2. INTRODUCTORY EXCEL

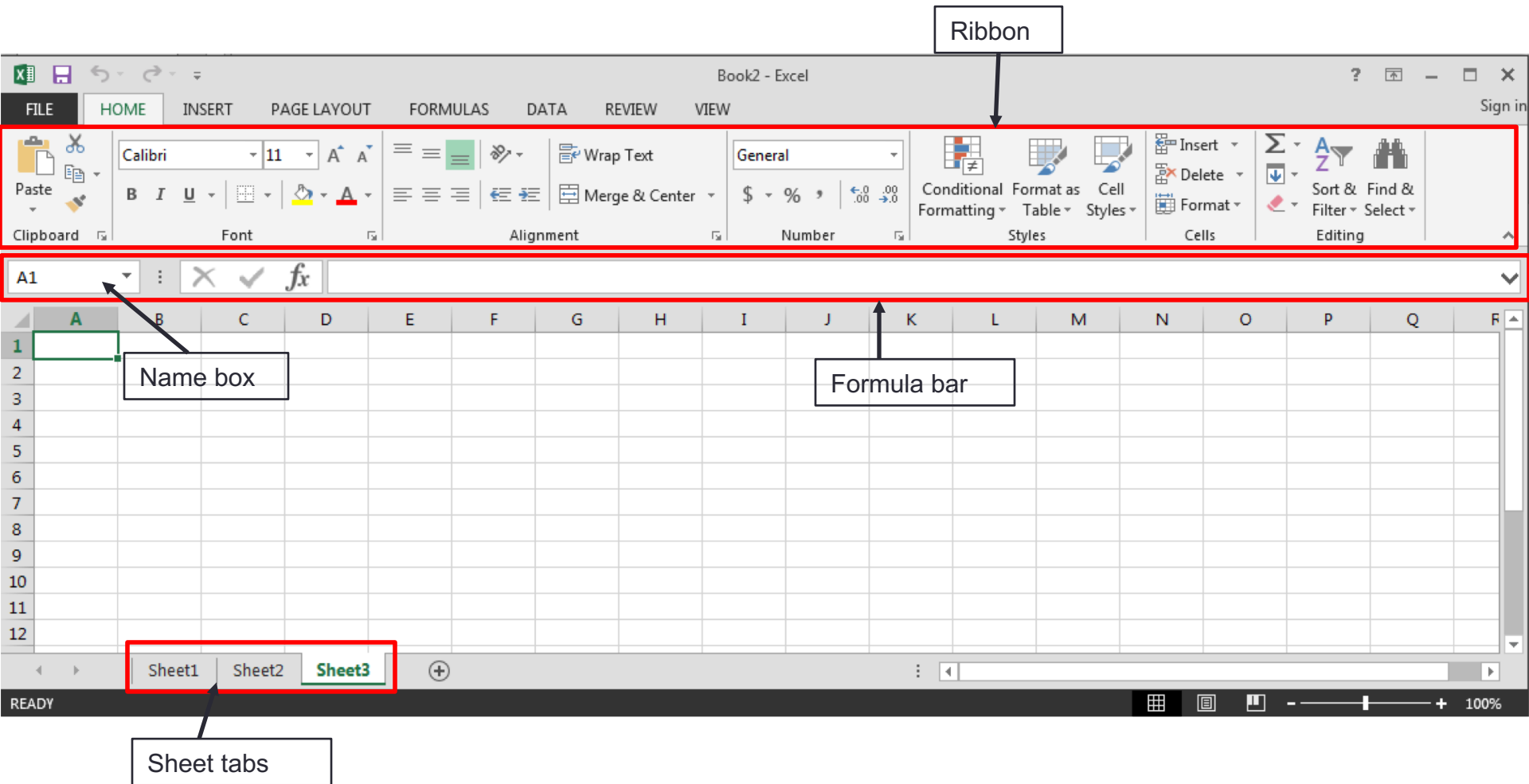Winter 2019

Introduction to Excel

- What is Microsoft Excel?

- What can we do with Excel?

