



November 1, 2018

# Excel Essentials

Jim Snediker

Suzi Huisman



# What is a Spreadsheet?



A spreadsheet is the computer equivalent of a paper ledger sheet.

<i>paper ledger</i>	
<i>car loan</i>	<i>\$12,000</i>
<i>interest</i>	<i>9.6%</i>
<i># of payments</i>	<i>60</i>
<i>monthly payment</i>	<i>\$252.61</i>

	A	B	C
1		<b>computer ledger</b>	
2			
3		car loan	\$12,000.00
4		interest	9.60%
5		# of payments	60
6			
7		Monthly Pmt.	\$252.61






Worksheet – new name for Spreadsheet



Workbook – one file containing multiple worksheets. Suffix is .xls for Excel 2003 and .xlsx for Excel 2007 and beyond.



# Common Spreadsheet Applications

-  Financial tracking and analysis
-  Database (mailing list, membership list, etc.)
-  Scientific and engineering calculations





# Worksheet terminology

Columns                      Labels                      Values

Rows

	A	B	C	D	E
1	<b>Expense(in\$)</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Total</b>
2	Mortgage	900	900	900	2700
3	Telephone	120	90	110	320
4	Gas	220	220	180	620
5	Insurance	60	60	60	180
6	<b>Total</b>	1300	1280	1250	3830

Cells

There are over 16 million cells per worksheet!

Columns: A – Z then AA, AB, etc

Rows: 1 - ?

An individual cell can hold up to 65,000 characters!



# Cell Address

	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

**Cell  
C6**



# Cell Data

<b>Data type</b>	<b>Examples</b>	<b>Description</b>
<b>LABEL</b>	<b>Name or Wage or Days</b>	Anything that is just text
<b>NUMBER or VALUE or CONSTANT</b>	<b>5 or 3.75 or -7.4</b>	any number
<b>FORMULA</b>	<b>=b3+c3 or =c8*b5+a3</b>	math calculation

