

**COSC 122**  
***Computer Fluency***

***Spreadsheets***

**Dr. Ramon Lawrence**  
**University of British Columbia Okanagan**  
**[ramon.lawrence@ubc.ca](mailto:ramon.lawrence@ubc.ca)**

# *Key Points*

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- 1) Spreadsheets are programs for storing and manipulating data that is represented as a table of cells.
- 2) Each cell has a row number and column label which combine to represent its address.
- 3) Spreadsheets allow you to organize data and write formulas to do computations. They are a powerful tool for data storage and analysis.

# Spreadsheet Overview

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A **spreadsheet** organizes information into a two-dimensional array of cells (a **table**).

A **cell** has two components:

- ◆ an address - specified given a row and column number
- ◆ a location - that can store a number, text, or formula

The power of a spreadsheet is that we can write simple formulas (commands) to perform calculations and immediately see the results of those calculations.

Spreadsheets are very common in accounting and reporting applications.

# Spreadsheet Addressing

A **cell** is identified by a row number and column letter.

The screenshot shows the Microsoft Excel interface with the following data:

	A	B	C	D	E	F	G	H
1		<b>Activity List</b>						
2	<u>Date</u>	<u>Description</u>	<u>Hours</u>	<u>Rate</u>	<u>Total</u>			
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00			
4	2-May	Design program	5	\$ 80.00	\$ 400.00			
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00			
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00			
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00			
10								
11		<b>Total:</b>			<b>\$2,155.00</b>			
12								

ROWS

formula in cell

columns

cell at E11

# Spreadsheet Addressing

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The rows in a spreadsheet are numbered starting from 1.

The columns are represented by letters.

- ◆ A is column 1, B is column 2, ..., Z is column 26, AA is column 27, ...

A cell is identified by putting the column letter first then the row number.

- ◆ e.g. B3 is the 2nd column and the 3rd row.

Question: What column number is AD? How about BAD?

# Spreadsheet Data Entry

An entry can be added to a cell by clicking on it and typing in the data. The data may be a number, text, or a date.

- ◆ The spreadsheet attempts to detect the data type and format it accordingly. It is also possible to manually format the data.

format  
option

Activity.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Accounting

Accounting Number Format

Choose an alternate currency format for the selected cell.

For instance, choose Euros instead of Dollars.

	A	B	C		
1		<b>Activity List</b>			
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>		
3	1-May	Meet with client	8	\$	
4	2-May	Design program	5	\$ 80.00	\$ 400.00
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00
10					
11		<b>Total:</b>			<b>\$2,155.00</b>
12					

Ready | Main | Copy Cells | ConditionalFormat | Chart | 100%

# Spreadsheet Formatting

We can format cells in italics, underline, and bold similar to a text editor. It is also possible to justify data and change fonts.

**format and justify shortcuts**

The screenshot shows the Microsoft Excel interface with the Home ribbon selected. A red circle highlights the Bold (B), Italic (I), and Underline (U) buttons in the Font group. The spreadsheet below shows an 'Activity List' table with a total value of \$2,155.00 in cell E11.

	A	B	C	D	E	F	G	H
1		<b>Activity List</b>						
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>			
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00			
4	2-May	Design program	5	\$ 80.00	\$ 400.00			
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00			
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00			
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00			
10								
11		<b>Total:</b>			<b>\$2,155.00</b>			
12								

# Spreadsheet Selecting Cells

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Multiple ways of selecting cells:

- ◆ 1) With the mouse, (left) click and drag mouse to select a rectangle region of cells.
- ◆ 2) With keyboard, hold **SHIFT** key and use arrow keys to select a rectangle region of cells.
- ◆ 3) With mouse and keyboard, while holding **CTRL** key, (left) click on individual cells to select non-contiguous cells.
- ◆ 4) Click on a row number to select a whole row.
- ◆ 5) Click on a column header to select a whole column.



# Range Selecting Cells Example

The screenshot shows the Microsoft Excel interface with the 'Home' tab selected. The active cell is B3, containing the text 'Meet with client'. A range of cells from B3 to E6 is selected, highlighted in orange. The spreadsheet contains the following data:

	A	B	C	D	E	F	G	H	
1		<b>Activity List</b>							
2	<u>Date</u>	<u>Description</u>	<u>Hours</u>	<u>Rate</u>	<u>Total</u>				
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00				
4	2-May	Design program	5	\$ 80.00	\$ 400.00				
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00				
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00				
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00				
10									
11		<b>Total:</b>			<b>\$2,155.00</b>				
12									

The status bar at the bottom shows: Ready, Average: 146.75, Count: 16, Sum: 1761, 100% zoom.

# Selecting Individual Cells Example

The screenshot shows Microsoft Excel in Compatibility Mode with the file 'Activity.xls'. The ribbon includes Home, Insert, Page Layout, Formulas, Data, Review, and View. The formula bar displays the formula `=SUM(E3,E5,E7,E9)`. The spreadsheet contains the following data:

	A	B	C	D	E	F	G	H	
1		<b>Activity List</b>							
2	<u>Date</u>	<u>Description</u>	<u>Hours</u>	<u>Rate</u>	<u>Total</u>				
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00				
4	2-May	Design program	5	\$ 80.00	\$ 400.00				
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00				
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00				
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00				
10									
11		<b>Total:</b>			<b>\$ 2,155.00</b>				
12					<code>=SUM(E3,E5,E7,E9)</code>				

The status bar at the bottom shows 'Point' and a zoom level of 100%.

# Manipulating Cells

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Once you have selected one or more cells, there are several common actions you can perform:

## ◆ 1) DELETE

- ⇒ delete the contents of all cells by pressing delete key
- ⇒ delete the contents and the cell locations (then shift remaining) by selecting Edit menu, Delete... or Delete... from pop-up menu (brought up by right click).