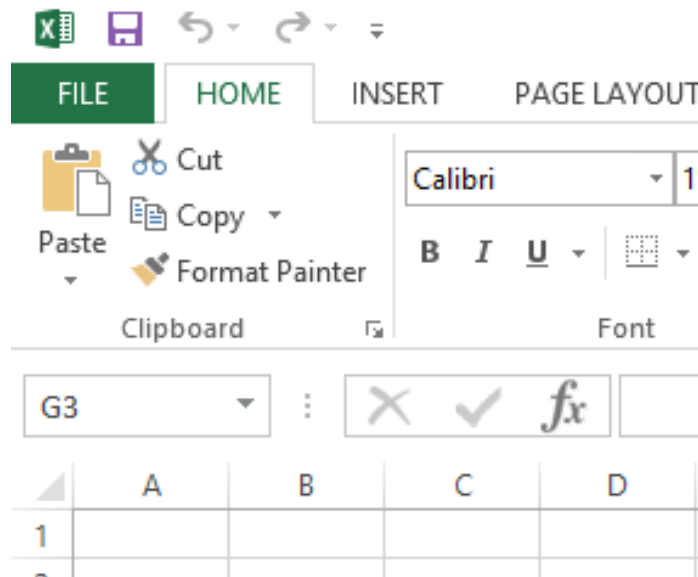# Launch Excel

Launch Excel
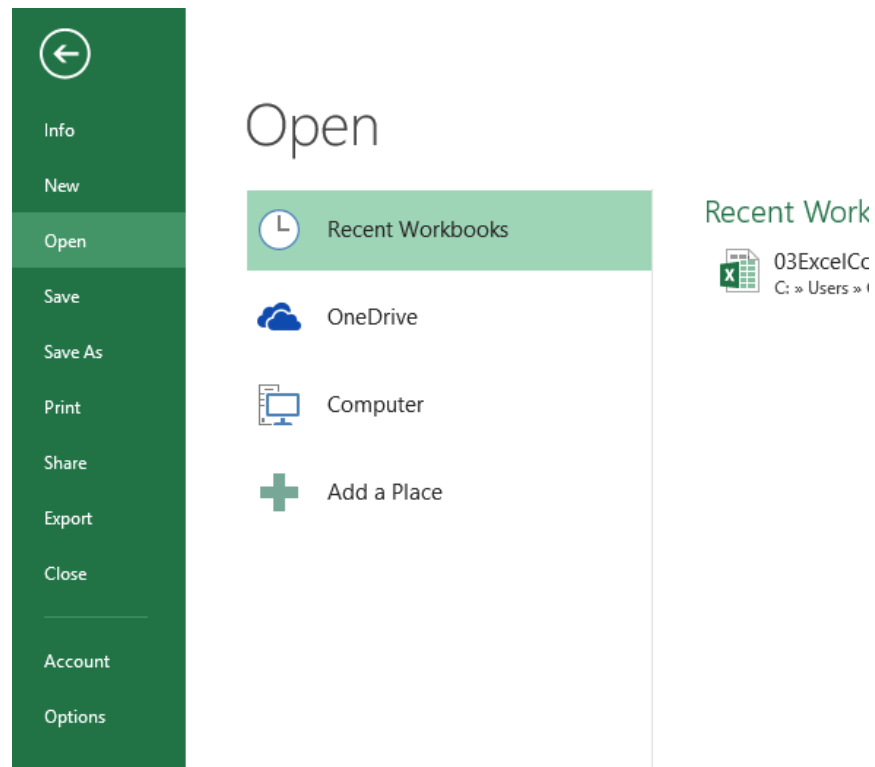

Ribbon

Name box

Formula bar

Sheet tabs
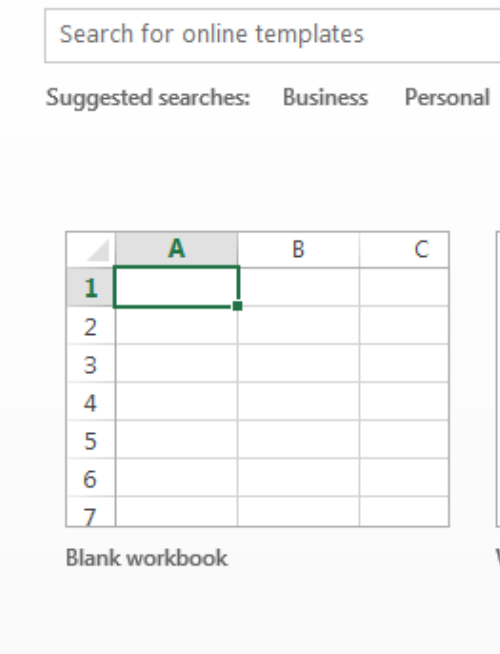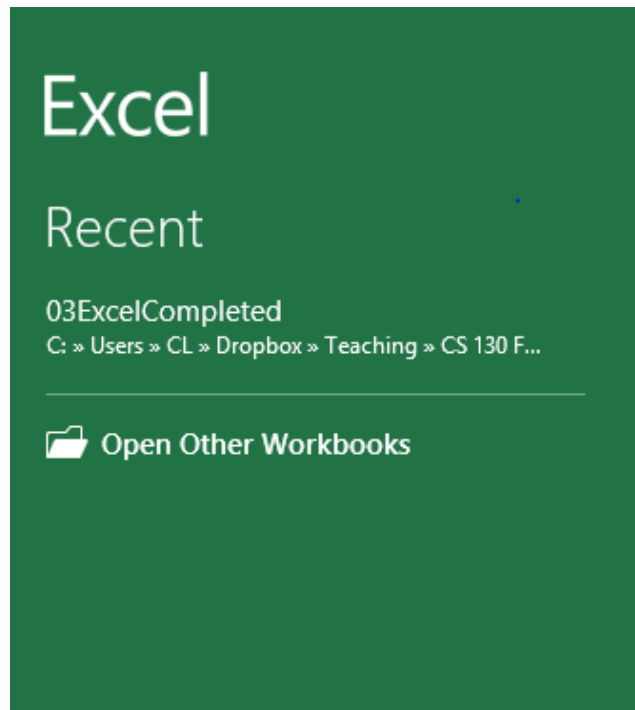
Excel Functionality

- As with all Office 2016 applications, Excel's functionality is divided into Ribbons or Tabs

- Select the appropriate Tab to use some Excel functionality

File Menu

Data Organization in Excel

- Workbook

- Worksheets

  - Worksheets can be renamed. How?

  - Worksheets can be added. How?

Excel Structures

- Worksheets consist of a grid of rows and columns. Each worksheet consists of cells, which are the basic building blocks of every worksheet.

- A cell is referred to by its unique address or cell reference. The cell address is the Column letter and the Row number, for example D13.