Cells may also contain comments and formatting info



# Components of the Excel window

Quick Access Toolbar

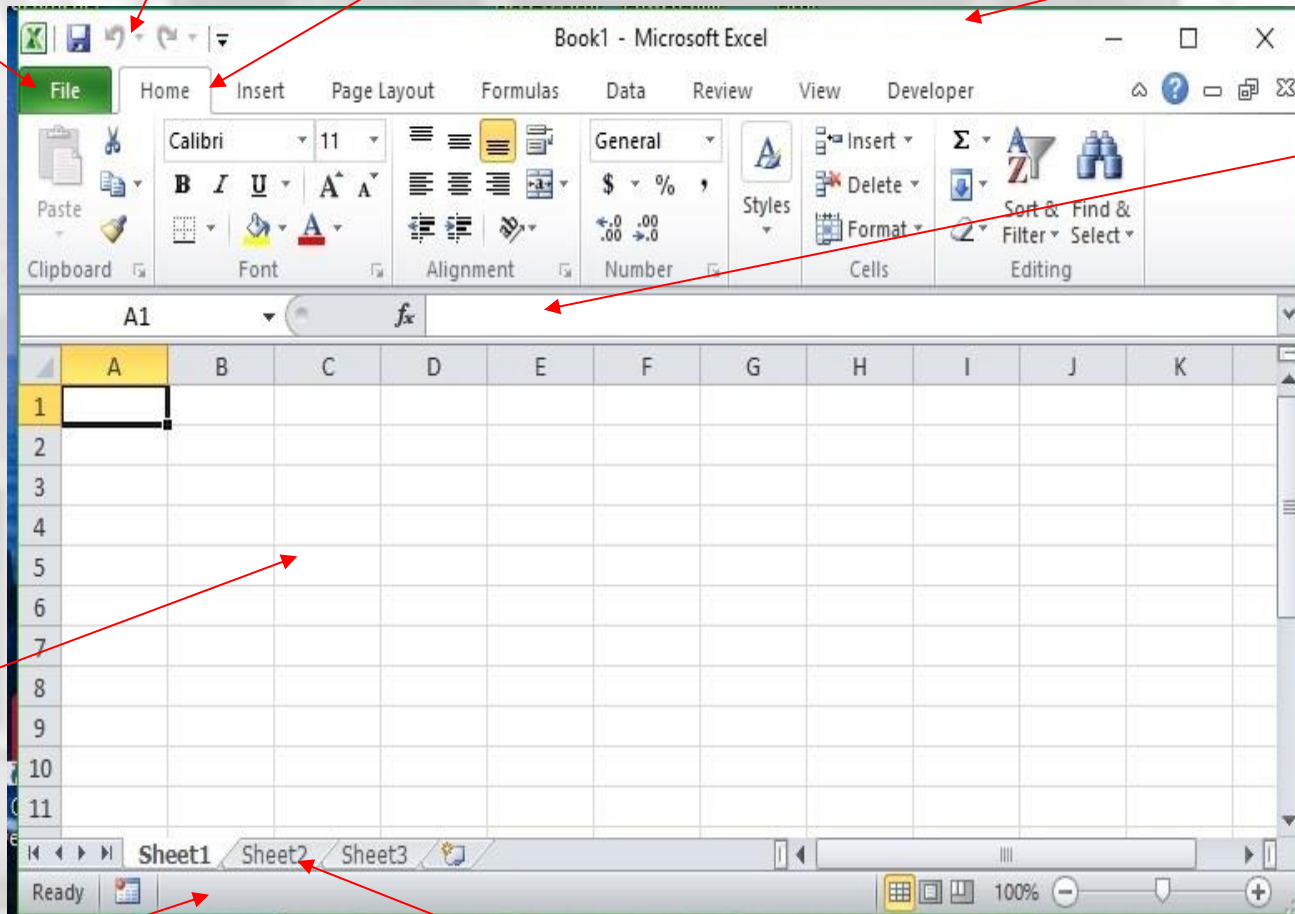
File Menu

Context Tabs

Title bar

Ribbon

Formula bar



Active worksheet

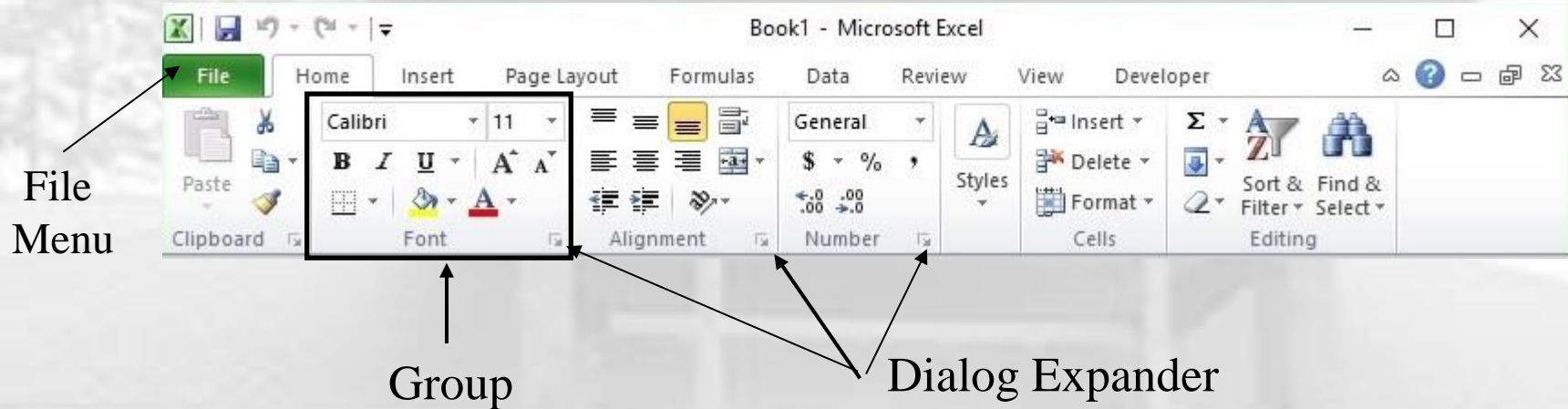
Status bar

3 spreadsheets in workbook





# Excel Ribbon



Ribbon commands are divided into 7 or more tabs



Each tab contains a series of groups



Each group has a series of related controls



Dialog Expander opens a related dialog box










File menu also contains commands



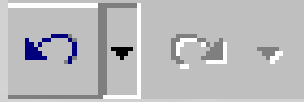


# File Menu

-  **New** – open a new spreadsheet file
-  **Open** an existing spreadsheet file
-  **Recent** – open a spreadsheet that you have been using recently
-  **Save As** – new file name and/or location
-  **Save** an updated spreadsheet file
-  **Print** a spreadsheet (all or part)
-  **Close** the spreadsheet



# Buttons: Undo and Redo



The Undo button lets you reverse an action you just performed.



Redo lets you change your mind and do that action all over again.



Excel keeps track of only the last 16 actions.



# Formula Bar



Shows the contents of a selected cell, whether it is plain text, numbers, or a calculation formula.



The **Name Box** shows the **cell reference** or the **name** of the active cell. For a range, only the upper left cell reference is shown.

The screenshot shows an Excel spreadsheet interface with several components labeled with yellow boxes and red arrows:

- Name Box:** Located at the top left, it displays "B3".
- Formula Bar:** Located below the Name Box, it displays "This is cell B3".
- Column Headings:** The top row of the spreadsheet, labeled "A", "B", "C", and "D".
- Row Headings:** The leftmost column of the spreadsheet, labeled "1", "2", "3", and "4".
- Active Cell:** The cell at the intersection of row 3 and column B, which contains the text "This is cell B3".
- Gridlines:** The thin lines that separate the cells in the spreadsheet.



# Formula Bar Buttons

The buttons on the formula bar act on the selected cell, which has its contents displayed in the box to the right of these buttons. These buttons are enabled only when you are entering data into a cell.



