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**AL-Mustaqbal university college**

**Class: 1ˢᵗ**

**Subject: Computer Applications**

**Lecturer: Rami Qays Malik**

**Lecture :Part-2-4th lec**

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# WORKING WITH BASIC 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. In order to use functions correctly, you'll need to understand the different parts of a function and how to create arguments to calculate values and cell

references.

Formula $=A1+A2+A3+A4+A5+A6+A7+A8$

Function $=SUM(A1:A8)$

## The parts of a function

The order in which you insert a function is important. Each function has a specific order—called **syntax**—which must be followed in order for the function to work correctly. The basic syntax to create a formula with a function is to insert an **equals sign (=)**, **function name** (SUM, for example, is the function name

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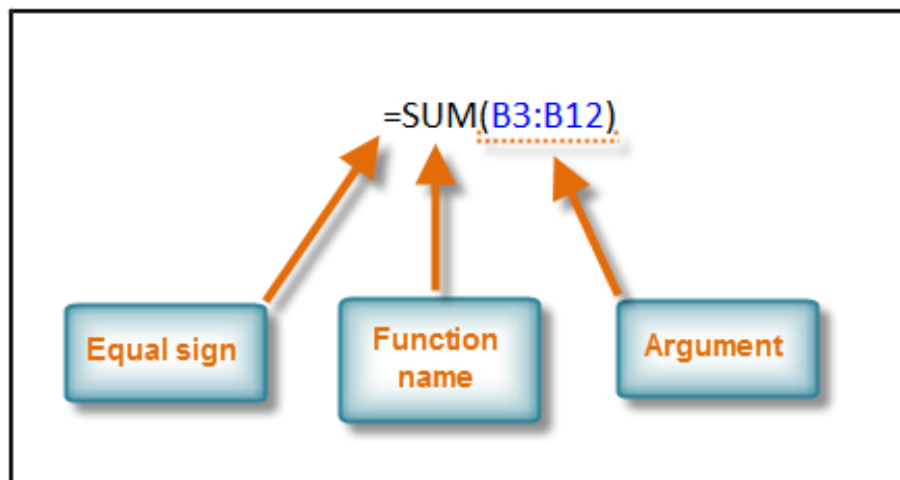**Class: 1ˢᵗ**

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for addition), and **argument**. Arguments contain the information you want the formula to calculate, such as a range of cell references.



# Working with arguments

Arguments must be enclosed in **parentheses**. Individual values or cell references inside the parentheses are separated by either **colons** or **commas**.

- **Colons** create a reference to a range of cells.

  For example, =**AVERAGE(E19:E23)** would calculate the **average** of the cell range E19 through E23.

- **Commas** separate individual values, cell references, and cell ranges in parentheses. If there is more than one argument, you must

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separate each argument by a comma.

For example, =**COUNT(C6:C14,C19:C23,C28)** will **count** all the cells in the three arguments that are included in parentheses.

# To create a basic function in Excel:

1. Select the cell where the answer will appear (**F15,** for example).

2. Type the **equals sign (=)**, then enter the **function name** (**SUM**, for example).

3. Enter the cells for the **argument** inside the parentheses.

| Unit Price | Subtotal | Date Ordered | Date Received |
|---|---|---|---|
| $5.86 | $58.60 | 12-Sep | 17-Sep |
| $40.26 | $80.52 | 12-Sep | 17-Sep |
| $4.20 | $42.00 | 6-Sep | 12-Sep |
| $6.19 | $74.28 | 6-Sep | 12-Sep |
| $3.20 | $48.00 | 6-Sep | 12-Sep |
| $3.40 | $17.00 | 6-Sep | 12-Sep |
| $4.10 | $32.80 | 6-Sep | 12-Sep |
| $12.20 | $61.00 | 8-Aug | 11-Aug |
| $7.33 | $36.65 | 8-Aug | 11-Aug |
| | =SUM(F6:F14) | | |

4. Press **Enter**, and the result will appear.     $450.85

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# Using AutoSum to select common functions

The **AutoSum** command allows you to automatically return the results for a range of cells for common functions like SUM and AVERAGE.

