, click in the middle of on cell, then **drag-select** the desired range of cells using the large white cross pointer (☒).



3. Scroll using the **scroll bar arrows** on the right side of the screen. Note that as you scroll, the **active cell does not change**. Also try scrolling by clicking above or below the scroll button, as well as dragging and dropping the scroll button itself. Use the **horizontal scroll bar** to view additional columns; use the **vertical scroll bar** to view additional rows.

4. Several ways to **select cells** without using the mouse:
  - a. Press the **arrow keys** on the keyboard to scroll one row at a time (up or down), or one column at a time (right or left).
  - b. The **enter** key moves down one cell, the **tab** key moves to the right.
  - c. Also use the **Page Up** and **Page Down** keys, above the arrow keys.
  - d. Press the **Home** key to move to the **beginning** of a row.
  - e. Press the **End** key then any **arrow** key to move to the next major row or column group which contains data.
  - f. Press **Ctrl+Home** to jump to the first active cell in the spreadsheet.
  - g. Press **Ctrl+End** to jump to the last active cell in the spreadsheet.

**Note that all keyboard movements change the active cell.**

### ***Changing the Zoom Display***

Use the Zoom Box to change the magnification of the data on the screen. The Zoom Box only changes the view of what is on the screen; it **does not change the printed worksheet or active cell.**

1. Select Sheet 2 then click the **down arrow** next to the **Zoom Box** and select **50%**.

The spreadsheet zooms out.

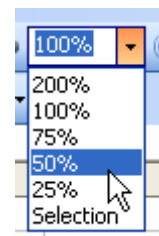
2. Click again on the **down arrow** and change the zoom to **200%**.

The spreadsheet zooms in on the active cell.

3. Click inside the **Zoom Box**, type an amount of **73**, then press **Enter**.

The spreadsheet zooms to a custom zoom of 73%.

4. Reset the zoom to **100%** to return the spreadsheet to its original size.

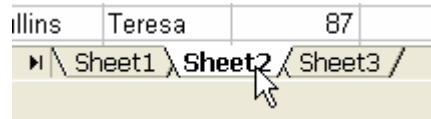


## ***Navigating to Other Worksheets***

A **workbook** can contain an unlimited number of **worksheets**. The default number of worksheets in a new workbook is **3**. (The default can be changed under **Tools > Options > General**)

1. Click the **Sheet2** tab at the bottom of the window.

Sheet2 displays, with cell A1 active. **Click on cell B8.**



2. Click the **Sheet3** tab.


Sheet3 displays, with cell A1 active.

3. Click on the **Sheet2** tab. Note that cell **B8 is still the active cell.**
4. Click on the **Sheet1** tab. Note that the last active cell is still active. Excel tracks the active cell in each worksheet until the workbook is closed, at which time all sheets return to the active cell when the workbook was last saved.


## ***Deleting Sheets***

1. **Right-click** the **Sheet3** sheet tab and choose **Delete**.

If the worksheet contains any data, a dialog box displays warning that the entire sheet and all its data will be permanently deleted.

2. Click **Delete** to delete the sheet.
3. Return to **Sheet1** and **Save** (**File > Save** or ) the file.

## ***Closing a Workbook***

Click the workbook's **close window** button (the lower  icon) to close it (Or choose **File > Close**). Close all open workbooks. The screen shows a blank, gray application screen.

## Section 3 – Entering and Editing Data

### *Entering Data in a Blank Worksheet*

1. **Open** the file called “**Introduction.xls**”. We will create a simple **Budget Spreadsheet** using a blank worksheet in Excel.
2. Ensure that **Sheet1** is blank and that **Sheet2** has student names and grades. Return to **Sheet 1**.
3. Type “**Cash on Hand**” in cell **A3** and press **Enter**.
4. Type “**Paycheck**” in cell **A4** and press **Enter**.  
(The number pad’s Enter also works.)
5. Type “**Total**” in cell **A5** and click on cell **B3**.
6. Type “**500**” in cell **B3** and press **Enter** (can use the number pad.)
7. Type “**500**” in cell **B4** and press **Enter** (can use the number pad.)

Note that some wording “spills over” to an adjacent cell. as you type. The width of a column can be adjusted to accommodate the text in cells.

