CSCI-1102: Introduction to Computing

Microsoft Excel 3: Formulas and Functions

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Formulas

- One of the most powerful features in Excel is the ability to calculate numerical information using formulas.
- Just like a calculator, Excel can add, subtract, multiply, and divide. In this lesson, we'll show you how to use cell references to create simple formulas.

Mathematical operators

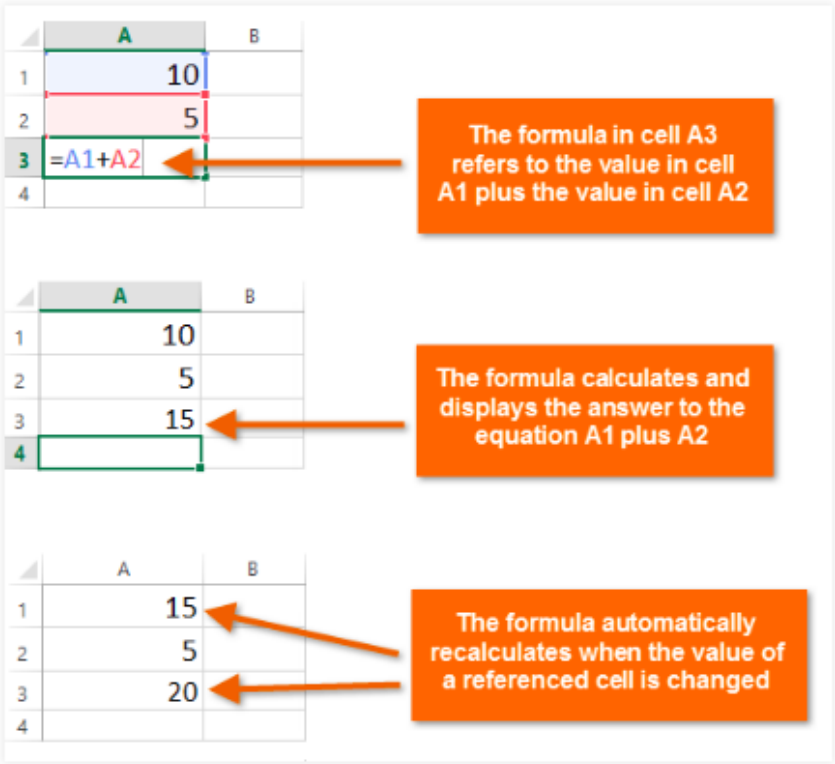
- Excel uses standard operators for formulas, such as a plus sign for addition (+), a minus sign for subtraction (-), an asterisk for multiplication (*), a forward slash for division (/), and a caret ($\hat{}$) for exponents.

Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponents	^

- All formulas in Excel must begin with an equals sign (=). This is because the cell contains, or is equal to, the formula and the value it calculates.

Understanding cell references

- While you can create simple formulas in Excel manually (for example, =2+2 or =5*5), most of the time you will use cell addresses to create a formula. This is known as making a cell reference.
- Using cell references will ensure that your formulas are always accurate because you can change the value of referenced cells without having to rewrite the formula.



Understanding cell references

- By combining a mathematical operator with cell references, you can create a variety of simple formulas in Excel.
- Formulas can also include a combination of cell references and numbers, as in the examples below:

=A1+A2	Adds cells A1 and A2
=C4-3	Subtracts 3 from cell C4
=E7/J4	Divides cell E7 by J4
=N10*1.05	Multiplies cell N10 by 1.05
=R5^2	Finds the square of cell R5

