While doing Data Analysis, referring to various data will be more meaningful and easy if the reference is by Names rather than cell references – either a single cell or a range of cells. For example, if you are calculating Net Present Value based on a Discount Rate and a series of Cash Flows, the formula

Net_Present_Value = NPV (Discount_Rate, Cash_Flows)

is more meaningful than

C10 = NPV (C2, C6:C8)

With Excel, you can create and use meaningful names to various parts of your data. The advantages of using range names include –

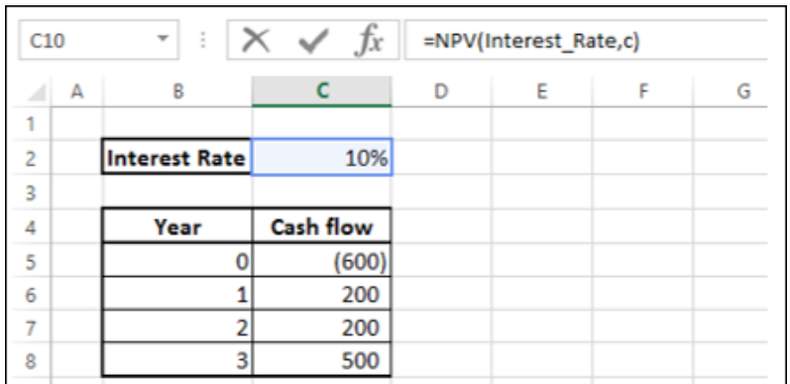
- A meaningful Range name (such as Cash_Flows) is much easier to remember than a Range address (such as C6:C8).
- Entering a name is less error prone than entering a cell or range address.
- If you type a name incorrectly in a formula, Excel will display a **#NAME?** error.
- You can quickly move to areas of your worksheet by using the defined names.
- With Names, your formulas will be more understandable and easier to use. For example, a formula Net_Income = Gross_Income – Deductions is more intuitive than C40 = C20 – B18.
- Creating formulas with range names is easier than with cell or range addresses. You can copy a cell or range name into a formula by using formula Autocomplete.

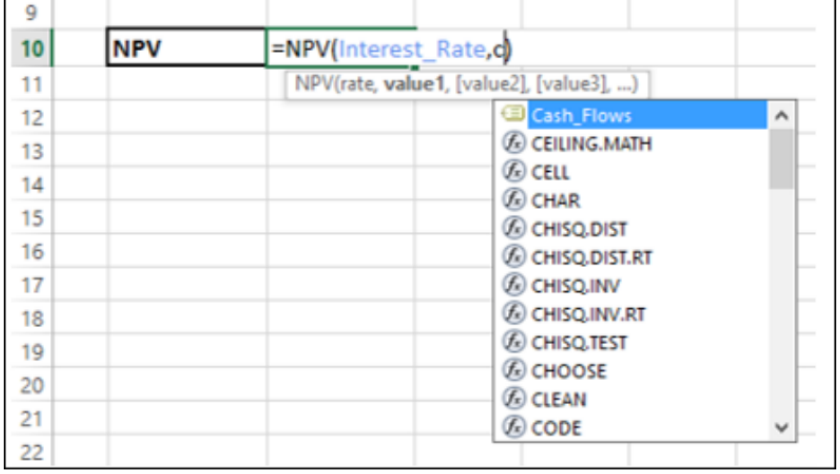
In this chapter, you will learn −

- Syntax rules for names.
- Creating names for cell references.
- Creating names for constants.
- Managing the names.
- Scope of your defined names.
- Editing names.
- Filtering names.
- Deleting names.
- Applying names.
- Using names in a formula.
- Viewing names in a workbook.
- Using paste names and paste list.
- Using names for range intersections.
- Copying formulas with names.

Copying Name using Formula Autocomplete

Type the first letter of the name in the formula. A drop-down box appears with function names and range names. Select the required name. It is copied into your formula.





Range Name Syntax Rules

Excel has the following syntax rules for names −

- You can use any combination of letters, numbers and the symbols - underscores, backslashes, and periods. Other symbols are not allowed.
- A name can begin with a character, underscore or backslash.
- A name cannot begin with a number (example - 1stQuarter) or resemble a cell address (example - QTR1).
- If you prefer to use such names, precede the name with an underscore or a backslash (example - \1stQuarter, _QTR1).
- Names cannot contain spaces. If you want to distinguish two words in a name, you can use underscore (example- Cash_Flows instead of Cash Flows)
- Your defined names should not clash with Excel's internally defined names, such as **Print_Area, Print_Titles, Consolidate_Area, and Sheet_Title**. If you define the same names, they will override the Excel's internal names and you will not get any error message. However, it is advised not to do so.
- Keep the names short but understandable, though you can use up to 255 characters

Creating Range Names

You can create Range Names in two ways −

- Using the **Name box**.
- Using the **New Name** dialog box.
- Using the **Selection** dialog box.

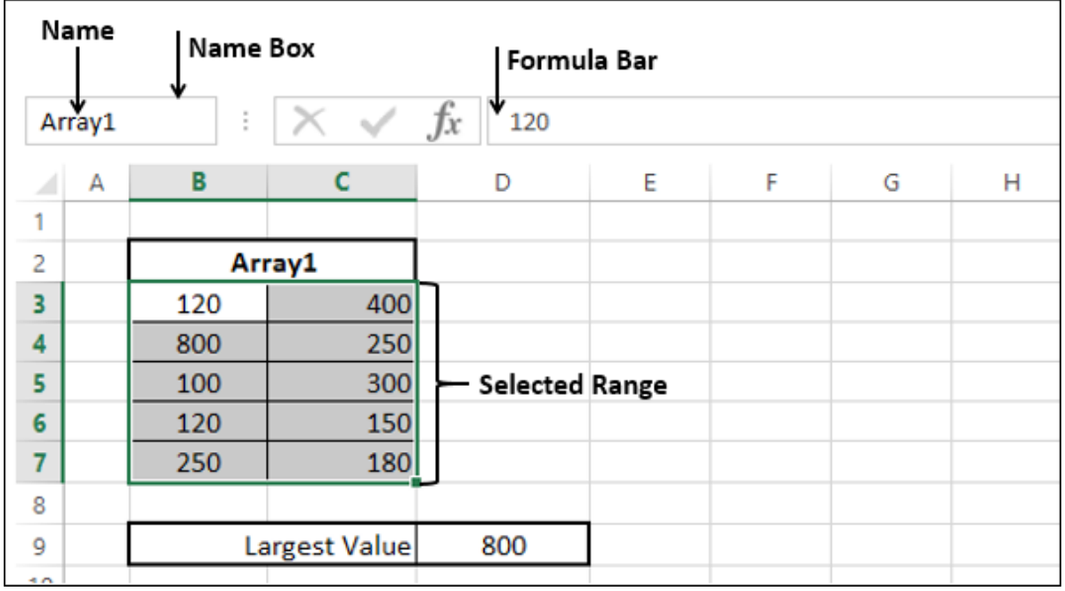
Create a Range Name using the Name Box

To create a Range name, using the **Name** box that is to the left of formula bar is the fastest way. Follow the steps given below −

Step 1 − Select the range for which you want to define a Name.