	A	B	C
1			
2			
3	Cash on Hand	500	
4	Paycheck	500	
5	Total		
6			
7			
8			
9			

**NOTE:** By default **text** is **left aligned**, and **numbers** are **right aligned**.

## Using Shortcuts When Entering Data

1. When entering data across the columns, press the **right arrow key** instead of Enter to move to the next column. Use the **other arrow keys** to move in any other desired direction.
2. To accept the entry in a cell **without** moving the active cell, or “**cell designator**”, click the **green check mark** next to the **Edit Line** on the Formula Bar (it is active only as you enter data in the cell).



(X) is cancel, (✓) is enter/accept, and (fx) is edit formula.

3. Continue to enter the rest of the data, as shown below:

	A	B
7	Phone	80
8	Electric	75
9	Cable	25
10	Utilities Total	
11	Average Utility	
12		
13	Utilities Total	
14	Auto	250
15	Rent	350
16	Total	
17	Money Left	
18		

## Editing Text

### 1. Directly in the Cell

- a. Click on cell **C2**, type your **first name**, and click the **green check mark** next to the Edit Line to accept the contents without moving to a new cell.

- b. Click on cell **D2**, type your **last name**, and press **Enter**.
- c. Select cell **D2** and press the **Delete key**, or **Edit > Undo** on the menu bar. (If you had not pressed Enter, the **Escape Key** would undo.)

The cell's contents are deleted and cleared to a blank cell.

- d. Select cell **C2** and begin typing your **campus phone number**. The new entry wipes out the old entry. Before you finish, click the **red "X"** next to the **Edit Line**. (*This does the same thing as the **Esc** key.*)

The cell's contents are returned to the previous entry.

- e. Delete cell **C2** by either pressing the **Backspace** or the **Delete** key.

## 2. Using the Edit Line

If a cell's contents are already mostly correct, it is not necessary to wipe out the entire cell and re-type the contents. You can use the **Edit Line** to make minor adjustments to cells.

- a. Select cell **A11** (Average Utility).
- b. In the **Edit Line**, click to the right of the "y" in "Utility", press **Backspace**, then type "ies" to make it read "Utilities".
- c. Press **Enter** (or the green check mark) to accept the change.

## *Widening Columns*

### 1. By Dragging

- a. Place the mouse pointer between the **column A** and **column B** headings at the top of the window.



The pointer changes to a **double-headed horizontal arrow**.

- b. **Click-and-drag** the column heading line until the width pop-up box above the pointer reads "**24.00**". This is the **number of characters** that can be contained in a column of that width. Release the mouse button to accept the width of 24.00.

## 2. By Using AutoFit

AutoFit is a feature that automatically sizes a column to fit the longest string of text in that column. To use AutoFit, simply **double-click** the line between column headings **after the cursor changes to the double-headed horizontal arrow**. There are two important notes about using AutoFit:

- a. AutoFit does not adjust columns if any additional text is typed into the column after you applied it. If additional text does not fit in the current column width, **you must AutoFit again** to adjust to the new text.
- b. Sometimes, you do not want to size a column according to the longest item in it. If AutoFit results in a column wider than you actually intended, **manually resize** the column to your own preference.

## *Inserting/Deleting Rows*

To properly space out the “**Money Left**” row from the others,

1. Click on cell **A17** (Money Left).
2. Choose **Insert > Rows** to insert a new blank row (17) above, and “Money Left” moves down to row 18.
3. **Delete** a row, column or cell by selecting it and choosing **Edit > Delete**.

**NOTE:** Inserting Rows/Columns does not destroy any active formulas!

## *Renaming Worksheets*

### 1. By Right-Clicking

- a. **Right-click** the **Sheet1** sheet tab and choose **Rename**.

The current name is highlighted.

- b. Type “**Checkbook**” and press Enter to accept the new name.

### 2. By Double-Clicking

- a. **Double-click** the **Sheet2** sheet tab. *The name is now **highlighted**.*
- b. Type “**Grades**” and press **Enter**, and **Save** the workbook.

## Section 4 – Using Formulas and Functions

### What is a Formula?

A formula is a **calculated** (or “derived”) field used by Excel in the place of typed entries. To see the reasons for using formulas, try to complete the checkbook in the following manner:

1. Click on cell **B5**. Add the figures together in cells **B3** and **B4**, then type the result (**1000**) in cell **B5**.
2. Oops! The “**Cash on Hand**” figure should actually be **400**, not **500** as currently shown. Change the amount in cell **B3** to “**400**”.
3. Note that the figure in cell **B5** does not change, even though it is now incorrect. To correct this cell, you would have to manually change it as well. Other changes would have to be made throughout the spreadsheet, such as to cell **B18** (Money Left), when completed.
4. **Delete** the entry in cell **B5**. Change the amount in cell **B3** to “**500**”.