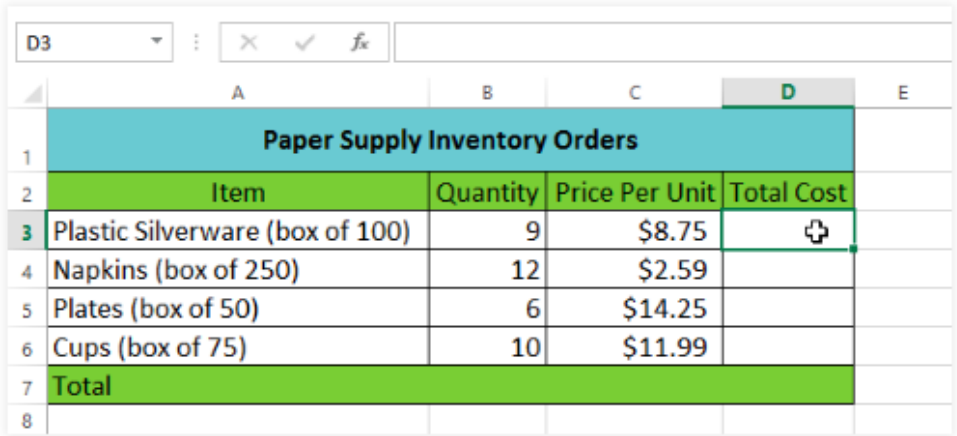
Understanding Relative references

- By default, all cell references are relative references. When copied across multiple cells, they change based on the relative position of rows and columns.
- For example, if you copy the formula =A1+B1 from row 1 to row 2, the formula will become =A2+B2.
- Relative references are especially convenient whenever you need to repeat the same calculation across multiple rows or columns.

To create a formula using the point-and-click method

- Rather than typing cell addresses manually, you can point and click on the cells you want to include in your formula.
- This method can save a lot of time and effort when creating formulas.
- In our example below, we'll create a formula to calculate the cost of ordering several boxes of plastic silverware.

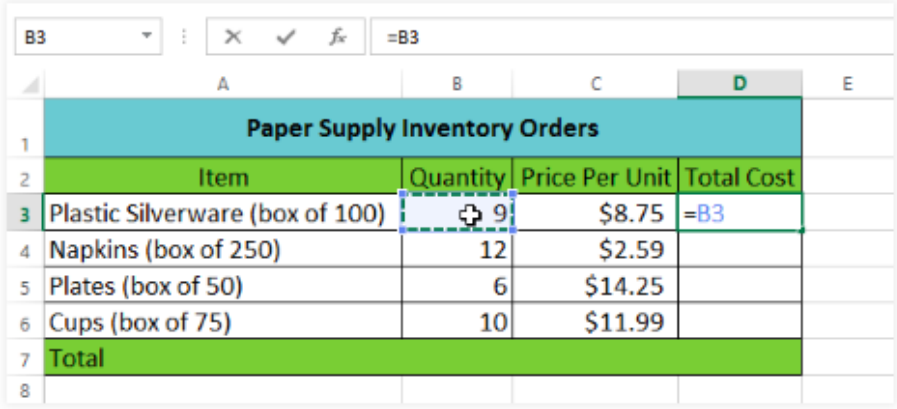
1. Select the **cell** that will contain the formula. In our example, we'll select cell **D3**.



2. Type the **equals sign (=)**.

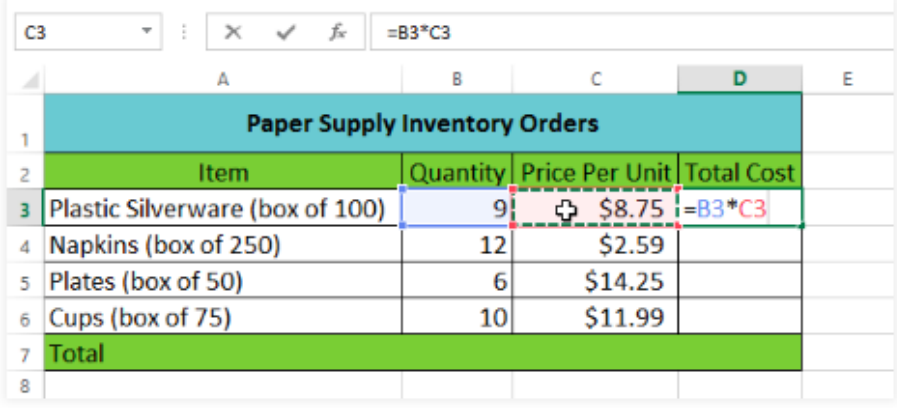
To create a formula using the point-and-click method

3. Select the **cell** you want to reference first in the formula: cell **B3** in our example. The **cell address** will appear in the formula, and a **dashed blue line** will appear around the referenced cell.