1. Select the cell where the answer will appear (**E24**, for example).

2. Click the **Home** tab.

3. In the **Editing** group, click the **AutoSum** drop-down arrow and select the function you want (**Average**, for example).
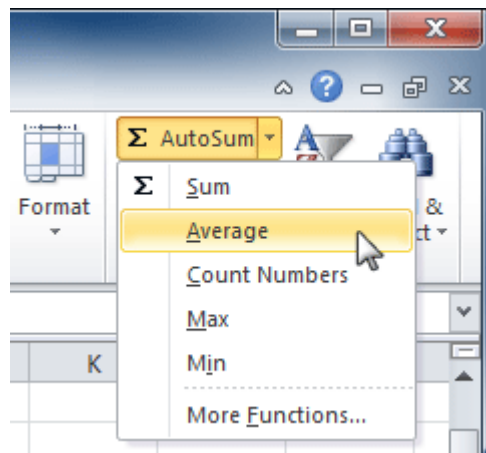


4. A formula will appear in **E24**, the selected cell. If logically placed, AutoSum will select your cells for you. Otherwise, you will need to click the cells to choose the argument you want.

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| Unit Price | Subtotal | Date Ordered | Date Received |
|---|---|---|---|
| $12.03 | $36.09 | 18-Sep | 26-Sep |
| $15.95 | $31.90 | 18-Sep | 26-Sep |
| $5.87 | $58.70 | 8-Aug | 14-Aug |
| $8.83 | $88.30 | 8-Aug | 14-Aug |
| $13.54 | $27.08 | 22-Jul | 29-Jul |
| =AVERAGE(E19:E23) | | | |
| AVERAGE(**number1**, [number2], ...) | | | |
| Subtotal | | | |

5. Press **Enter**, and the result will appear.     $11.24

# The Function Library

There are hundreds of functions in Excel, but only some will be useful for the type of data you're working with. There is no need to learn every single function, but you may want to explore some of the different types to get ideas about which ones might be helpful to you as you create new spreadsheets.

A great place to explore functions is in the **Function Library** on the Formulas tab. Here, you can search and select Excel functions based on categories such as **Financial**, **Logical**, **Text**, and **Date & Time**.
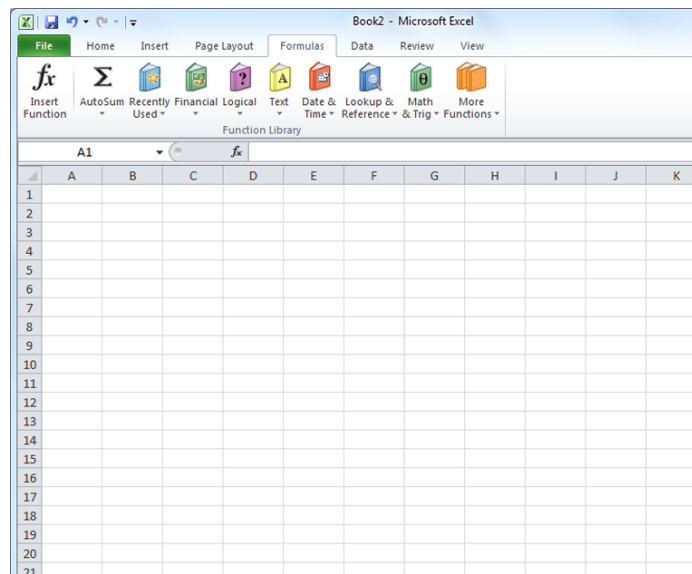
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# To insert a function from the Function Library:

1. Select the cell where the answer will appear (**I6**, for example).

2. Click the **Formulas** tab.

3. From the **Function Library** group, select the **function category** you want. In this example, we'll choose **Date & Time**.