### Entering a Formula

What you actually intend in cell B5 is to add together the amounts in cells B3 and B4 and display the result, **while allowing for future changes**. This process is called using a **cell reference** to prepare a **formula**. A cell reference can refer to one or more cells.

**IMPORTANT:** You must enter an **equal sign (=)** to begin a formula. You must follow the rules of the “**order of operations**” when writing formula:

**“(3 + 1)/2” is not the same as “3 + 1 / 2”**

1. In cell **B5**, type “**=B3+B4**” and press **Enter**. (You do not have to type capital letters; Excel will automatically convert cell references for you.)

The resulting calculation of 1000 displays in the cell.

2. Click back on cell **B5** and view the contents of the **Edit Line**. The formula, not the number “1000”, is shown.

The screenshot shows an Excel spreadsheet with a formula bar at the top containing the formula  $=B3+B4$ . Below the formula bar, the spreadsheet grid is visible. Cell B3 contains the value 500, and cell B4 contains the value 500. Cell B5, which is selected, contains the result 1000. The formula bar also shows the result 1000.

Formula Bar	
fx =B3+B4	
	B
	500
	500
	1000

3. Click on cell **B3** and type “**600**”.

Cell B5 automatically updates to 1100.

Q: Why didn't we use the formula "**=500+500**"?

## Typing a Cell Range

A **range** is a group of two or more adjacent cells. Ranges are entered in this way: "B7:B9". The colon is a mathematical substitute for the word "**through**" in a formula. Ranges are often used in coordination with functions (sum, average, count, etc.).

1. Click on cell **B10**.
2. Type "**=SUM(B7:B9)**" and press **Enter**.

The formula value of 180 displays in cell B10.


3. **Delete** the contents of cell **B10** to prepare for the **AutoSum** feature.

## Using AutoSum

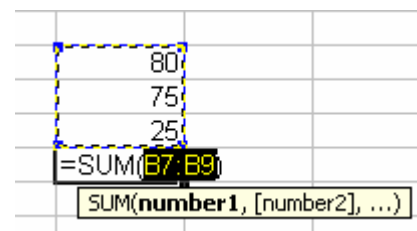
AutoSum automatically calculates the totals of cells, without using the keyboard, based on certain rules:

- ◆ AutoSum will add figures to the **left of the active cell** until it hits a blank column, or
- ◆ If no figures are to the left, AutoSum will add figures **above the active cell** until it hits a blank row.

1. From cell **B10**, click the **AutoSum** button

 on the Standard Toolbar.

The range B7:B9 is selected and displays in a flashing dashed line, known as the "line of marching ants."



This **selection can be pulled up or down** to include or exclude cells, thus creating a new selection of cells.

2. Click the **AutoSum** button again (or **Enter**, or **✓**) to accept.

The same formula you typed in: "**=SUM(B7:B9)**" is automatically entered in the **Edit Line**.

## ***Creating a Simple Cell Reference***

A **simple cell reference** refers to **just one cell**. In this case, we want to have cell B13 reflect the total shown in cell B10. However, since B10 may change, we will **not type the resulting number** (180) into cell B13. Instead, we will use a simple reference.

1. Click on cell **B13**.
2. Type “=**B10**” and press **Enter**.

The result of 180 displays in cell B13.

## ***Creating an Absolute Formula Reference (Paste Special)***

We want to have cell **D10** reflect the total shown in cell B10. However, since B10 may change, we will **not type the resulting number** (180) into cell. **We also don't want to cut and paste** the cell, because Excel automatically adjusts the references in the pasted formula to refer to different cells relative to the position of the formula.

1. Copy cell **B10**. (**Ctrl +C**).
2. Click on cell **D10** and go to **Edit > Paste Special** and click the button to **Paste Link**.

The result of 180 displays in cell D10, and the edit bar will show **=\$B\$10**. The column and/or row reference is **absolute**. Normally, references automatically adjust when you copy them, but absolute references don't.