Step 2 − Click on the Name box.

Step 3 − Type the name and press Enter to create the Name.



Create a Range Name using the New Name dialog box

You can also create Range Names using the New Name dialog box from Formulas tab.

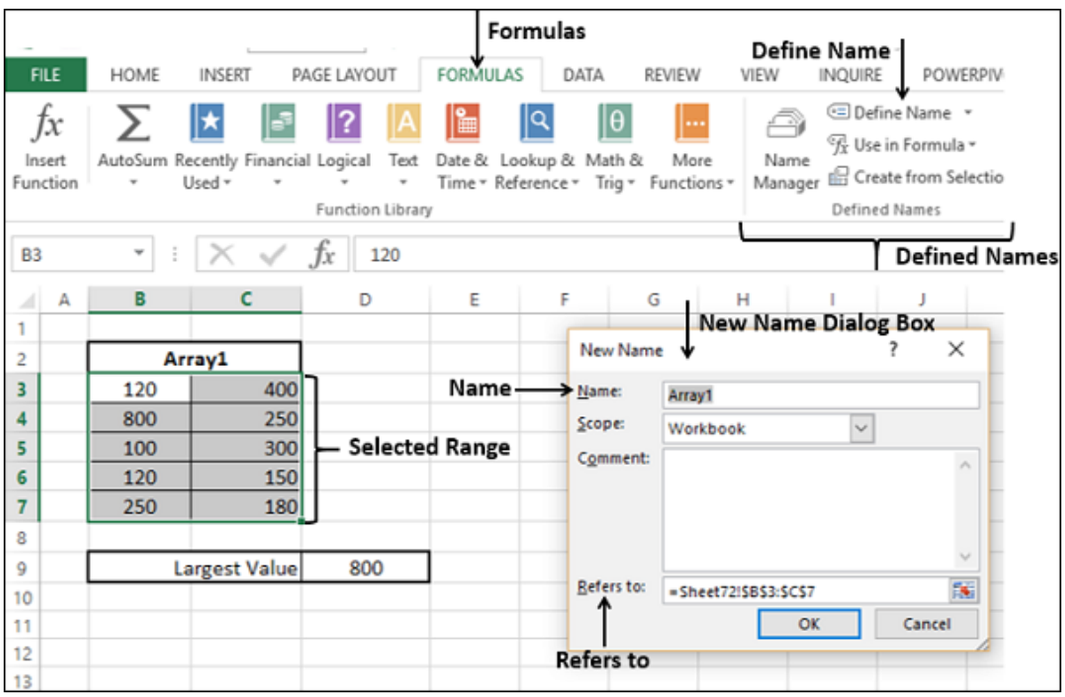
Step 1 – Select the range for which you want to define a name.

Step 2 – Click the Formulas tab.

Step 3 – Click Define Name in the Defined Names group. The **New Name** dialog box appears.

Step 4 – Type the name in the box next to Name

Step 5 – Check that the range that is selected and displayed in the Refers box is correct. Click OK.



Create a Range Name using the Create Names from Selection dialog box

You can also create Range names using the **Create Names** from the Selection dialog box from Formulas tab, when you have Text values that are adjacent to your range.

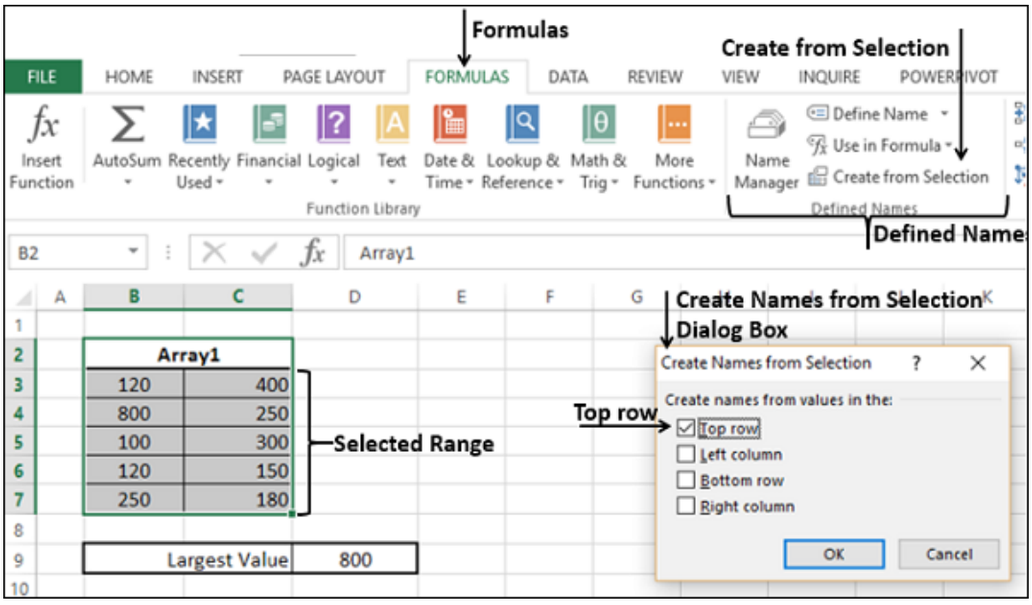
Step 1 – Select the range for which you want to define a name along with the row / column that contains the name.

Step 2 – Click the Formulas tab.

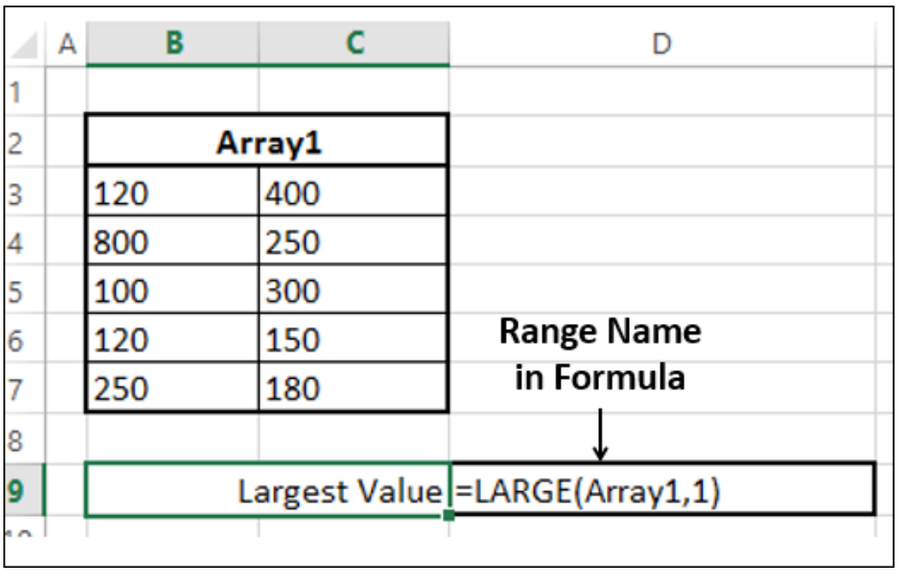
Step 3 – Click **Create from Selection** in the Defined Names group. The **Create Names from Selection** dialog box appears.