4. Select the desired **function** from the Date & Time drop-down menu. We'll choose the **NETWORKDAYS** function to count the days between the order date and receive date in our worksheet.
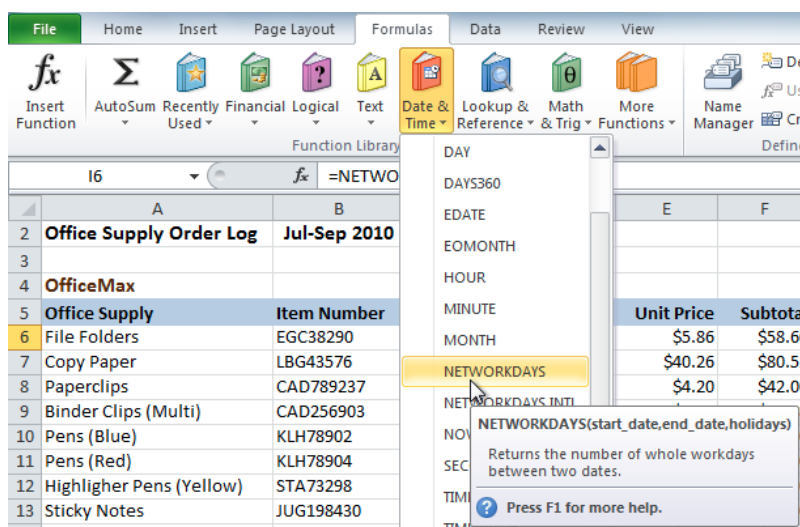
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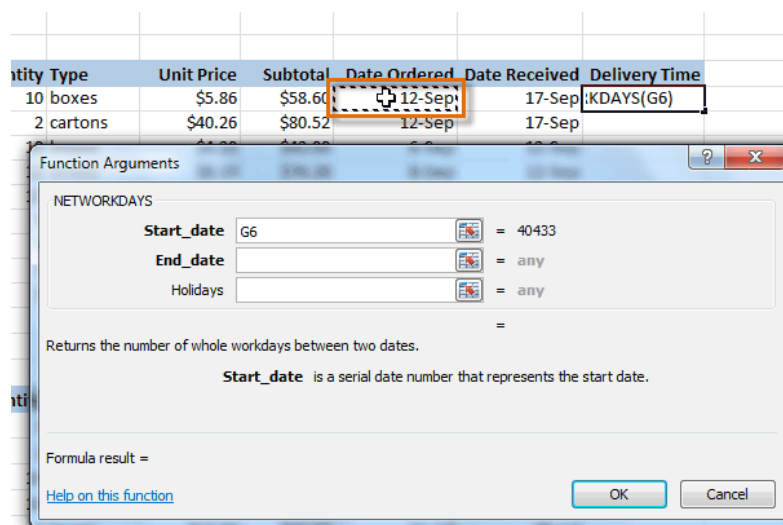**Subject: Computer Applications**

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5. The **Function Arguments** dialog box will appear. Insert the cursor in the **first field**, then enter or select the cell(s) you want (**G6**, for example).



6. Insert the cursor in the **next field**, then enter or select the cell(s) you want (**H6**, for example).

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7. Click **OK**, and the result will appear. Our results show that it took five days to receive the order.



# Excel Formulas You Should Definitely Know

**1.** SUM Formula: =SUM(5, 5) or =SUM(A1, B1) or =SUM(A1:B5)

The SUM formula does exactly what you would expect. It allows you to add 2 or more numbers together. You can use cell references as well in this formula.

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2. COUNT Formula: =COUNT(A1:A10) The count formula counts the number of cells in a range that have numbers in them. It only counts the cells where there are numbers.

3. COUNTA Formula: =COUNTA(A1:A10) Counts the number of non-empty cells in a range. It will count cells that have numbers and/or any other characters in them. The COUNTA Formula works with all data types. It counts the number of non-empty cells no matter the data type.

4. LEN Formula: =LEN(A1) The LEN formula counts the number of characters in a cell. This includes spaces!

# SORTING DATA

With more than 17 billion cells in a single worksheet, Excel 2010 gives you the ability to work with an **enormous amount of data**. Arranging your data alphabetically, from smallest to largest, or using other criteria can help you find the information you're looking for more quickly.