## ◆ 2) Cut, Copy, Paste

- ⇒ cut - copies selected cells to clipboard and removes from document
- ⇒ copy - copies selected cells to clipboard
- ⇒ paste - copies cells in clipboard to sheet starting at currently selected cell

## ◆ 3) Add selected cells to a formula (requires that you were previously constructing a formula before selecting the cells).

# *Manipulating Cells - Filling*

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**Filling** combines copy and paste.

There is a small box or tab beyond the cell's lower right corner (fill handle). Grab it with the cursor and pull to other cells.

# Cut, Copy, Paste

cut,  
copy,  
paste

The screenshot shows the Microsoft Excel interface with the following data in the spreadsheet:

	A	B	C	D	E	F	G	H
1		<b>Activity List</b>						
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>			
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00			
4	2-May	Design program	5	\$ 80.00	\$ 400.00			
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00			
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00			
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00			
10								
11		<b>Total:</b>			<b>\$2,155.00</b>			
12								

The formula bar shows the formula for cell E11: `=SUM(E3:E9)`. The status bar at the bottom indicates 'Ready' and '100%' zoom.

# Hiding Columns and Rows

You can **hide** a column or row by right-clicking on the column or row header and selecting **Hide**. The column/row still exists but will not be displayed or printed unless unhidden.

The screenshot shows Microsoft Excel in Compatibility Mode with the file 'Activity.xls'. The spreadsheet contains a table with columns A through H and rows 3 through 15. Column D is selected, and a context menu is open over it. The menu options are: Cut, Copy, Paste, Paste Special..., Insert, Delete, Clear Contents, Format Cells..., Column Width..., Hide, and Unhide. The spreadsheet data is as follows:

	A	B	C	D	E	F	G	H
3	1-May	Meet with client	8	\$ 50	\$ 100.00			
4	2-May	Design program	5	\$ 80	\$ 400.00			
5	3-May	Write initial prototype	9	\$ 40	\$ 360.00			
6	4-May	Write initial prototype	9	\$ 40	\$ 360.00			
7	5-May	Test prototype	6	\$ 50	\$ 300.00			
8	6-May	Deploy program	5	\$ 25	\$ 125.00			
9	7-May	System-wide testing	6	\$ 35	\$ 210.00			
10								
11		Total:			\$ 2,155.00			
12								
13								
14								
15								

# Entering Formulas

A **formula** is any expression that begins with an equal sign ("=").

The equal sign indicates to the spreadsheet that a calculation must be performed to compute the value of the cell.

The screenshot shows the Microsoft Excel interface with the following data in the spreadsheet:

	A	B	C	D	E	F	G	H	
1		<b>Activity List</b>							
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>				
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00				
4	2-May	Design program	5	\$ 80.00	\$ 400.00				
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00				
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00				
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00				
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00				
10									
11		<b>Total:</b>			<b>\$2,155.00</b>				
12									

# Formula Expressions

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A **formula** expression can consist of literals (numbers, text strings), operators, functions, and cell references.

Simple mathematical expressions:

◆ = 1 + 5

◆ = 1.5 \* 3.14 + 42

Common functions:

◆ = ROUND(PI, 2) // Result is 3.14

◆ = CONCATENATE("Hello", " World") // Hello World

◆ Other common functions for trigonometry, dates, and financial.



# Formula Expressions

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The power of formulas comes from using cell references (similar to variable names in programming).

Cell reference examples:

$$\blacklozenge = A1 + A2$$

$$\blacklozenge = B1 + A3 - A4$$

# Spreadsheets

## Selecting Cells

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**Question:** Which method allows you to select non-contiguous cells in a spreadsheet?

- A)** hold `SHIFT` key and use arrow keys
- B)** With the mouse left click on a cell and drag mouse
- C)** hold `CTRL` key and use arrow keys
- D)** hold `CTRL` key and left click on cells

# Spreadsheets

## Formulas

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**Question:** A cell contains the following:  $=3+5*2$  What is the value of the cell?

**A)** 13

**B)** 16

**C)**  $=3+5*2$

# Spreadsheets

## Formulas

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**Question:** A cell contains the following: **'ABC'+'DEF'** What is the value of the cell?

- A)** error
- B)** ABCDEF
- C)** 'ABC'+'DEF'



# Advanced Spreadsheet Addressing

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The dollar sign "\$" is a special symbol that indicates an absolute address.

- ◆ By default, addresses are "relative" in the sense that if they are in a formula that is copied to another cell, they will be changed relative to where they were copied from their origin.

Example:

- ◆ Cell A1 has the formula  $=A2+B1$
- ◆ Copy contents of cell A1 to cell C4.
- ◆ Formula changes to  $=C5+D4$  because moved down three rows and over two columns.
- ◆ If cell A1 had the formula  $=\$A\$2+\$B\$1$ , then the same formula would be in cell C4.
- ◆ Question: What if formula was  $=\$A2+B\$1$ ?

# Spreadsheets

## Formulas and References

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**Question:** Cell **A1** contains the following: **=\$B2+D\$4** What is the formula if the cell is copied to cell **D3**?

- A)** error
- B)** =\$B2+D\$4
- C)** =\$B4+F\$4
- D)** =\$B4+G\$4

# Naming Cells

Instead of referring to cells by their address, you can give a cell a name and use that name in cell formulas.

◆ This makes it easier to read and understand formulas.

⇒ Like programming variables where we use names instead of addresses to refer to data locations.