The **red X** cancels your changes if you haven't entered the data yet. Pressing the ESC key does the same thing. If you have already entered the data into the cell, you can use the Undo command to reverse what you did.



The **green check mark** enters what you typed into the cell and leaves the cell selected. Pressing the ENTER key also makes the cell accept what you typed, but then it changes the selection to the cell below, by default.



# Object / Action



One of the basic principles of the Graphical User Interface is “object / action.” Select the object of interest and then choose the action to be taken on that object.



In Excel, select the object (cells, row, column, text, etc.) and then right-click with the cursor over the object to bring up the shortcut menu listing the available actions.



Left-click on the desired action.



# Shortcut menu (Example)



Appears when you right-click an object or screen element



Provides a short list of commands related to the screen element or object to which you're pointing



Contains Cut, Copy and Paste commands, among others





# Selecting Cells and Ranges



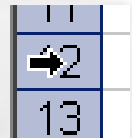
To select a:



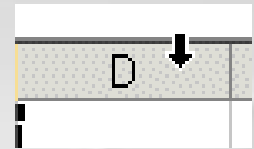
Single Cell – click on the cell



Single Row – click on the row number



Single Column – click on the column letter



To de-select:



Select something else





# Selecting multiple Cells, Rows, Columns



## Contiguous cells



Use the mouse and drag across cells

**OR**



Click the upper-left cell, press and hold  
SHIFT, click the lower-right cell



## Non-contiguous cells



Click the 1<sup>st</sup> cell



Press and hold CTRL






Click the remaining cells







# Cell operations

-  You **enter data** when you type text or numbers or formulas into a cell. If a cell already has data, your typing overwrites the existing data.
-  You **edit data** when you make changes to existing data in a cell.
-  You **clear data** when the cell's contents are erased, but the cell itself is not deleted.