Step 4 – Select top row as the Text appears in the top row of the selection.

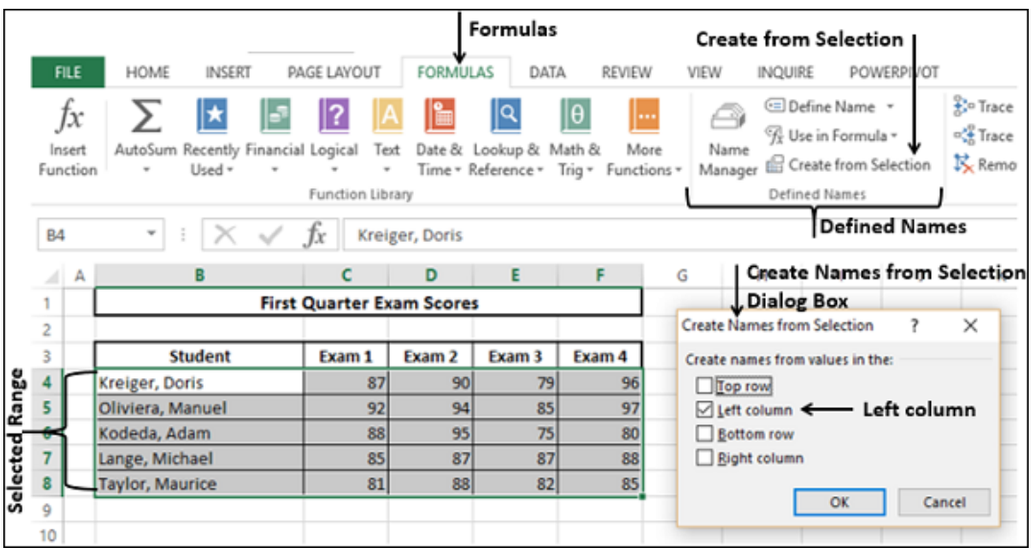
Step 5 – Check the range that got selected and displayed in the box next to Refers to be correct. Click OK.



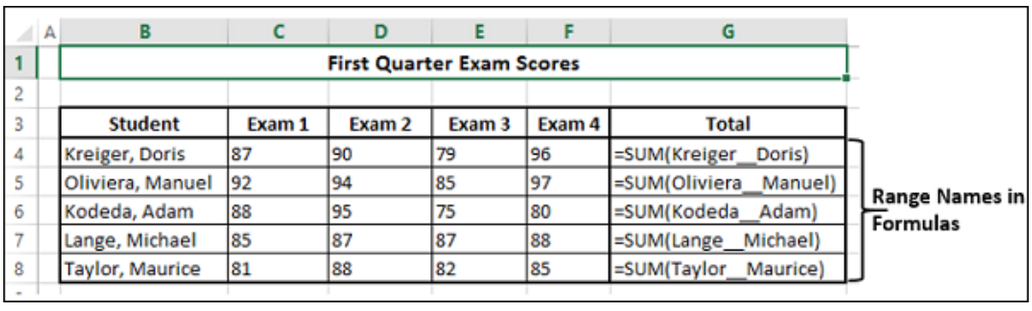
Now, you can find the largest value in the range with =**Sum**(Student Name), as shown below –



You can create names with multiple selection also. In the example given below, you can name the row of marks of each student with the student's name.



Now, you can find the total marks for each student with =**Sum** (student name), as shown below.

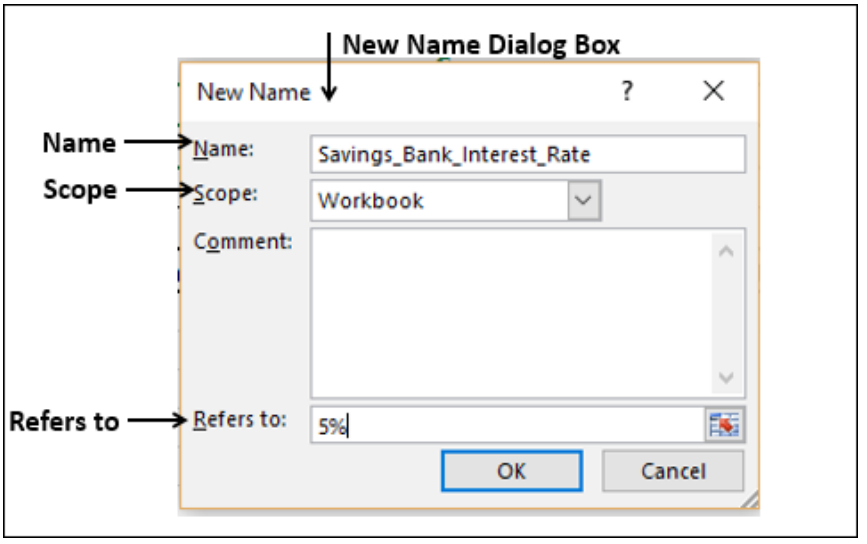


Creating Names for Constants

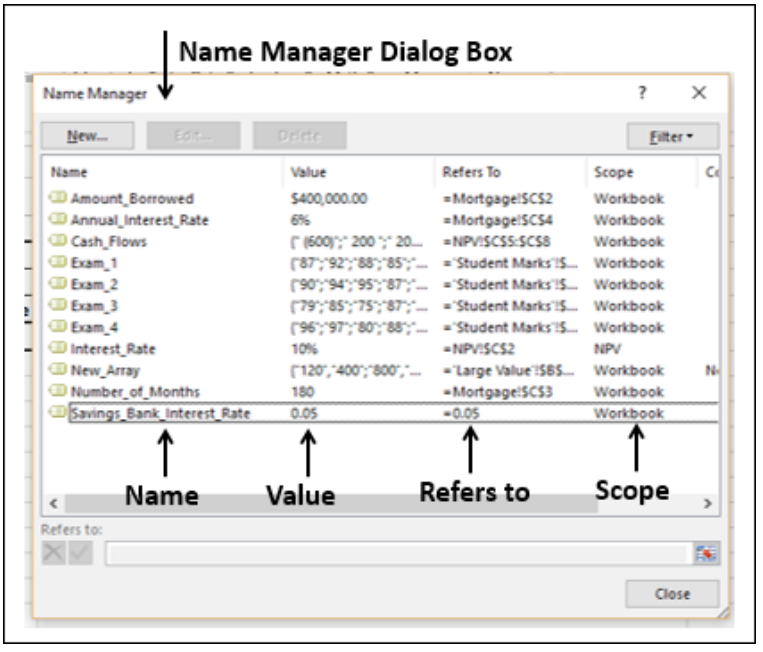
Suppose you have a constant that will be used throughout your workbook. You can assign a name to it directly, without placing it in a cell.