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# To sort in alphabetical order:

1. Select a cell in the column you want to sort by. In this example, we'll sort by **Last Name**.

| | C | D | E |
|---|---|---|---|
| 1 | Last Name | Payment | T-Shirt Color |
| 2 | Olivera | 1-Oct | White |
| 3 | Richards | 4-Oct | Dark Red |
| 4 | Hanlon | 5-Oct | Heather Grey |
| 5 | Means | 5-Oct | Dark Red |

2. Select the **Data** tab, then locate the **Sort and Filter** group.

3. Click the ascending command to **Sort A to Z** or the descending command to **Sort Z to A**.
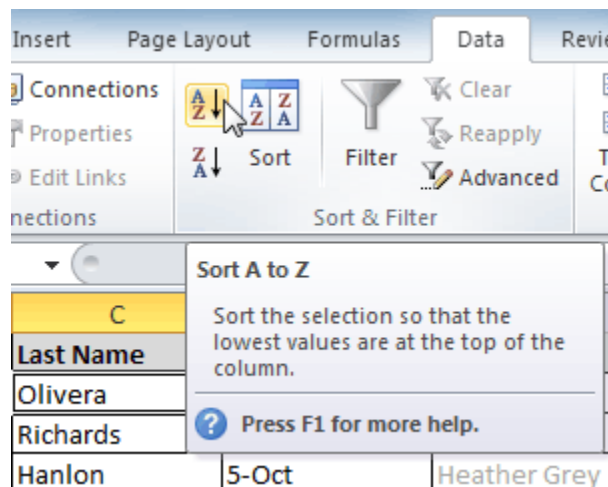
4. The data in the spreadsheet will be organized alphabetically.

| | C | D | E |
|---|---|---|---|
| 1 | Last Name | Payment | T-Shirt Color |
| 2 | Ackerman | 1-Oct | Heather Grey |
| 3 | Albee | 13-Oct | Heather Grey |
| 4 | Bell | 11-Oct | Dark Red |
| 5 | Benson | 11-Oct | White |
| 6 | Chen | 5-Oct | Dark Red |
| 7 | Del Toro | 13-Oct | White |
| 8 | Ellison | Pending | Dark Red |
| 9 | Flores | 6-Oct | White |
| 10 | Hanlon | 5-Oct | Heather Grey |
| 11 | Kelly | 11-Oct | Dark Red |
| 12 | Kelly | 11-Oct | Heather Grey |
| 13 | Lazar | 14-Oct | White |
| 14 | MacDonald | Pending | Dark Red |
| 15 | Means | 5-Oct | Dark Red |
| 16 | Naser | 14-Oct | Dark Red |
| 17 | Nichols | 6-Oct | Dark Red |

Sorting options can also be found on the Home tab, condensed into the **Sort & Filter** command.

# CHARTS

Excel workbooks can contain **a lot of data**, and this data can often be difficult to interpret. For example, where are the highest and lowest values? Are the numbers increasing or decreasing?

The answers to questions like these can become much clearer when data is represented as a **chart**. Excel has various types of charts, so you can choose one that most effectively represents your data.

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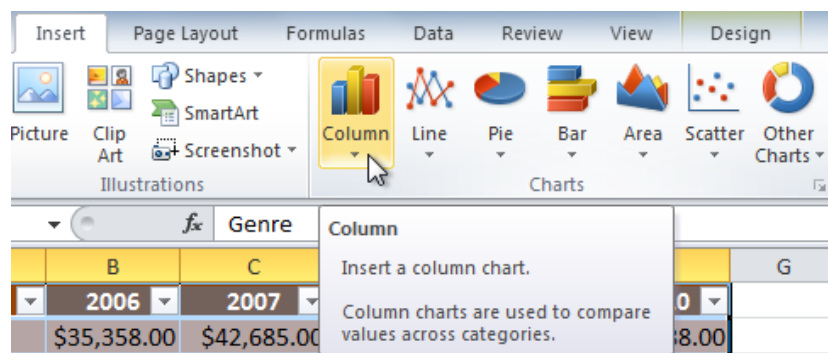**E-mail : rami.qays@mustaqbal-college.edu.iq**

# To create a chart:

1. Select the **cells** you want to chart, including the **column titles** and **row labels**. These cells will be the **source data** for the chart.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Genre | 2006 | 2007 | 2008 | 2009 | 2010 |
| 2 | Young Adult | $35,358.00 | $42,685.00 | $20,893.00 | $16,065.00 | $21,388.00 |
| 3 | Classics | $18,580.00 | $49,225.00 | $16,326.00 | $10,017.00 | $26,134.00 |
| 4 | Mystery | $78,970.00 | $82,262.00 | $48,640.00 | $49,985.00 | $73,428.00 |
| 5 | Romance | $94,236.00 | $131,390.00 | $79,022.00 | $71,009.00 | $81,474.00 |
| 6 | Sci-Fi & Fantasy | $16,730.00 | $19,730.00 | $12,109.00 | $11,355.00 | $17,686.00 |
| 7 | | | | | | |