# Data Types







 Labels can be letters and numbers or (‘) as first char before numbers (e.g., ‘2004)

 Numbers begin with a digit or +, -, ., \$

 Formulas begin with an =





# Entering Data

-  Select cell and type directly into the cell  
**OR**
-  Select cell and then Click in Formula Bar to type the data in the Formula bar
-  Complete typing using Enter key or other navigation key (Tab, Arrow, etc.) or 
-  Cancel typing using Esc or 





# Editing Data

## Editing options

 Double-click cell and make changes directly in the cell. Press Enter key or click on green checkmark. 

**OR**

 Select cell to be edited and make corrections in the Formula Bar. Press Enter key or click on green checkmark. 



# Clearing Cells



## Clearing options




Select cell(s) to be cleared



Press **Delete** key

**OR**





On the Home tab , in the Editing group, click on the arrow next to the Clear button,  and then select Clear Contents



The data in the cell is erased. Any formatting will remain and will be applied to new data that you enter later



# Moving data in worksheets

1. Select the cell(s) you want to move
2. Right-click and select **Cut**, or click  , or press Ctrl+X
3. Select the destination cell(s) for the data
4. Right-click and select **Paste**, or click  , or press Ctrl+V





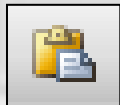
Home tab, Clipboard group





# Copying data in worksheets

1. Select the cell(s) you want to copy
2. Right-click and select **Copy**, or click  , or press Ctrl+C
3. Select the cell(s) you want to copy the data to
4. Right-click and select **Paste**, or click  , or press Ctrl+V



Home tab, Clipboard group



# Copying using the Fill handle

Fill handle is the small black square in the lower-right corner of the selection. When you point to the fill handle, the pointer changes to a black cross  $+$



Fill handle

1. Select the cell(s)
2. Point to the fill handle; look for black cross
3. Drag the fill handle over the adjacent cells into which you want to copy the data





# Example worksheet

The screenshot shows a Microsoft Excel spreadsheet titled "Textbooks 2.xls [Compatibility Mode] - Microsoft Excel". The ribbon is set to "Home". The worksheet contains a table with the following data:

	A	B	C	D	E	F	G	H	I
1									
2			Textbook Order						
3									
4		Textbook	Quantity	Price	Extension				
5									
6		Biology	4	\$99.99	\$399.96				
7		Chemistry	2	\$79.95	\$159.90				
8		Calculus	7	\$65.99	\$461.93				
9		English	12	\$49.99	\$599.88				
10									
11				Subtotal	\$1,621.67				
12			6%	Sales tax	\$97.30				
13				Total	\$1,718.97				
14									





# Formatting

You can format cell(s), row(s) & columns(s)

- Select the object(s) to be formatted
- Apply the format action from the **Font**, **Alignment** or **Number** group
- Additional actions available using the **Dialog Expander**
- You can also right-click over selection and pick **Format Cells** from the menu



# Formatting (Con't)

Some additional formatting options

- Adjust column width and row height
- **Wrap text** within a cell
- **Merge & Center** – center data across a range of cells
- Copy formatting using the **Format Painter** in the Clipboard group



# Formatting (Con't)

Adjust column width

- Drag right border in column header
- Double click right border for automatic column width adjustment
- Right click in column header and select Column Width from menu

Adjust row height – height is adjusted automatically in most cases. Can also drag border





# Formatting (Con't)

## Merge & Center

- Select the range including the data to be centered
- Click Merge & Center in the Alignment group

“Unmerge” using the Unmerge option in the Merge & Center dropdown







# Formulas in Excel



In Excel, we use formulas to perform calculations. For example,



Calculate totals and averages



Calculate percentage increase or decrease



Calculate sales tax or sales commission



Calculate interest to be earned






Calculate annuity payments



Calculate various scientific and engineering values



# Formulas in Excel

-  Formulas are cell entries that have a mathematical statement which calculates the value to display.
-  We enter the formula into the cell; Excel calculates the result and displays the value in the cell.
-  This displayed result will be updated upon the change or entry of any data that is referenced in the equation.