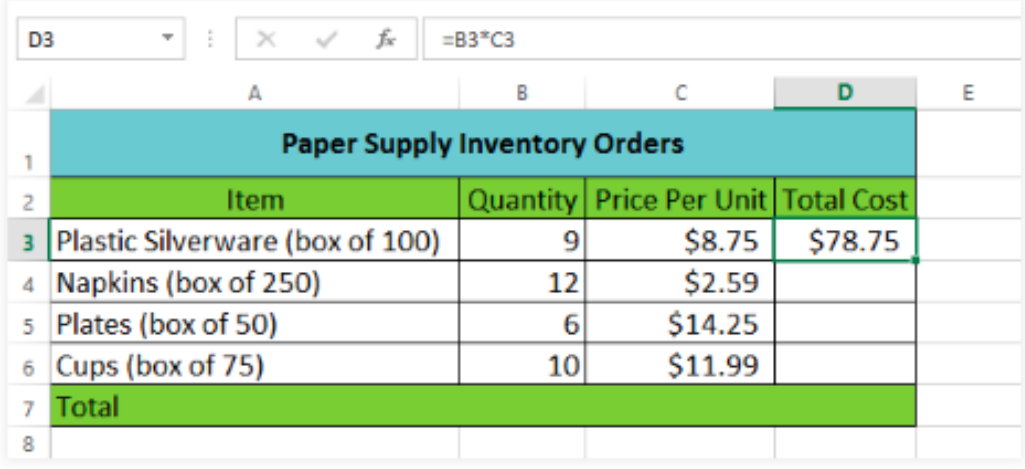
4. Type the **mathematical operator** you want to use. In our example, we'll type the **multiplication sign (*)**.

5. Select the **cell** you want to reference second in the formula: cell **C3** in our example. The **cell address** will appear in the formula, and a **dashed red line** will appear around the referenced cell.



To create a formula using the point-and-click method

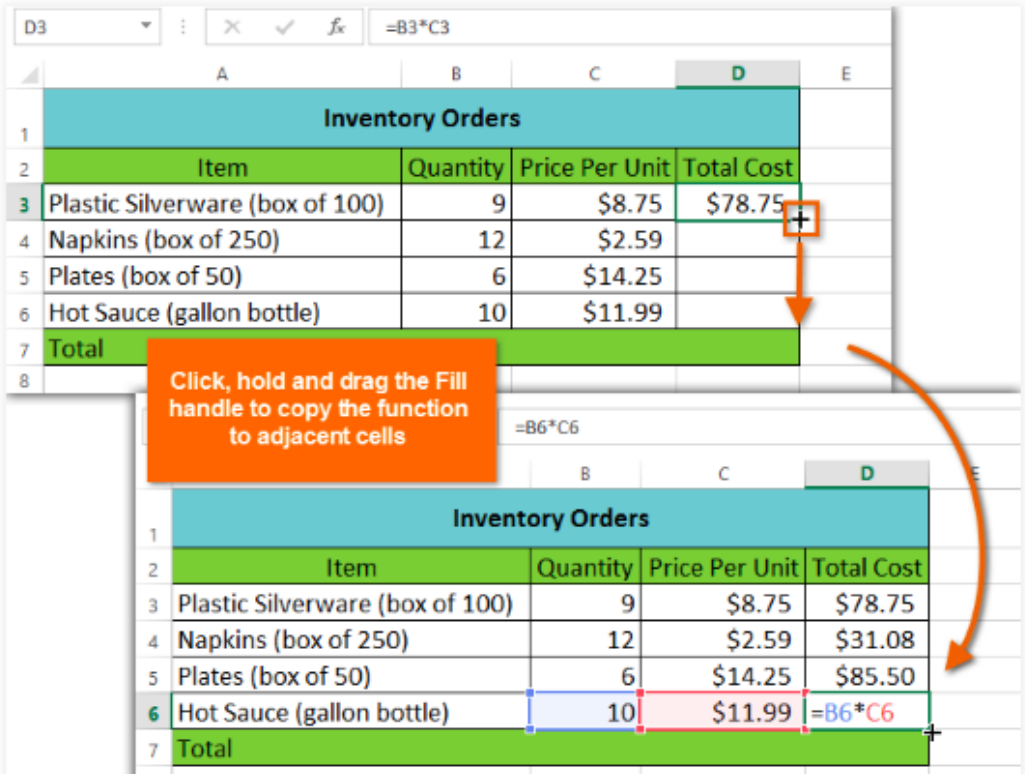
6 Press **Enter** on your keyboard. The formula will be **calculated**, and the **value** will be displayed in the cell.