In the example below, Savings Bank Interest Rate is set to 5%.

- Click Define Name.
- In the New Name dialog box, type Savings_Bank_Interest_Rate in the Name box.
- In Scope, select Workbook.
- In Refers to box, clear the contents and type 5%.
- Click OK.



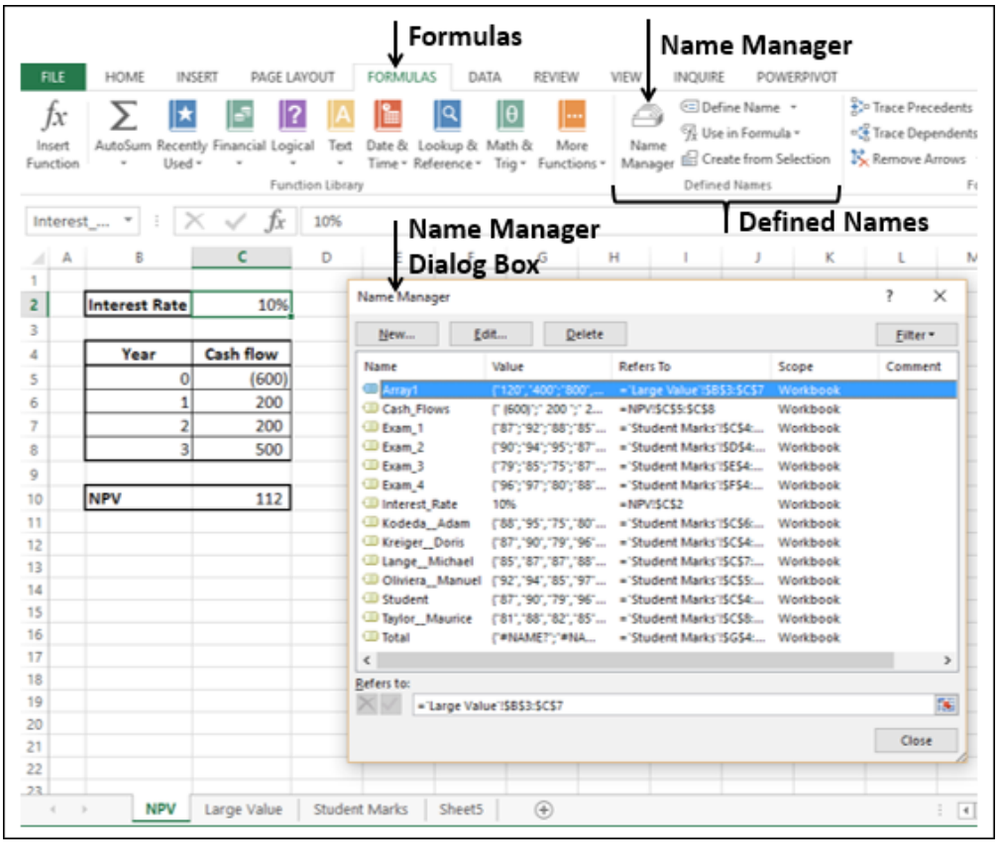
The Name **Savings_Bank_Interest_Rate** is set to a constant 5%. You can verify this in Name Manager. You can see that the value is set to 0.05 and in the **Refers to** =0.05 is placed.



Managing Names

An Excel Workbook can have any number of named cells and ranges. You can manage these names with the Name Manager.

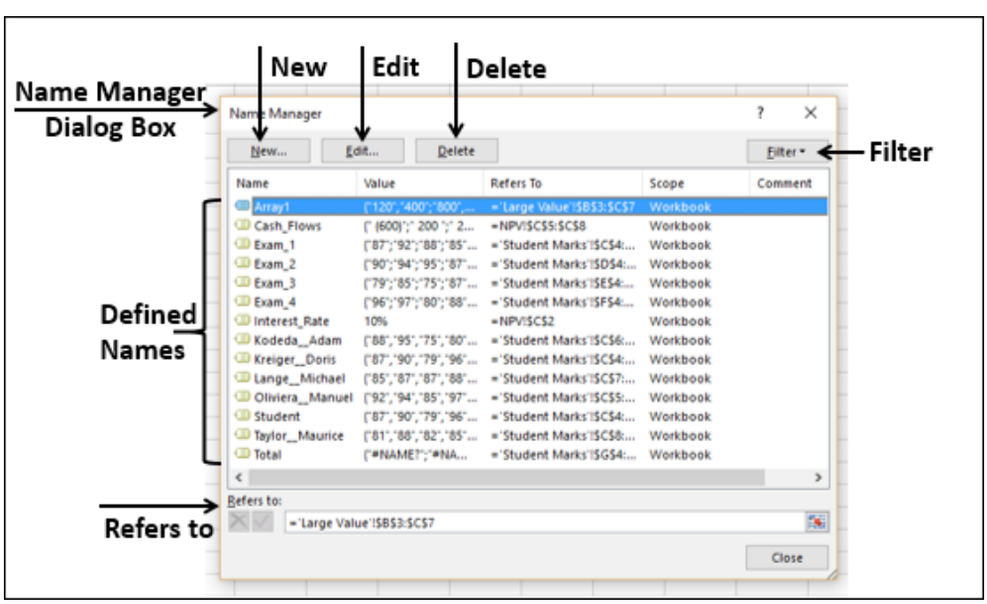
- Click the Formulas tab.
- Click **Name Manager** in the **Defined Names** group. The **Name Manager** dialog box appears. All the names defined in the current workbook are displayed.



The List of **Names** are displayed with the defined **Values, Cell Reference** (including Sheet Name), **Scope** and **Comment**.