2. Click the **Insert** tab.

3. In the **Charts** group, select the desired **chart category** (**Column**, for example).

4. Select the desired **chart type** from the drop-down menu (**Clustered Column**, for example).
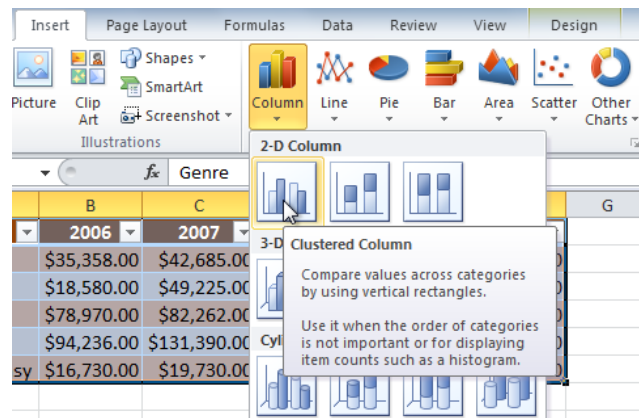
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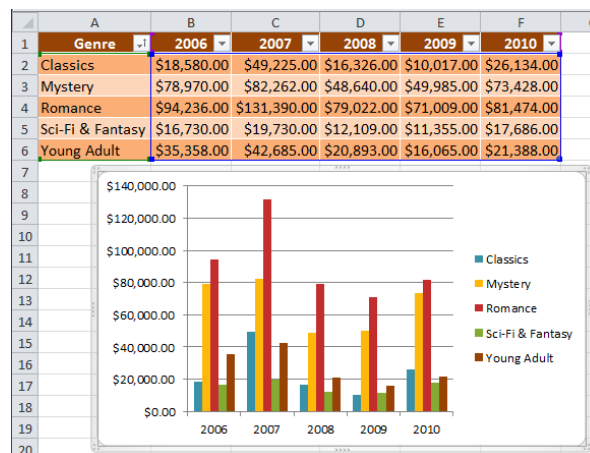**Subject: Computer Applications**

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5. The chart will appear in the worksheet.



# To change chart type:

1. From the **Design** tab, click the **Change Chart Type** command. A dialog box appears.

2. Select the desired **chart type**, then click **OK**.
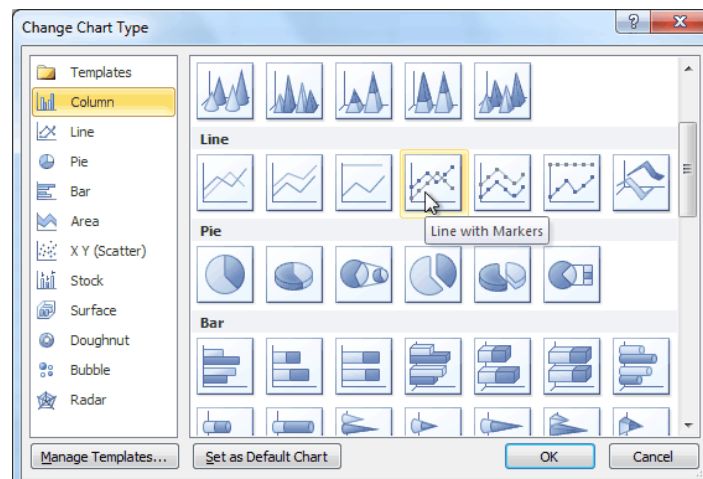


# WHAT–IF ANALYSIS

Excel includes many powerful tools to perform complex mathematical calculations, including **what–if analysis**. This feature can help you **experiment** and **answer questions** with your data, even when the data is incomplete
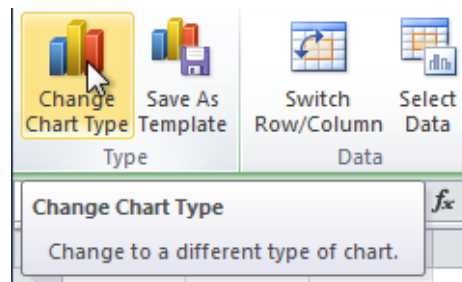
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# Using Goal Seek

When you create a formula or function in Excel, you put various parts together to calculate a **result**. **Goal Seek** works in the opposite way: It lets you start with the **desired result**, and it calculates the **input value** that will give you that result.