	A	B	C	D	E
1	**Paper Supply Inventory Orders**				
2	Item	Quantity	Price Per Unit	Total Cost	
3	Plastic Silverware (box of 100)	9	$8.75	$78.75	
4	Napkins (box of 250)	12	$2.59		
5	Plates (box of 50)	6	$14.25		
6	Cups (box of 75)	10	$11.99		
7	Total				
8					

To copy a formula using relative references

- Locate the fill handle in the lower-right corner of the desired cell. In our example, we'll locate the fill handle for cell D3.
- Click, hold, and drag the fill handle over the cells you wish to fill. In our example, we'll select cells D4:D6.
- Release the mouse, the formula will be copied to the selected cells with relative references,and the values will be calculated in each cell.

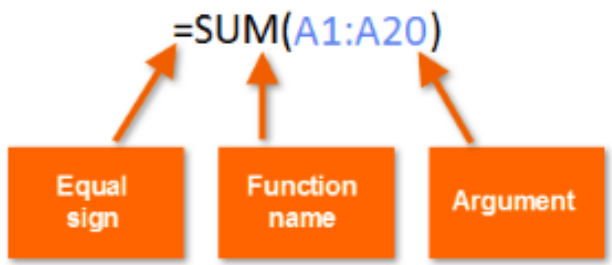


Functions

- A function is a predefined formula that performs calculations using specific values in a particular order.
- Excel includes many common functions that can be useful for quickly finding the sum, average, count, maximum value, and minimum value for a range of cells.

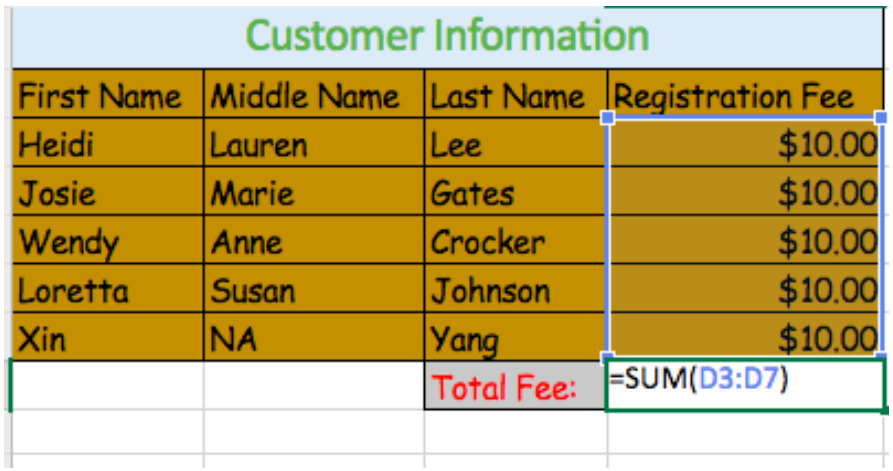
The parts of a function

- In order to work correctly, a function must be written a specific way, which is called the syntax.
- The basic syntax for a function is the equals sign (=), the function name (SUM, for example), and one or more arguments.
- Arguments contain the information you want to calculate. The function in the example below would add the values of the cell range A1:A20.