The Name Manager has the options to −

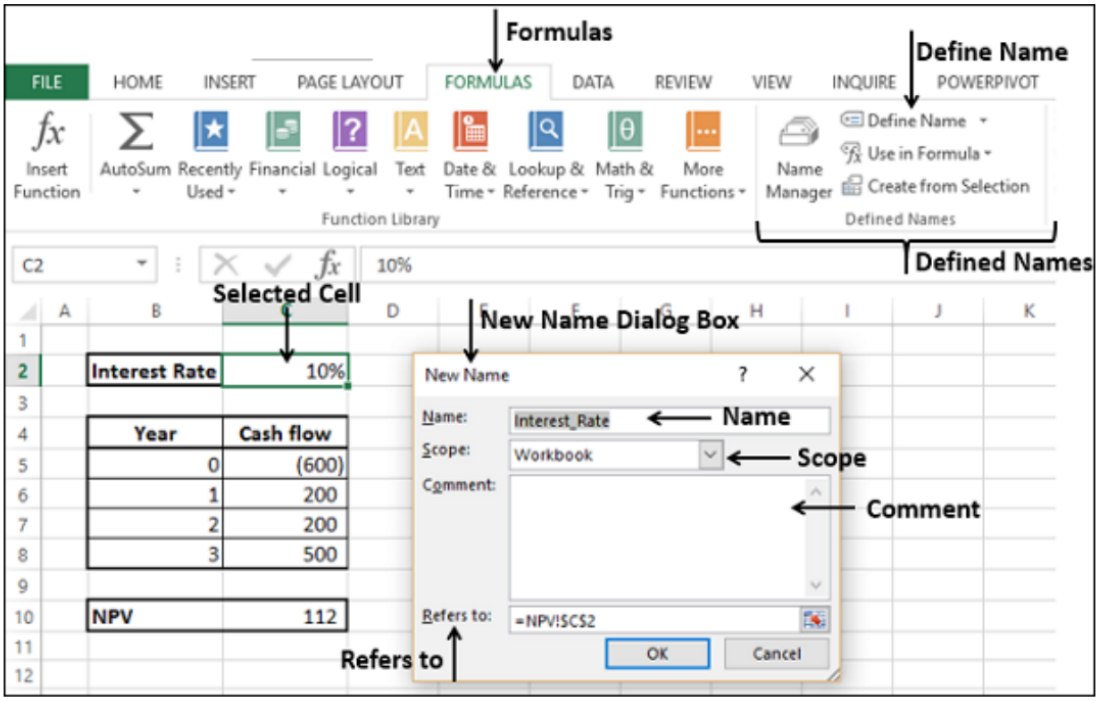
- Define a **New** Name with the **New** Button.
- **Edit** a Defined Name.
- **Delete** a Defined Name.
- **Filter** the Defined Names by Category.
- Modify the Range of a Defined Name that it **Refers to**.



Scope of a Name

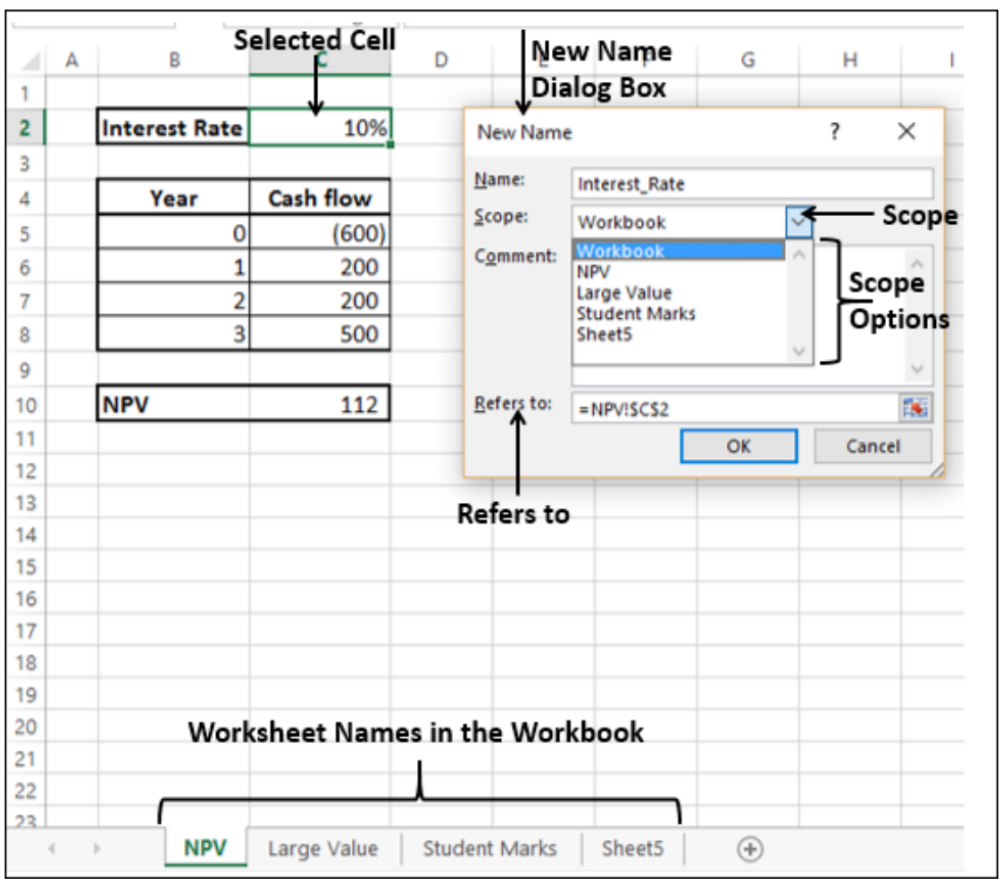
The **Scope** of a name by default is the workbook. You can find the **Scope** of a defined names from the list of names under the **Scope** column in the **Name Manager**.

You can define the **Scope** of a **New Name** when you define the name using **New Name** dialog box. For example, you are defining the name Interest_Rate. Then you can see that the **Scope** of the **New Name** Interest_Rate is the **Workbook**.



Suppose you want the **Scope** of this interest rate restricted to this **Worksheet** only.

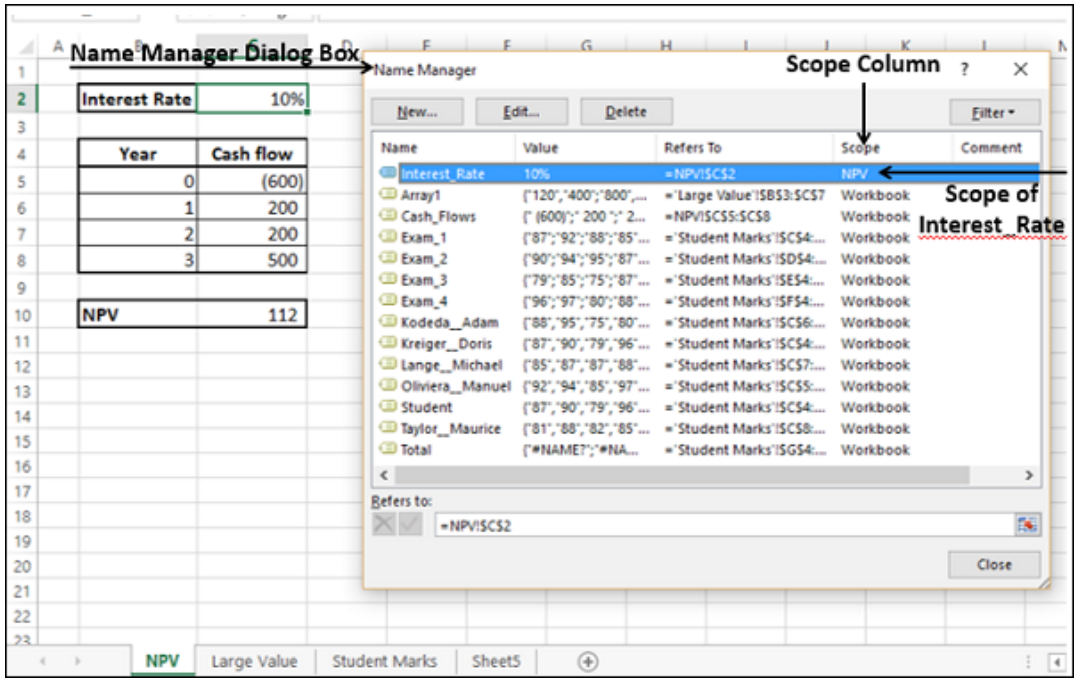
Step 1 − Click the down-arrow in the Scope Box. The available Scope options appear in the drop-down list.