	A	B	C
1		<b>computer ledger</b>	
2			
3		car loan	\$12,000.00
4		interest	9.60%
5		# of payments	60
6			
7		Monthly Pmt.	\$252.61



# Formula Operations



The basic operations and their symbols are:

add +   subtract -   multiply \*   divide /   power ^



Formulas follow the rules of algebra. Numbers can be positive or negative. There is a defined order of operations.



Formulas can contain constants as well as cell references. So for example, writing 125% in a formula is the same as the number 1.25 and 50% is the same as .50.



# Order of operations


$$12 + 4 / 2 = ?$$

$$(12 + 4) / 2 = 8$$

$$12 + (4 / 2) = 14$$



# Order of operations

 When the formula involves several operations, Excel has to know in what order to do them. For example, in  $12 + 4 / 2$  Excel will divide first and then add 12, which results in an answer of 14. This is not the same as  $(12 + 4) / 2$  where Excel will add first (because of the parentheses) and then divide, resulting in an answer of 8.

The order of operations is: Please Excuse My Dear Aunt Sally

Any calculations inside Parentheses ( )

Negation -

Percentage %

Exponents ^

Multiply and Divide \* /

Add and Subtract + -



# Formula Examples

The equal sign is **required**.

=B3 \* C14 Multiply the value in cell B3 by the value in C14

=D12 - B3 Subtract the value in cell B3 from the value in D12

=(A10 + B5) / C4 Add the values in cells A10 and B5 and then divide by the value in C4

=C7 + (C7 \* 10%) Compute a 10 percent increase in the value contained in cell C7

=B3^3 Raise the value in B3 to the power 3. This is the same as =B3\*B3\*B3



# Entering formulas

1. Select the cell where you want the result to appear
2. Type the formula beginning with = sign. Cell references can be lower case.

	A4		=	=A2+A3
	A	B	C	
1				
2	45			
3	66			
4	111			
5				

The result is displayed in the cell. The formula is shown in the Formula Bar.





# Entering Cell References Using the Mouse

1. Select the cell to enter the formula
2. Type =
3. Click the cell for which you want to enter a reference; e.g. A1, B2, C3.
4. Type an operator (+, -, \*, /, ^)
5. Repeat steps 3 and 4 until you've created the formula you want
6. Press Enter





# Moving & Copying Formulas



Formulas contain cell references, values, operators, and functions



Formulas can be moved or copied in the same way that you move or copy any other cell data



Excel **does not** change formulas that are **moved** (same calculation, but in a new location)



Excel **may** change formulas as they are **copied** into new cells (calculation changed to suit the new location)



# Copying using the Fill handle

Fill handle is the small black square in the lower-right corner of the selection. When you point to the fill handle, the pointer changes to a black cross  $+$



Fill handle

1. Select the cell
2. Point to the fill handle; look for black cross
3. Drag the fill handle over the adjacent cells into which you want to copy the data





# Create a Chart

- Select the data to appear on the chart
- Go to the **Insert** tab on the ribbon
- In the **Charts** group, select the type of chart to be created
- Use the **Chart Tools** to edit chart features





# Excel Formulas Example

Bill Jones, age 45, invested \$10,000 in a Mutual fund that averages 8% appreciation per year. He plans to add an \$500 at the end of each year. Create a spreadsheet that shows the projected year by year growth of his investment until his retirement at age 65. For each year, show his age, the beginning balance and the ending balance.



# Excel Formulas Example

Bill Jones Investment Display.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2				Bill Jones Investment								
3												
4			Beginning				Ending					
5	Year	Age	Balance	Rate	Growth	Deposit	Balance					
6												
7	2016	45	\$10,000	8%		\$500						
8	2017											
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												

Formula to compute Ending Balance

Formula to compute Growth

Formula - start of year 2 equals end of year 1