## ***Completing the Checkbook Entries***

1. Click on cell **B16**, and use the **AutoSum** button to sum cells B13:B15 (should be 780).
2. Click on cell **B18**, and type an “=” to begin a formula.
3. Instead of typing, click cell **B5** to select it (placing it in the **Formula Bar**).
4. Type a minus sign (-), then click on cell **B16** and press **Enter**.

The completed checkbook shows **Money Left** of **320**.

5. Change cell **B3** to “**500**”.  
The completed checkbook **updates Money Left** of 220.

## Using AutoCalculate

AutoCalculate is used to perform “**quick reference**” functions on selected cells, but without entering any formulas into the body of the spreadsheet. It is found in the **status bar**, and contains the **6 primary functions** used in Excel formulas:

**Sum:** adds the values for a total

**Average:** adds the values and divides by the number of items to obtain an average

**Max:** displays the maximum (largest) value in the selected cells

**Min:** displays the minimum (smallest) value in the selected cells

**Count:** displays the total number of cells with active data

**Count Nums:** displays the total number of non-text active data

1. **Drag-select** cells **B7:B9** and view the result in the **AutoCalculate area** (right side of the Status Bar at the bottom of the screen). The area currently shows “**Sum=180**”.

80
75
25
180

2. **Right-click** the **AutoCalculate area** and choose “**Average**”.

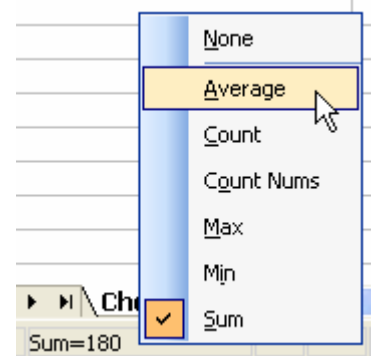
The area shows, “Average=60”.

3. **Right-click** the area again and choose “**Min**”.

The area shows, “Min=25”.

4. **Right-click** the area again and choose “**Max**”.

The area shows, “Max=80”.



5. **Drag-select** cells **A7:B9**.

6. **Right-click** the **AutoCalculate area** and choose “**Count**”.


The area shows “Count=6” (because six cells are selected, and all have some data in them).

7. **Right-click** the area again and choose “**Count Nums**”.

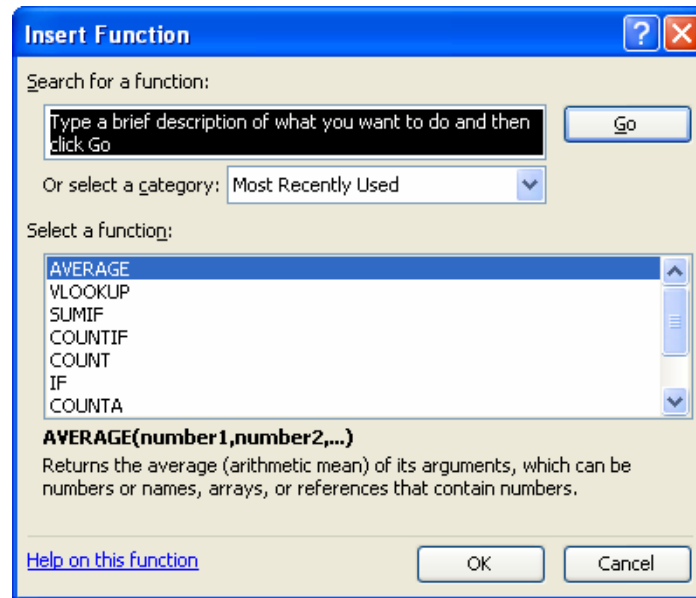
The area shows “Count Nums=3” (because only three cells selected have numbers in them).

## Using Insert Function

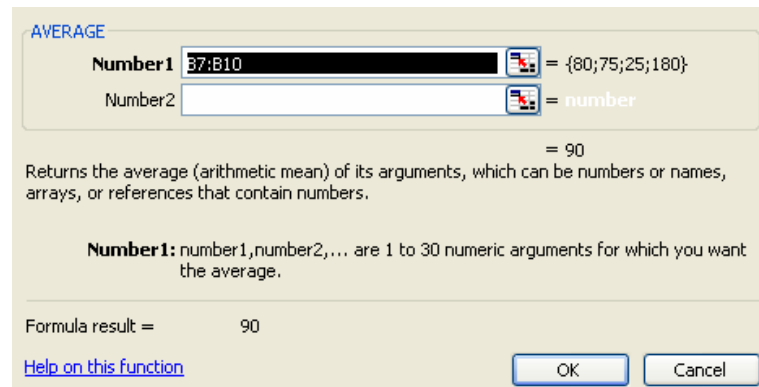
The **Insert Function** feature is used to get step-by-step help with choosing a function and creating a formula.