The Scope options include **Workbook**, and the sheet names in the workbook.

Step 2 − Click the current worksheet name, in this case NPV and click OK. You can define / find the sheet name in the worksheet tab.

Step 3 − To verify that Scope is worksheet, click **Name Manager**. In the Scope column, you will find NPV for Interest_Rate. This means you can use the Name Interest_Rate only in the Worksheet NPV, but not in the other Worksheets.



Note − Once you define the Scope of a Name, it cannot be modified later.

Deleting Names with Error Values

Sometimes, it may so happen that Name definition may have errors for various reasons. You can delete such names as follows −

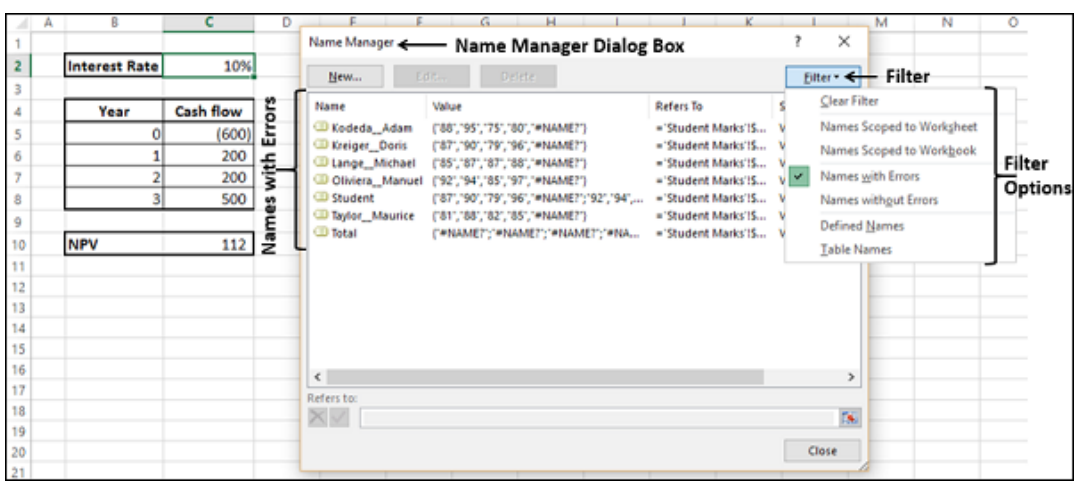
Step 1 − Click **Filter** in the **Name Manager** dialog box.

The following filtering options appear −

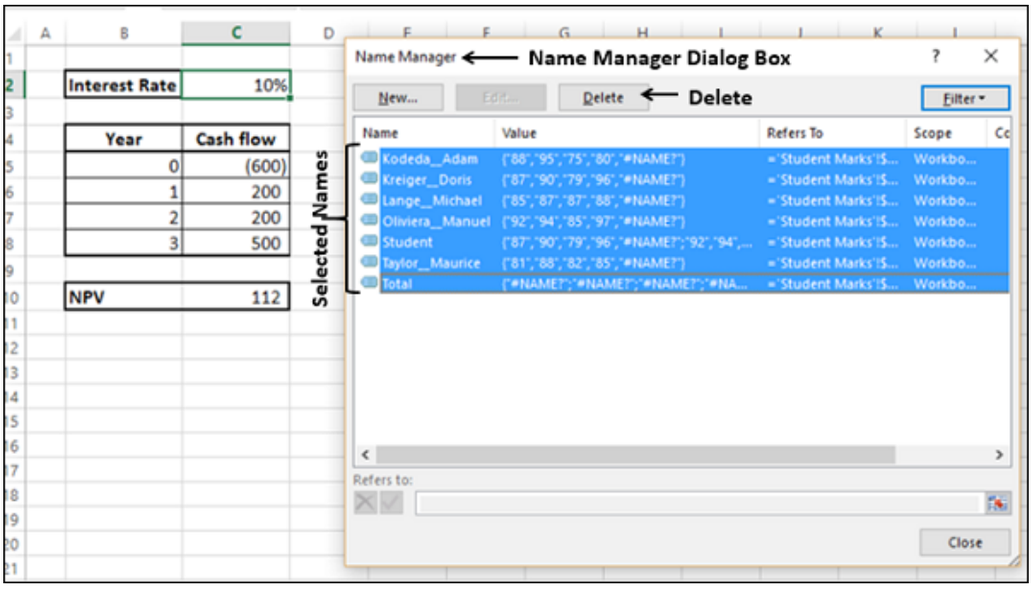
- Clear Filter
- Names Scoped to Worksheet
- Names Scoped to Workbook
- Names with Errors
- Names without Errors
- Defined Names
- Table Names

You can apply **Filter** to the **defined Names** by selecting one or more of these options.

Step 2 − Select **Names with Errors**. Names that contain error values will be displayed.



Step 3 − From the obtained list of **Names**, select the ones you want to delete and click **Delete**.



You will get a message, confirming delete. Click OK.

Editing Names

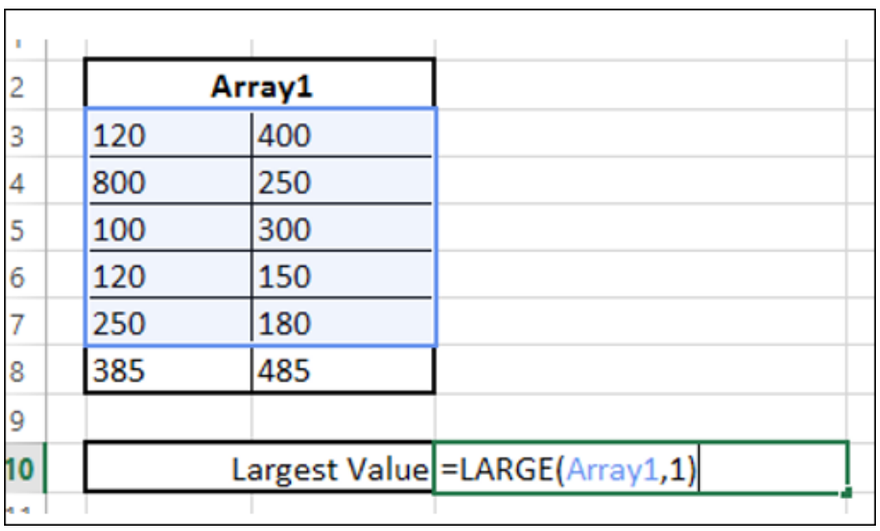
You can use the **Edit** option in the **Name Manager** dialog box to −

- Change the **Name**.
- Modify the **Refers to** range
- Edit the **Comment** in a **Name**.