- What is an active cell and how do we know which cell is active?
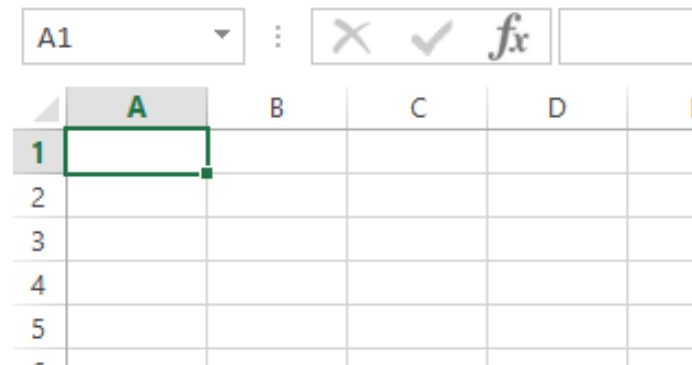
Excel Structure

What if I …. ?
I don't know,
try it out!

- Entering Text
  - Text can be entered by selecting a cell and typing
  - Text is defined as any combination of letters, numbers, and punctuation
  - Text automatically aligns to the left in a cell
- Entering Numbers
  - Numeric entries contain only numbers and are automatically aligned to the right in a cell
  - You can enter:
    - Whole numbers
    - Decimals
    - Negative numbers
    - Percentages
    - Currency
  - Do not put any spaces in a number or Excel will interpret it as text

Excel Structure

- Formulas
  - The work horse of Excel
  - Formulas allow you to perform a calculation in a cell
  - Must begin with an equal sign

- If we place the formula =3+9/3-1 into cell A1, what value gets displayed? Why?