Example: Refer to columns by name Hours and Rate.

name box      named cells

use names in formula

The screenshot shows the Excel interface with the 'name box' (top left) displaying 'Hours' and the formula bar (top center) displaying '8'. The spreadsheet below has columns named 'Date', 'Description', 'Hours', 'Rate', and 'Total'. The 'Hours' column is highlighted in orange, and the value '8' in cell C3 is highlighted in green.

	A	B	C	D	E	F
1		<b>Activity List</b>				
2	Date	Description	Hours	Rate	Total	
3	01-May	Meet with client	8	\$ 50.00	\$ 400.00	
4	02-May	Design program	5	\$ 80.00	\$ 400.00	
5	03-May	Write initial prototype	9	\$ 40.00	\$ 360.00	
6	04-May	Write initial prototype	9	\$ 40.00	\$ 360.00	
7	05-May	Test prototype	6	\$ 50.00	\$ 300.00	
8	06-May	Deploy program	5	\$ 25.00	\$ 125.00	
9	07-May	System-wide testing	6	\$ 35.00	\$ 210.00	
10						
11		Total:			\$2,155.00	
12						

The screenshot shows the Excel interface with the 'name box' (top left) displaying 'E3' and the formula bar (top center) displaying '=Hours\*rate'. The spreadsheet below is identical to the previous one, but the 'Rate' column is highlighted in orange, and the value '\$ 80.00' in cell D4 is highlighted in green.

	A	B	C	D	E	F
1		<b>Activity List</b>				
2	Date	Description	Hours	Rate	Total	
3	01-May	Meet with client	8	\$ 50.00	\$ 400.00	
4	02-May	Design program	5	\$ 80.00	\$ 400.00	
5	03-May	Write initial prototype	9	\$ 40.00	\$ 360.00	
6	04-May	Write initial prototype	9	\$ 40.00	\$ 360.00	
7	05-May	Test prototype	6	\$ 50.00	\$ 300.00	
8	06-May	Deploy program	5	\$ 25.00	\$ 125.00	
9	07-May	System-wide testing	6	\$ 35.00	\$ 210.00	
10						
11		Total:			\$2,155.00	
12						

# Aggregate Formulas

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An **aggregate formula** computes a summary function over a range of cells. The values can either be literals or cell locations.

Common functions are:

- ◆ `MIN(<value list>)` - returns minimum value in list
- ◆ `MAX(<value list>)` - returns maximum value in list
- ◆ `SUM(<value list>)` - returns sum of all values in list
- ◆ `AVERAGE(<value list>)` - returns average of values in list
- ◆ `COUNT(<value list>)` - returns count of values in list
- ◆ `MEDIAN(<value list>)` - returns median value of list

If specifying a cell rectangle, give the upper left and lower right corners, separated by a colon.

- ◆ e.g. `=average(A3:E6)` - rectangle of 4 rows and 5 columns



# Aggregate Formula Example

building formula  
by selection

The screenshot shows Microsoft Excel in Compatibility Mode with the file 'Activity.xls'. The ribbon includes Home, Insert, Page Layout, Formulas, Data, Review, and View. The formula bar shows '=max(C3:C9'. The active cell is C11, and the formula bar also displays '=max(C3:C9'. A tooltip for the MAX function is visible: 'MAX(number1, [number2], ...)'. The 'Activity List' table is as follows:

	A	B	C	D	E	F	G	H
1		<b>Activity List</b>						
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>			
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00			
4	2-May	Design program	5	\$ 80.00	\$ 400.00			
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00			
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00			
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00			
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00			
10								
11		<b>Total:</b>	=max(C3:C9)		<b>\$ 2,155.00</b>			
12								

# Sorting Data

Activity.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas **Data** Review View

Get External Data Refresh All Edit Links Connections Sort Filter Clear Reapply Advanced Text to Columns Remove Duplicates Outline

A3 5/1/2006

Activity List				
Date	Description	Hours	Rate	Total
1-May	Meet with client	8	\$ 50.00	\$ 400.00
2-May	Design program	5	\$ 80.00	\$ 400.00
3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
5-May	Test prototype	6	\$ 50.00	\$ 300.00
6-May	Deploy program	5	\$ 25.00	\$ 125.00
7-May	System-wide testing	6	\$ 35.00	\$ 210.00

**Sort**

Add Level Delete Level Copy Level Options... My data has headers

Column	Sort On	Order
Sort by Hours	Values	Smallest to Largest
Then by Rate	Values	Smallest to Largest

OK Cancel

Data can be sorted by selecting the **Sort** option under the **Data** menu.

Select the column(s) to sort on.

# Spreadsheets

## Aggregate Formulas

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**Question:** Assume the three cells in the range A1:C1 contain numbers. Which of these formulas is **ALWAYS** the largest?

**A)** MAX(A1:C1)

**B)** MIN(A1:C1)

**C)** COUNT(A1:C1)

**D)** SUM(A1:C1)

**E)** none of the above are always guaranteed to be the largest

# Charts

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A **chart** is a graphical representation of spreadsheet data.

A chart is of a particular type (line, bar, etc.) and requires the user to supply the data that will be displayed in the chart.

# Chart: Step #1 - Select Data and Type

Select **Insert**, then click **Chart** Icon, and pick the chart type.