1. Click on cell **B11**, and then click the **Insert Function** button  on the Standard Toolbar.

The Paste Function dialog box displays.



2. Note the **Function Categories** in the 'select a category:' pull down menu. Below are displayed the functions associated with the selected category. The "**Most Recently Used**" category always displays first.
3. Select "**Average**" from the 'select a function:' list and click **OK**.



The **Average** Function Arguments Palette displays, showing the range B7:B10 in its *proposed* formula. Because **we do not want to include cell B10** in the average, we must **re-select the range** of cells to be averaged.

4. Click the **Collapse button**  on the Function Palette.

The palette collapses to allow for better viewing of the cells on the sheet. If necessary, move the palette bar so you can view all desired cells.

5. **Drag-select** cells **B7:B9** (the “line of marching ants” should go around those cells).

6. Click the **Expand button** .

The Function Palette displays again in full. The correct range of cells is now shown in the formula.

7. Click **OK** to accept the formula.


The Formula Palette collapses into the Edit Line, and the results of the formula (60) are shown in cell B11.

8. **Save** the file.

## Section 5: Database Functions - Sorting and Filtering Data

### *Copying Data with AutoFill*


AutoFill is a feature in Excel that allows cell contents to be **copied and updated quickly** without using the copy and paste buttons.

1. Click on the “**Grades**” sheet tab, and select cell **F4**. With the cell selected, place the mouse pointer at the bottom right corner of the cell until the **thin plus sign**, called the **AutoFill pointer** () displays.
2. **Click-and-drag** the pointer down from cell **F4 to F50**.

The formula in cell F4 is copied and automatically updated to reflect the changes needed to the formula in each new cell.

3. **Save** the file.

## Sorting Lists

1. Select cell **A3** (last name). Note that the records are currently in alphabetical order.
2. Click on cell **C3** (prelim grade), then click the **Sort Ascending button**  on the Standard Toolbar.

The records are sorted in numerical order by preliminary test score.

3. Click the **Sort Descending button** .

The records are sorted in reverse order.

4. Click on cell **F3** (overall grade), and **sort in descending order**.

The records are sorted by highest to lowest Overall Grade.

### NOTE:

Sort assumes that if the top cell in the column is text, that it is **simply a label that should not be sorted**. If there is no text label, it sorts all data.

### IMPORTANT WARNING:

**DO NOT** perform a sort on any table that has **BLANK ROWS OR COLUMNS** (with no headings) The **empty rows/columns break-up the table** into "sub-tables," and sorting only shifts cells in one sub-table, making that chunk of information out-of whack with the rest of the table!

## Filtering Data with AutoFilter

“Filtering” is the process of removing those records you do not want to see and **displaying only those records that match certain criteria**. To allow quick filtering, Excel uses a feature called “**AutoFilter**” for the field.

1. Select cell **A3** (last name).
2. Choose **Data > Filter > AutoFilter**.

Excel adds AutoFilter buttons (down arrows) on each field heading.

3. Click the **AutoFilter button** for the “**Prelim**” field.

A drop-down list of entries displays.

4. Select “85” from the list.

A list of students who made 85 on the preliminary exam displays (4 students).

3	Last Na	First Na	Prelim	Mid-Ter	Final	Overall Grade
7	Corley	Charlotte	85	98	98	94.75
21	Hernandez	Maggie	85	83	93	88
35	Fisher	Cheryl	85	73	86	81.85
36	Mullins	Lois	85	85	78	81.85

Note that the Plain AutoFilter button has turned **blue**, indicating that it is currently in effect; also, the **row headings** have turned blue, indicating that these rows match filter criteria. Rows that do not match have been skipped.

### ***To get all of your Autofiltered records to show again:***

1. **Scroll** to the top of the list.
2. Click the **Prelim AutoFilter button**, and select “**(All)**” from the list.