Binary Arithmetic Operators

- Excel contains several binary arithmetic operators.

- What is a binary operator?

- What are the five most common binary operators?

Operator Precedence

What is operator precedence or order of operations?

What is the operator precedence for Excel's binary operators?

Evaluate

What is the value produced by evaluating each of the following Excel formulas:

▸ =2+4/2

▸ =4/0

▸ =0/4

▸ =2*3+5/2

▸ =2*/3

▸ =2*-1

Showing Formulas

- When you write a formula in Excel (recall a formula starts with an = sign), the formula is hidden and the solution to that formula is displayed

- You can view all of the formulas in an Excel sheet by selecting the Ctrl and ` keys together. The ` key is the the key that is farthest left on the row of numeric keys or left of the 1 key.

Operator Precedence versus Associativity

- What is the difference between operator precedence and operator associativity?

- Operator Precedence

- Operator Associativity

Cell References

- Not only can numbers be placed in cell formulas, but cell references can be used in cell formulas.

- What does the following formula mean? =A1+2

Problem 2.1

1. Place the values 10, -3 and 22 in the cells A1, A2, and A3 respectively.

2. In cell, A4, write the formula to find the average of the values in cells A1 to A3.

3. Change the value in cell A2 to 15, and the value in cell A4 will be modified as soon as you hit return.

Note: Excel always updates the entire worksheet any time a change is made to any worksheet cell.

Saving Workbook & Worksheets

- For each Problem in this class, you are to create a new worksheet with the Problem name (e.g. Problem 2.1)
  - One file with all of your class work

- Save the Workbook as PUNetIDProblems
  - Backup on to Grace, Box, or USB stick

- Occasionally, I will have you drop your Workbook in the CS130 Drop folder on Grace

Named Cells

- You can name a cell rather than reference it through its address. This allows us to give meaningful names to values for use in formulas.
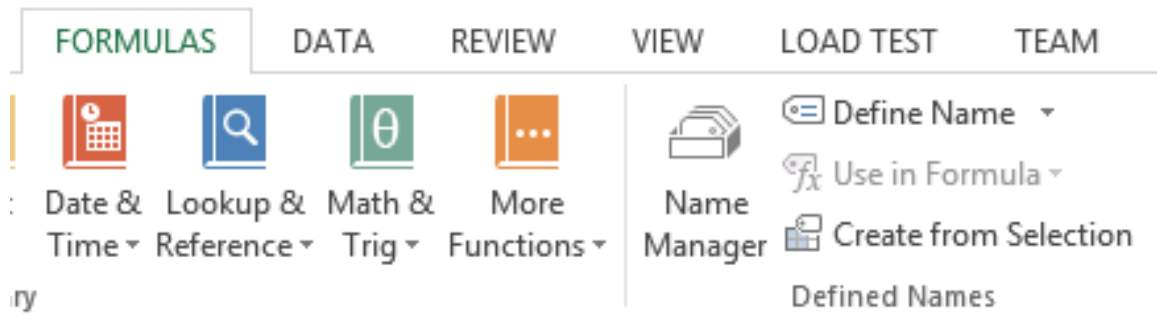
Problem 2.2

1. Create a new worksheet.

2. Place your age in cell A1. Using the **Formulas** Tab, **Define Name** of cell A1 to *MyAge*.

3. In cell A2, write the number of years left you have in college, name that cell *YearsLeft*.

4. In cell A3 write a formula to determine your age when you graduate college. Use the cell names in your formula.

Problem 2.3

	A	B	C	D	E	F	G	H	I
1	**Grocery Calculator**								
2									
3	Item	**Eggs**	**Milk**	**Bread**	**OJ**	**Apples**	**Carrots**		
4	Cost	$ 2.79	$ 3.49	$ 2.50	$ 2.35	$ 1.79	$ 0.99		**Total Cost**
5	Count	1	0	2	2	3	1		$ 18.85
6									
7									

Making the Data "Pretty" and Functional

- Formatting
  - Excel provides some advanced formatting capabilities to make your spreadsheet look more professional.