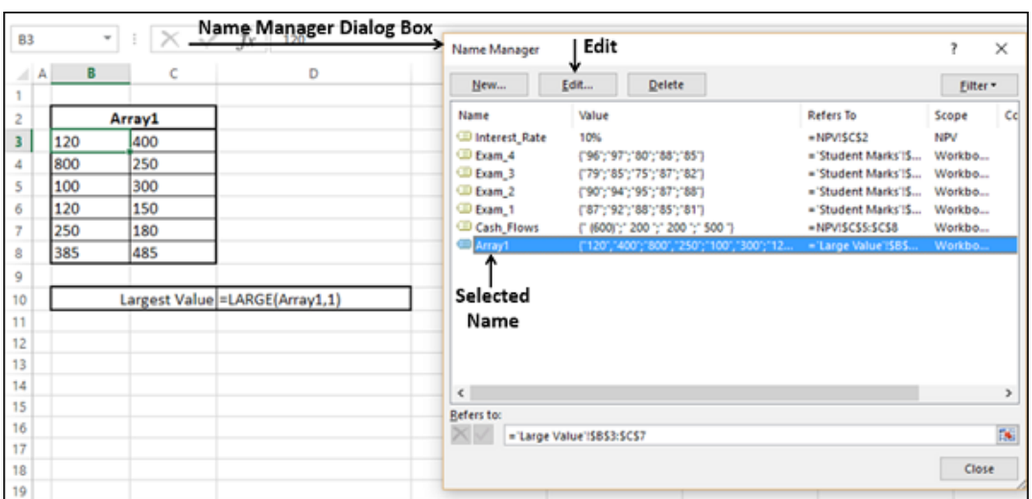
Change the Name

Step 1 − Click the cell containing the function **Large**.

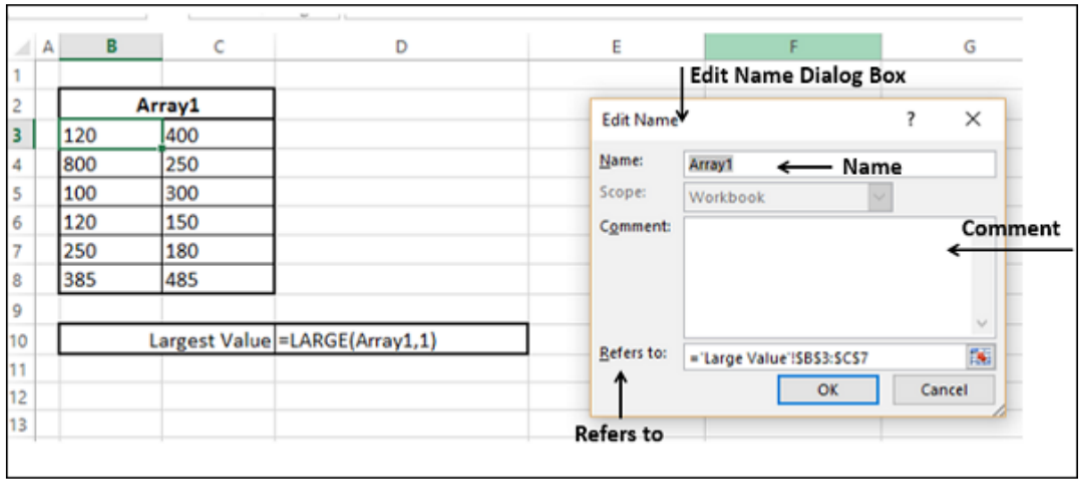
You can see, two more values are added in the array, but are not included in the function as they are not part of Array1.



Step 2 − Click the **Name** you want to edit in the **Name Manager** dialog box. In this case, **Array1**.



Step 3 − Click **Edit**. The **Edit Name** dialog box appears.

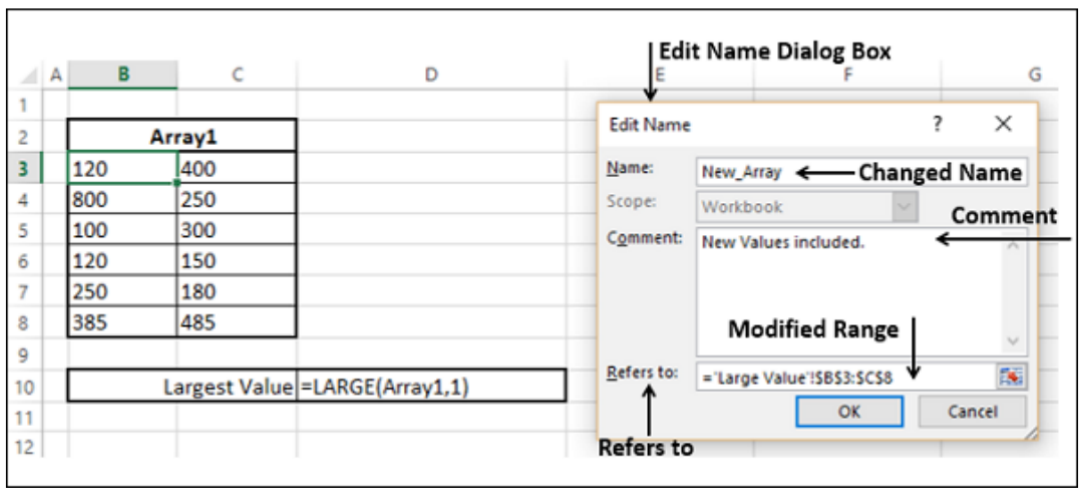


Step 4 − Change the **Name** by typing the new name that you want in the **Name Box**.

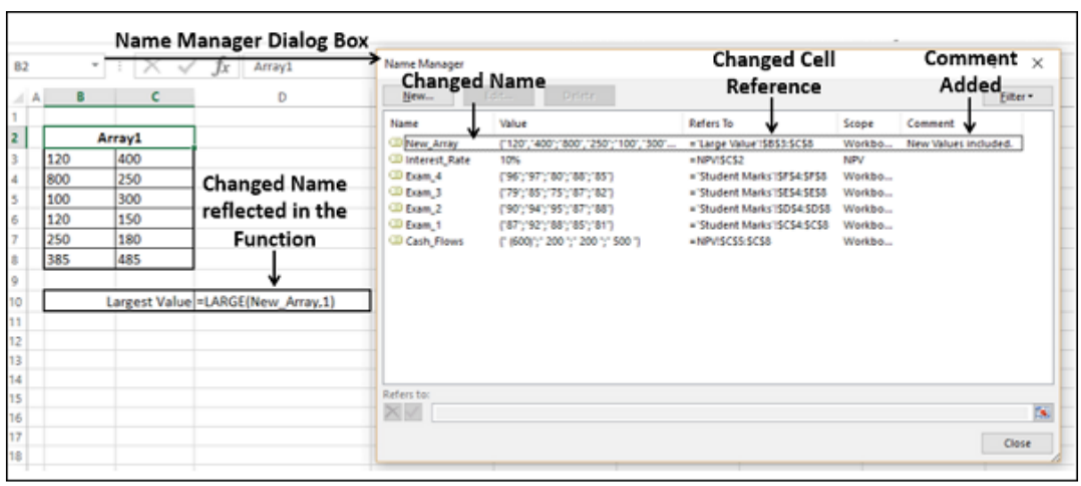
Step 5 − Click the **Range** button to the right of **Refers to** Box and include the new cell references.