The list returns to showing all customers, and the blue filter indicators turn off.

## Applying a Custom AutoFilter

1. Click the **Overall Grade AutoFilter** button in cell **F3**.
2. Select "**(Custom...)**" from the list.

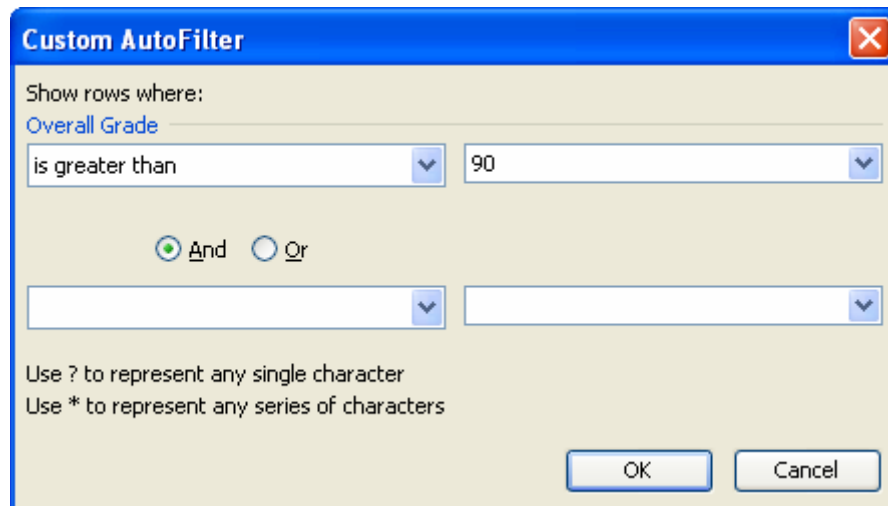
The Custom AutoFilter dialog box displays.

3. Click the **down arrow** in the "**Overall Grade**" area (currently reads, "**equals**").

A drop-down list of comparison operators displays.

4. Select "**is greater than**" from the list.
5. Click in the blank field to the right of "is greater than".
6. Type "**90**".

Enters 90 as the minimum criterion to be filtered.



7. Click **OK**.

The dialog box closes and applies the custom filter (13 records). Note that it is easier to use the AutoCalculate area to determine the total records than to manually count them on your screen!

8. Click on cell **F3**, then click the **Sort Ascending (A-Z) button**.

The records are sorted by the lowest "A" score to the highest, with only grades better than "90" showing.

## Turning Off AutoFilter

1. Choose **Data > Filter**, and click the **AutoFilter** option, which is currently checked.

The AutoFilter is deselected from the list.

2. Click on cell **A3**, then **sort in ascending order**.

Sorts in alphabetical order.

3. **Save** the workbook.

## Adding Data

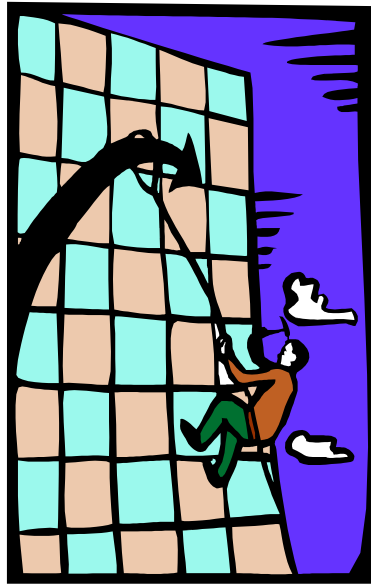
1. **Sort** the data in **descending order** of **overall grade**.
2. In **column G**, assign a grade of **"A"** to the first person on the list. **Bold** and **Center** the letter A. Use **Autofill** to assign this formatted letter grade to anyone else with a score of **90** or above.
3. Repeat for **"B"** and **"C"** students.
4. Create separate cells in **I4:I6** for **"A"**, **"B"**, and **"C"**.

Enter the totals for each group in **J4:J6**.

	F	G	H	I	J	K
Overall Grade						
99.5		<b>A</b>		<b>A</b>	13	
97.75		<b>A</b>		<b>B</b>	26	
96.5		<b>A</b>		<b>C</b>	8	
94.75		<b>A</b>				
94		<b>A</b>				
93.75		<b>A</b>				
92.15		<b>A</b>				

# Excel 2003

## Introduction



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