## To use Goal Seek

Let's say you're enrolled in a class. You currently have a grade of 65, and you need at least a 70 to pass the class. Luckily, you have one final assignment that might be able to raise your average. You can use Goal Seek to find out **what grade you need on the final assignment** to pass the class.

In the image below, you can see that the grades on the first four assignments are **58**, **70**, **72**, and **60**. Even though we don't know what the fifth grade will be, we can go ahead and write a formula or function that calculates the final grade. In this case, each assignment is weighted equally, so all we have to do is average all five grades by typing =**AVERAGE(B2:B6)**. Once we use Goal Seek, cell **B6** will show us the minimum grade we'll need to make on the final assignment.

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| | SUM | ▼ | ✗ ✓ *fx* | =AVERAGE(B2:B6) | |
|---|---|---|---|---|---|
| | A | B | C | D | |
| 1 | Assignment | Grade | | | |
| 2 | Test 1 | 58 | | | |
| 3 | Paper 1 | 70 | | | |
| 4 | Test 2 | 72 | | | |
| 5 | Paper 2 | 60 | | | |
| 6 | Test 3 | | | | |
| 7 | Final | =AVERAGE(B2:B6) | | | |
| 8 | | | | | |

1. Select the cell containing the value you want to change. When you use Goal Seek, you'll need to select a cell that already contains a **formula** or **function**. In our example, we'll select cell **B7** because it contains the formula **=AVERAGE(B2:B6)**.

| | B7 | ▼ | *fx* | =AVERAGE(B2:B6) | |
|---|---|---|---|---|---|
| | A | B | C | D | |
| 1 | Assignment | Grade | | | |
| 2 | Test 1 | 58 | | | |
| 3 | Paper 1 | 70 | | | |
| 4 | Test 2 | 72 | | | |
| 5 | Paper 2 | 60 | | | |
| 6 | Test 3 | | | | |
| 7 | Final Grade | 65 ⊕ | | | |
| 8 | | | | | |

2. From the **Data** tab, click the **What-If Analysis** command, then select **Goal Seek** from the drop-down menu.



3. A dialog box will appear with three fields:

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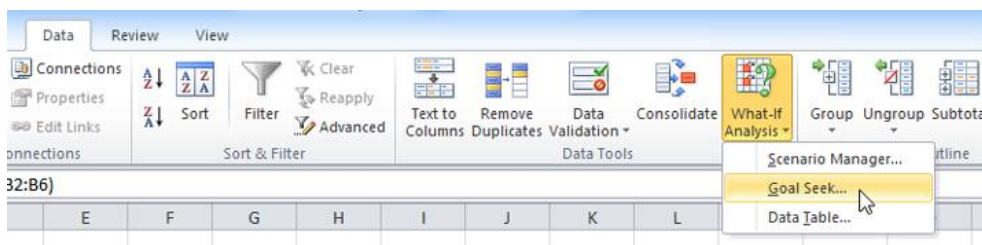
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- o **Set cell:** This is the cell that will contain the desired result. In our example, cell **B7** is already selected.

- o **To value:** This is the desired result. In our example, we'll enter **70** because we need to earn at least that to pass the class.

- o **By changing cell:** This is the cell where Goal Seek will place its answer. In our example, we'll select cell **B6** because we want to determine the grade we need to earn on the final assignment.

4. When you're done, click **OK**.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Assignment | Grade | | | |
| 2 | Test 1 | 58 | | | |
| 3 | Paper 1 | 70 | | | |
| 4 | Test 2 | 72 | | | |
| 5 | Paper 2 | 60 | | | |
| 6 | Test 3 | | | | |
| 7 | Final Grade | 65 | | | |

Goal Seek

Set cell: B7

To value: 70

By changing cell: $B$6

OK    Cancel

5. The dialog box will tell you if Goal Seek was able to find a solution. Click **OK**.

Goal Seek Status

Goal Seeking with Cell B7 found a solution.

Step

Pause

Target value:   70
Current value:   70

OK    Cancel