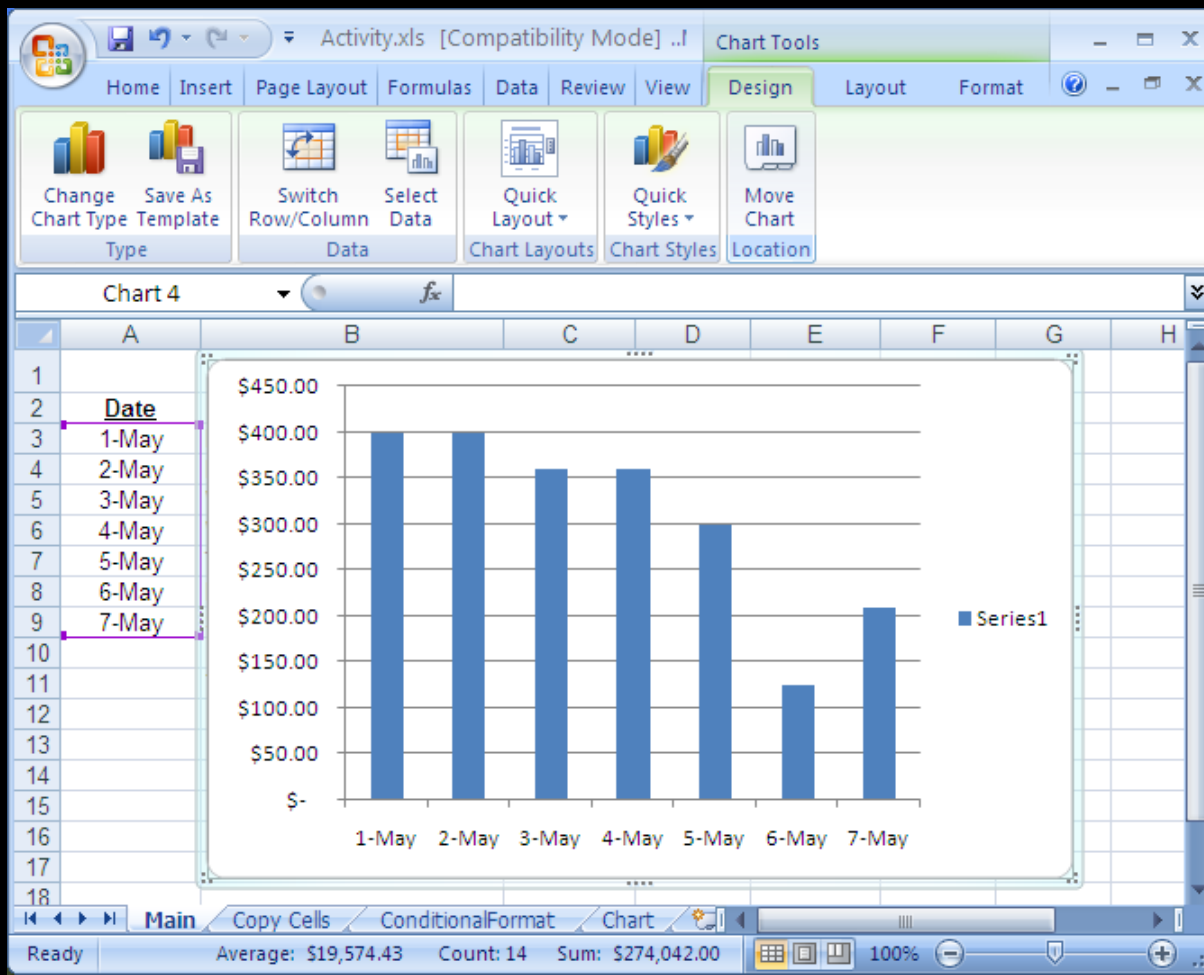
chart shortcut

The screenshot shows the Microsoft Excel interface with the 'Insert' tab selected in the ribbon. The 'Chart' icon is highlighted, and the 'Insert Chart' dialog box is open. The dialog box shows various chart types, with 'Column' selected and 'Clustered Column' highlighted. The background spreadsheet contains the following data:

Activity List				
Date	Description	Hours	Rate	Total
1-May	Meet with client	8	\$ 50.00	\$ 400.00
2-May	Design program	5	\$ 80.00	\$ 400.00
3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
5-May	Test prototype	6	\$ 50.00	\$ 300.00
6-May	Deploy program	5	\$ 25.00	\$ 125.00
7-May	System-wide testing	6	\$ 35.00	\$ 210.00
Total:				\$2,155.00

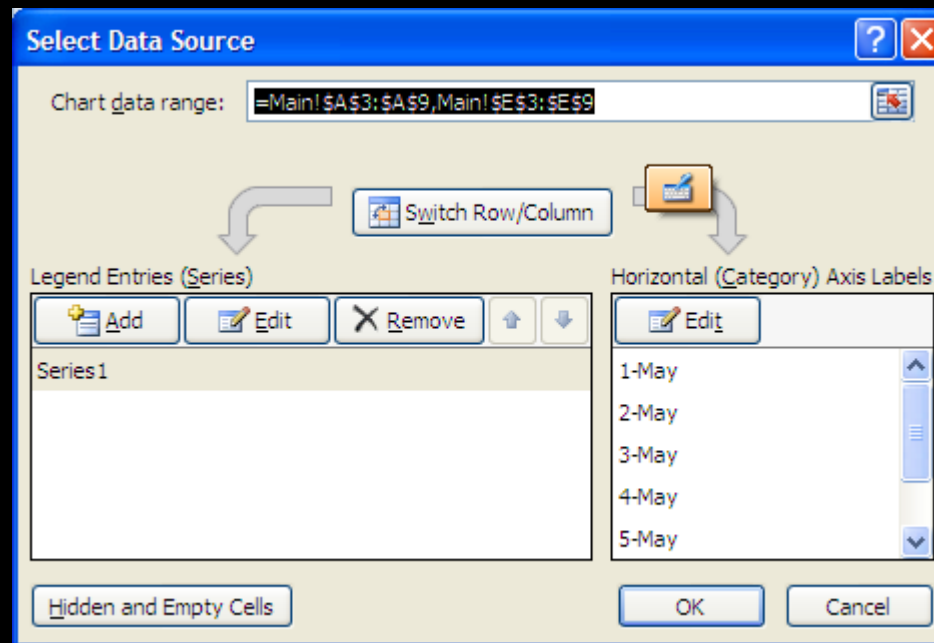
# Chart Options

Chart design tools allows you to modify the data in the chart, change the chart type, and move the chart in the Worksheet.