  - Cell formatting
    - Right-click on the cell, Format Cells, Number Tab
    - How many ways can we format numeric data?
    - There are also formatting buttons on the Home tab

- Any numbers that you have in your worksheet must be formatted appropriately.

Excel Error Message and Codes

| ####	shows that the cell is too narrow to display the value
#DIV/0!	formula is trying to divide by 0 (zero)
#na	No information is available for the calculation you want to perform
#NAME?	Excel doesn't recognize a name used in the formula
#NULL!	you have specified an intersection of two areas that do not intersect. Not a common error!!
#REF!	cell reference used in the formula is not valid.
#VALUE!	an argument or operand is of the wrong type. For example, you may have attempted to calculate with a cell containing text

Functions

- Quick Mathematics Review
  - As it turns out, some of the most important mathematics for this course revolves around the concepts of exponential and logarithmic functions.
  - Function - a relation in which each element in the domain is associated with only one element in the range

- What can you say about the function $f(x)=x+5$?

- What are a couple of more simple functions?

Excel Built-in Functions

- Functions are special routines provided by Excel to do simple and complex calculations.

- Click on the Formulas Tab to see the following:
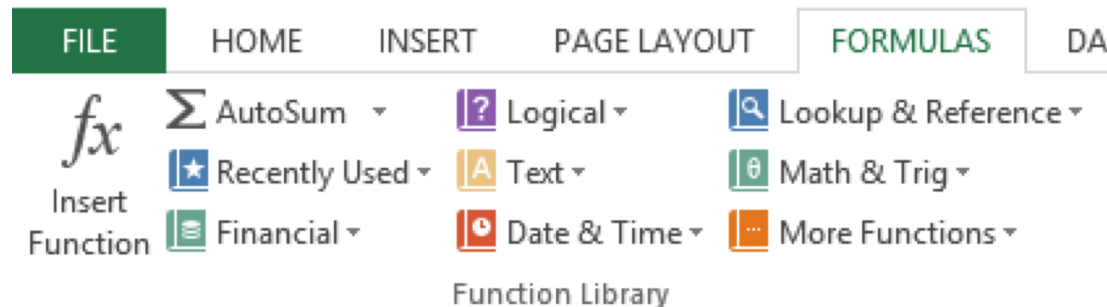
- Click on the Math & Trig icon and you will see all of the Excel functions for this category

Excel Function Syntax

- The basic syntax for an Excel function is carried over from algebra and includes the following:
    - The function name
    - A left parenthesis
    - A list of arguments where each argument is separated by a comma
    - A right parenthesis

- The INT function rounds a number down to the nearest integer
    - What is the value of =INT(3.75)

    - What is the value of =INT(-3.75)

Excel Functions

- In general, Excel functions take the form: name(arg1, arg2,…) where the number of arguments depends on the function being used.

- Find a function in the Math & Trig library that uses two arguments. Show how the function works.

Range of Cell Values

- The : between cell references indicates a range of values inclusive. So, A1:A5 means include cells A1, A2, A3, A4, A5.

- Any ideas how we might rewrite the formula =A1+A2+A3+A4+A5

- Excel is not case-sensitive. What does this mean?

Problem 2.4

- Students in a Chemistry class were given an exam and were then tested monthly with an equivalent exam. The average score was given by the function below, where t is the time in months:

$$f(x) = 80 - 17\log_{10}(t + 1), 0 \le t < 12$$

- Design a worksheet called Problem 2.4, that allows the user the ability to enter a time t in months and calculates the average exam score.

- Answer each of the following questions in an Excel comment

  - What was the average score on the original exam?
  - What was the average score after 4 months?
  - What was the average score after 10 months?

Filling Cells

- Many times when creating an Excel worksheet, you want to get some pattern going so you can fill down, right, or both down and right.

Problem 2.5

- Students in a Chemistry class were given an exam and were then tested monthly with an equivalent exam. The average score was given by:
  - $f(x) = 80 - 17 \log_{10}(t + 1), 0 \le t < 12$, where t is the time in months.

- Design a worksheet that shows the average score for all values of t (0 to 11)