Working with SUM Function

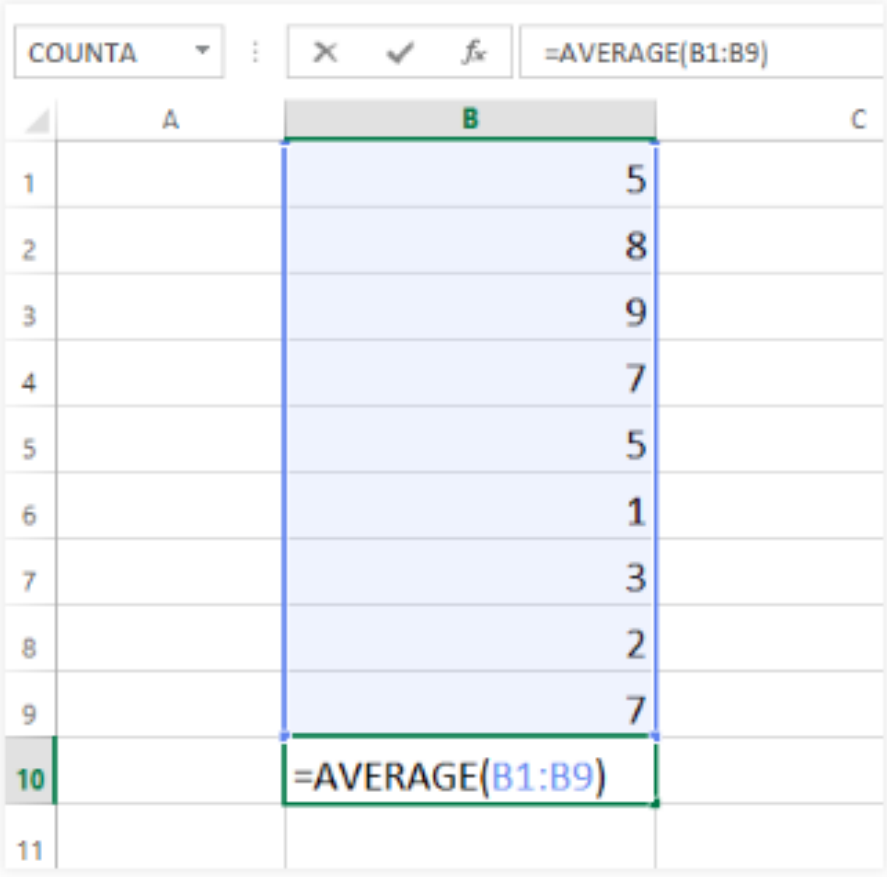
- Arguments can refer to both individual cells and cell ranges and must be enclosed within parentheses. You can include one argument or multiple arguments, depending on the syntax required for the function.
- In our example, the function = SUM(D3:D7) would calculate the total sum of the values in the cell range D3:D7.



Customer Information			
First Name	Middle Name	Last Name	Registration Fee
Heidi	Lauren	Lee	$10.00
Josie	Marie	Gates	$10.00
Wendy	Anne	Crocker	$10.00
Loretta	Susan	Johnson	$10.00
Xin	NA	Yang	$10.00
		Total Fee:	=SUM(D3:D7)

Working with AVERAGE Function

For example, the function **=AVERAGE(B1:B9)** would calculate the **average** of the values in the cell range B1:B9. This function contains only one argument.



Reference

https://edu.gcfglobal.org/en/excel2013/