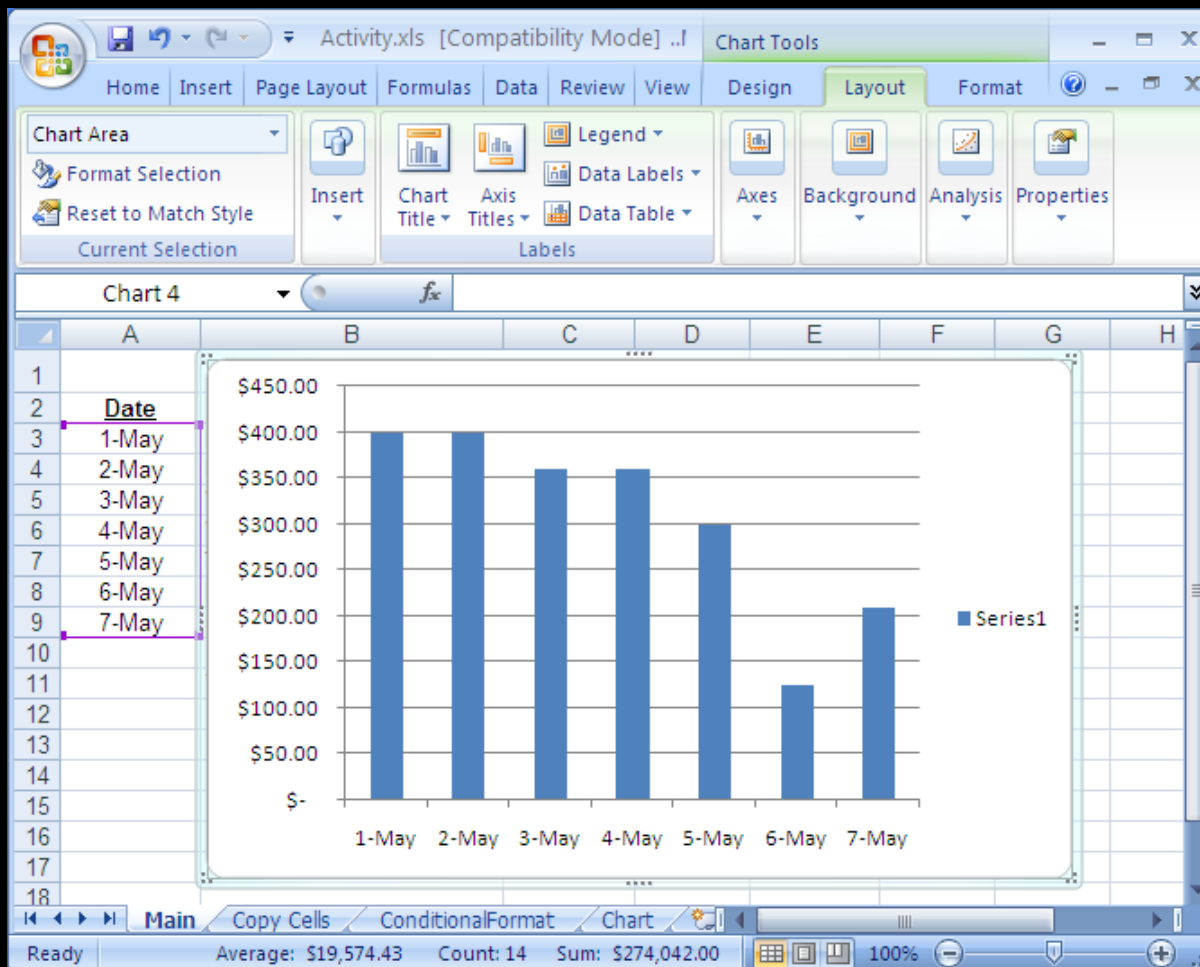
# Chart: Step #2 - Verify Data

You may modify the data displayed in the chart using the Select Data option. This includes adding legends.



# Chart: Step #3 - Chart Options

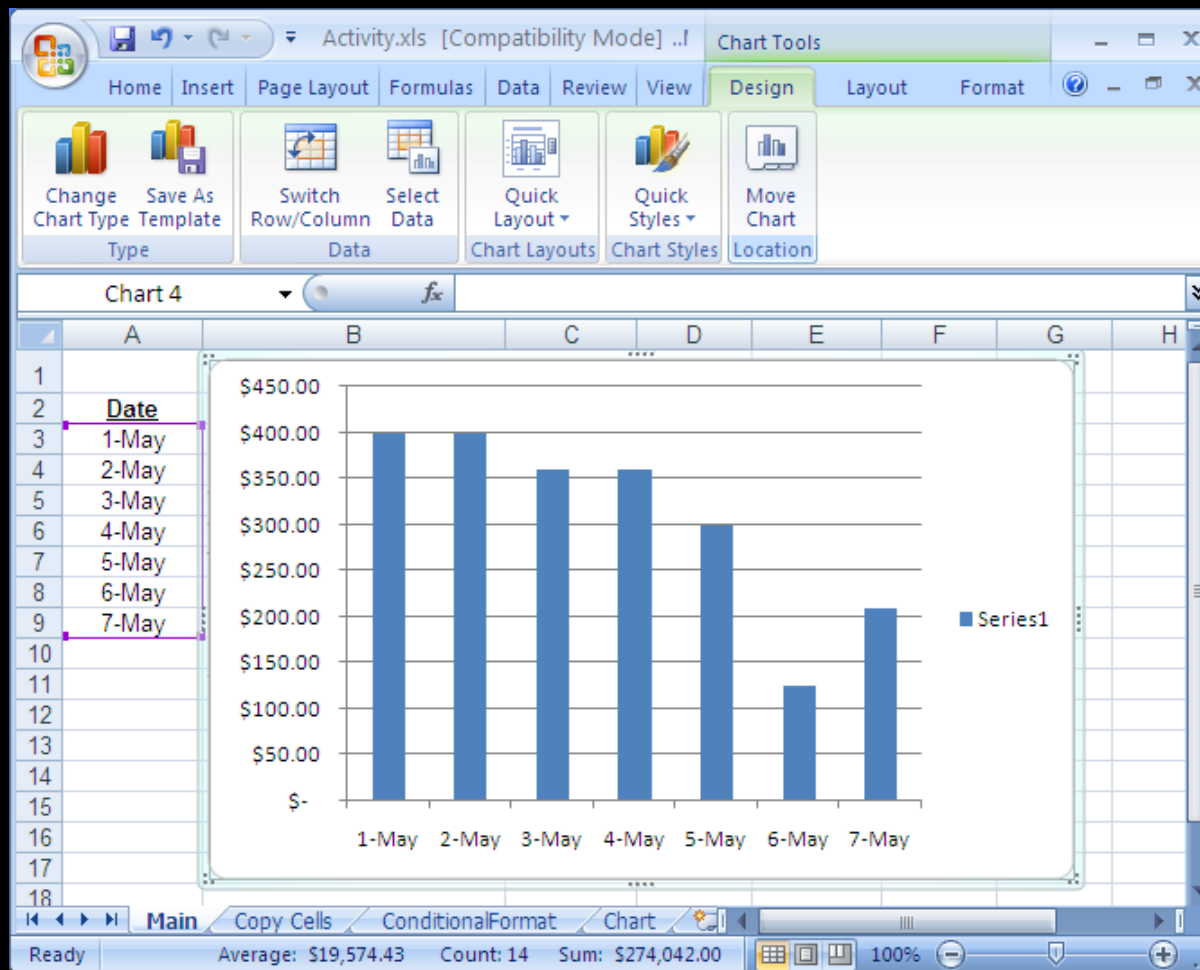
Under **Layout (Chart Tools)** you can set the title, legend, and colors. There are more format options under **Format**.



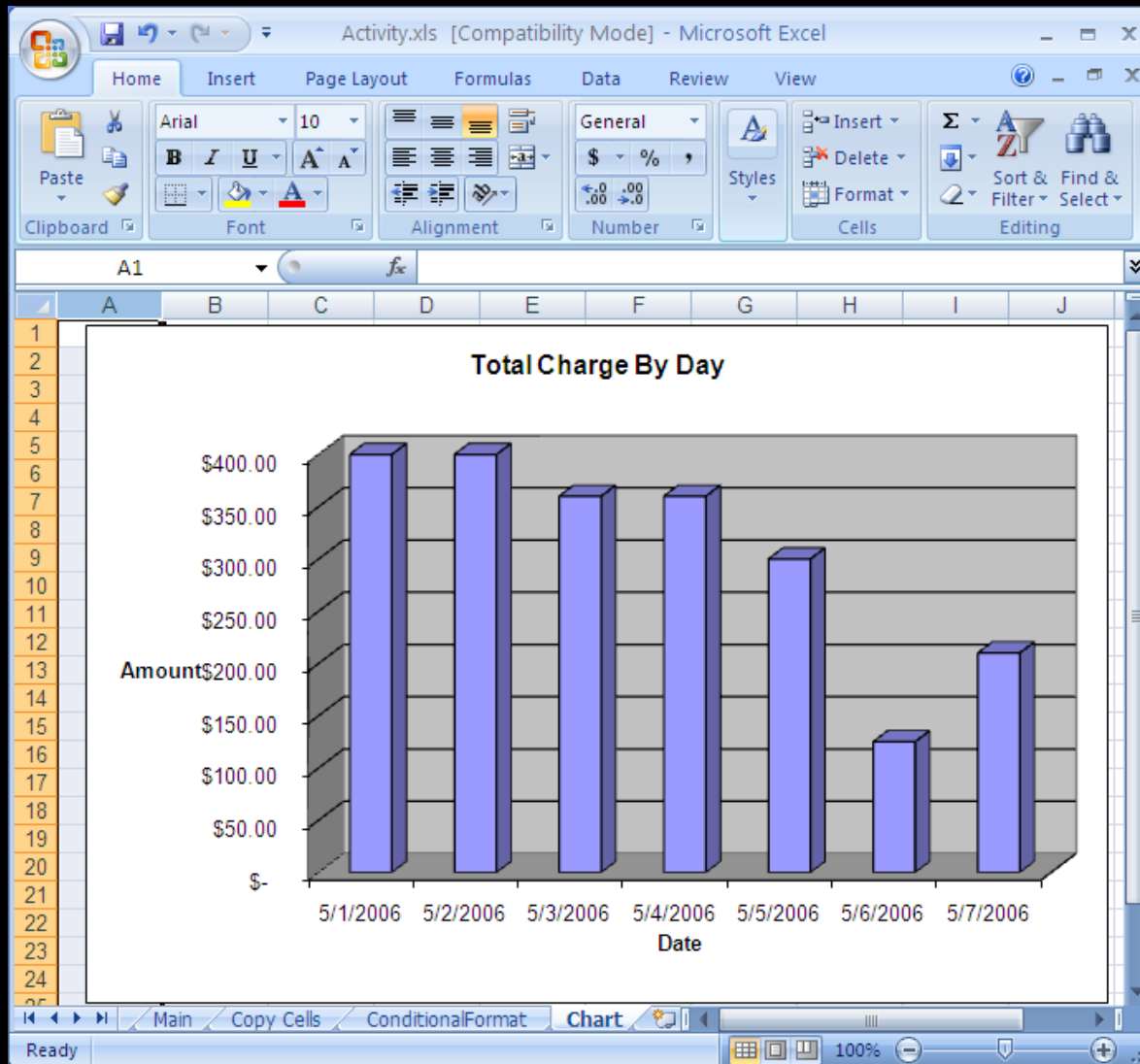


# Chart: Step #4 - Chart Location

Put chart on an existing sheet or on its own sheet by selecting **Move Chart** in the **Design** area.



# Final Chart



# Other Formatting: Column Width

The screenshot shows the Microsoft Excel interface with the 'Activity List' spreadsheet. The 'Format' menu is open, and the 'Column Width' option is highlighted. The spreadsheet data is as follows:

	A	B	C	D	E
1		<b>Activity List</b>			
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00
4	2-May	Design program	5	\$ 80.00	\$ 400.00
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00
10					
11		<b>Total:</b>			<b>\$2,155.00</b>
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Resizing columns:

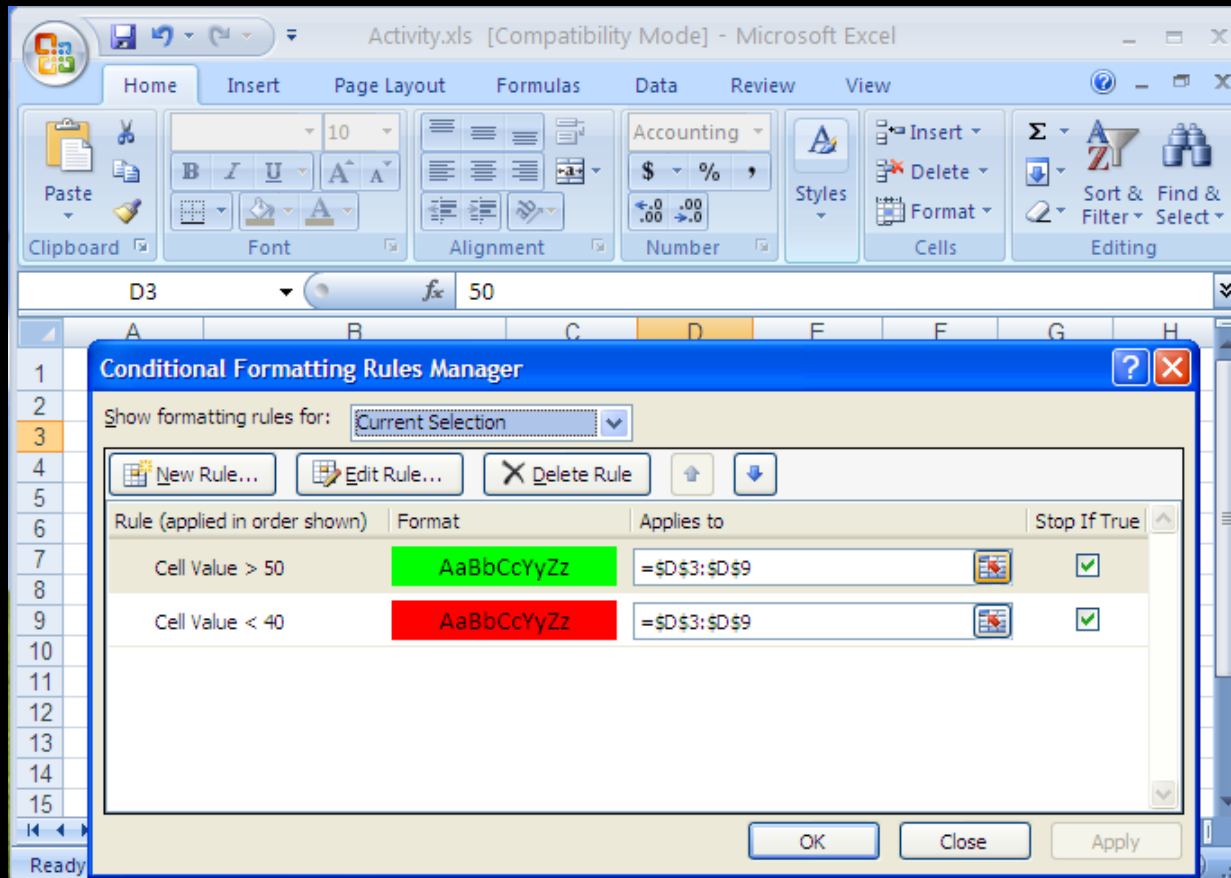
Auto-resize by double clicking on border between columns or using the **Format** option.

May also right-click on column to get **Format** option in the pop-up menu.

# Conditional Formatting

**Conditional formatting** allows you to change the cell format based on data values. This is accessible under **Styles**.

◆ Other options: data bars, color scales



# Conditional Formatting Result

The paint format button allows you to copy formatting to many cells. Select the cell, click paint button, then highlight cells to have identical formatting.

paint  
formatting  
button

The screenshot shows the Microsoft Excel interface with the 'Activity List' table. The 'Rate' column is highlighted with green and red colors. A green arrow points to the 'Paint Format' button in the ribbon.

Date	Description	Hours	Rate	Total
1-May	Meet with client	8	\$ 50.00	\$ 400.00
2-May	Design program	5	\$ 80.00	\$ 400.00
3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
5-May	Test prototype	6	\$ 50.00	\$ 300.00
6-May	Deploy program	5	\$ 25.00	\$ 125.00
7-May	System-wide testing	6	\$ 35.00	\$ 210.00
Total:				\$2,155.00

# *Spreadsheets for Data Management*

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A spreadsheet is often used as a simple form of a "database". A database is an organized representation of information.

- ◆ Examples: schedules and calendars, timesheets, expenses and finances, records, notes, and recipes, data research/analysis

We can use a spreadsheet as a database by:

- ◆ Using a row to store all the information about something we want to represent.
- ◆ Giving each column a meaningful name. A column represents a property or feature of the object stored in the row.
- ◆ Using the formulas to calculate new facts from the data.
- ◆ Using sorting to organize the data by key features.
- ◆ Using simple filtering (querying) to only show the most important data or data of interest.

# Filtering

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A **filter** shows a subset of the rows in the spreadsheet by only showing rows that pass a given condition (test).

For our purposes, the **Auto Filter** under the **Data** then **Filter** menu is sufficient.

Once you select `Auto Filter`, each column heading has a drop-down list. By selecting a filtering criteria from the list, you can limit the rows that are displayed.

It is possible to filter on more than one column at the same time.

# Filter Example

Filter on Total column: Can select a value, Top 10 items, or write a custom filter.

The screenshot shows Microsoft Excel with a spreadsheet titled 'Activity.xls [Compatibility Mode]'. The 'Home' tab is active. The spreadsheet contains an 'Activity List' with columns: Date, Description, Hours, Rate, and Total. The 'Total' column is filtered, and a dropdown menu is open over cell D4, showing options for sorting and filtering. The 'Total' column values are: \$400.00, \$400.00, \$360.00, \$360.00, \$300.00, \$125.00, and \$210.00. The 'Total' cell (D11) shows a total of \$2,155.00.

	A	B	C	D	E	F	G	H	I	
1		<b>Activity List</b>								
2	<b>Date</b>	<b>Description</b>	<b>Hours</b>	<b>Rate</b>	<b>Total</b>					
3	1-May	Meet with client	8	\$ 50.00	\$ 400.00					
4	2-May	Design program	5	\$ 80.00	\$ 400.00					
5	3-May	Write initial prototype	9	\$ 40.00	\$ 360.00					
6	4-May	Write initial prototype	9	\$ 40.00	\$ 360.00					
7	5-May	Test prototype	6	\$ 50.00	\$ 300.00					
8	6-May	Deploy program	5	\$ 25.00	\$ 125.00					
9	7-May	System-wide testing	6	\$ 35.00	\$ 210.00					
10										
11		<b>Total:</b>			<b>\$2,155.00</b>					
12										
13										
14										
15										

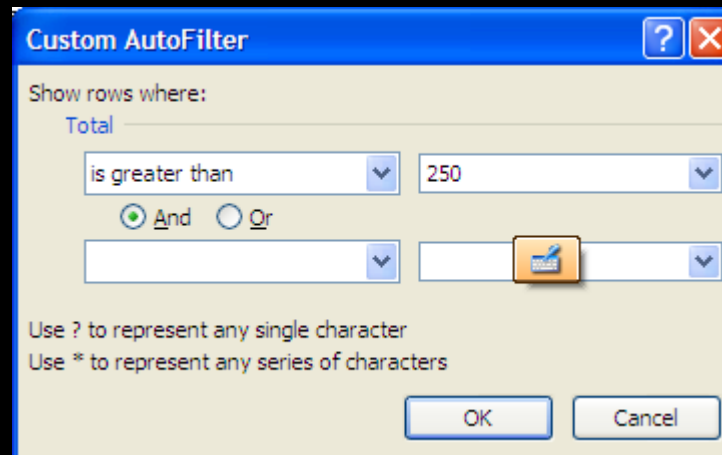
Dropdown menu options for the 'Total' column:

- Sort Smallest to Largest
- Sort Largest to Smallest
- Sort by Color
- Clear Filter From "Total"
- Filter by Color
- Number Filters
  - (Select All)
  - \$125.00
  - \$210.00
  - \$300.00
  - \$360.00
  - \$400.00



# Custom Filter Example

Filter on Total column: Custom filter with **Total > 250**



# Custom Filter Result

Filter on Total column: Custom filter result with **Total > 250**

The screenshot shows a Microsoft Excel spreadsheet titled 'Activity List' with the following data:

Date	Description	Hours	Rate	Total
1-May	Meet with client	8	\$ 50.00	\$ 400.00
2-May	Design program	5	\$ 80.00	\$ 400.00
3-May	Write initial prototype	9	\$ 40.00	\$ 360.00
4-May	Write initial prototype	9	\$ 40.00	\$ 360.00
5-May	Test prototype	6	\$ 50.00	\$ 300.00
Total:				\$2,155.00

The 'Total' column is filtered to show values greater than 250. The 'Rate' column for the second row is highlighted in green.

# Conclusion

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**Spreadsheets** are programs for storing and manipulating data that is represented as a table of cells.

Each **cell** has a row number and column label which combine to represent its address. A cell can contain a number, text, date, or a formula that calculates its value.

Spreadsheets allow you to organize data and write formulas to do computations. They are a powerful tool for data storage and analysis.

# Objectives

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- ◆ Define: spreadsheet
- ◆ Explain how cells are addressed in a spreadsheet.
- ◆ List some of the ways to select cells in a spreadsheet.
- ◆ Explain: filling
- ◆ Define and explain: formula
- ◆ Explain how an aggregate function works. List some examples.
- ◆ Explain the usefulness of charts.
- ◆ Define: conditional formatting
- ◆ Explain how spreadsheets can be used as a database.