Step 6 − Add a **Comment** (Optional)

Notice that **Scope** is deactive and hence cannot be changed.



Click OK. You will observe the changes made.



Applying Names

Consider the following example −

	A	B	C
13			
14		Amount Borrowed	400000
15		Number of Months	180
16		Annual Interest Rate	0.06
17		Monthly Payment	=-PMT(C16/12,C15,C14)

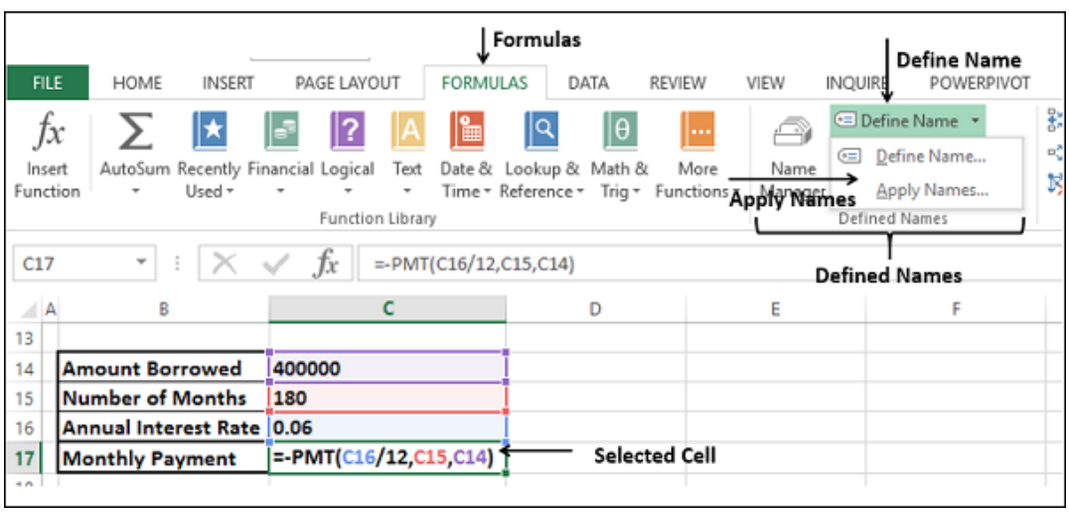
As you observe, names are not defined and used in PMT function. If you place this function somewhere else in the worksheet, you also need to remember where exactly the parameter values are. You know that using names is a better option.

In this case, the function is already defined with cell references that do not have names. You can still define names and apply them.

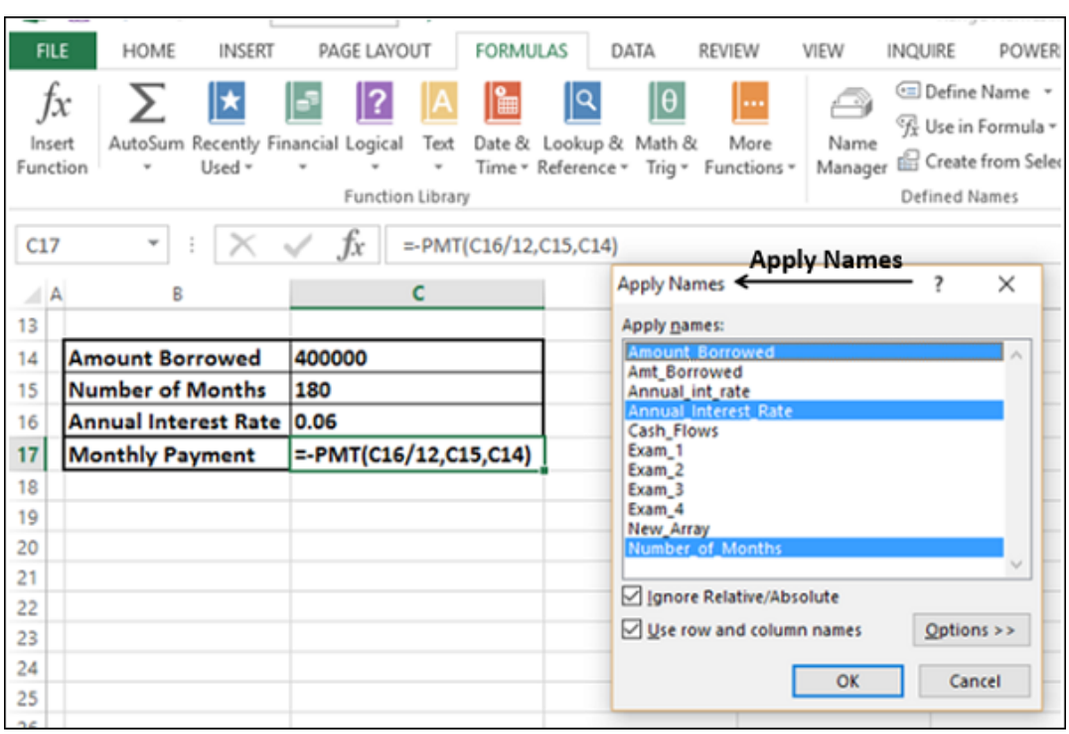
Step 1 − Using **Create from Selection**, define the names.

Step 2 − Select the cell containing the formula. Click next to **Define Name** in the **Defined Names** group on the **Formulas** tab.

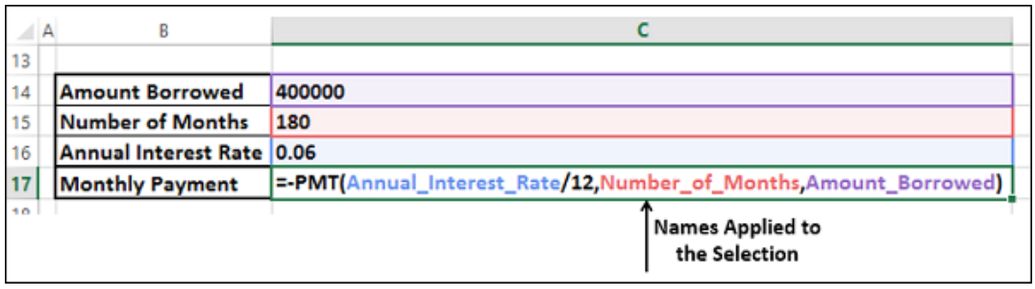
From the drop-down list, click **Apply Names**.



Step 3 − The **Apply Names** dialog box appears. Select the **Names** that you want to **Apply** and click OK.



The selected names will be applied to the selected cells.

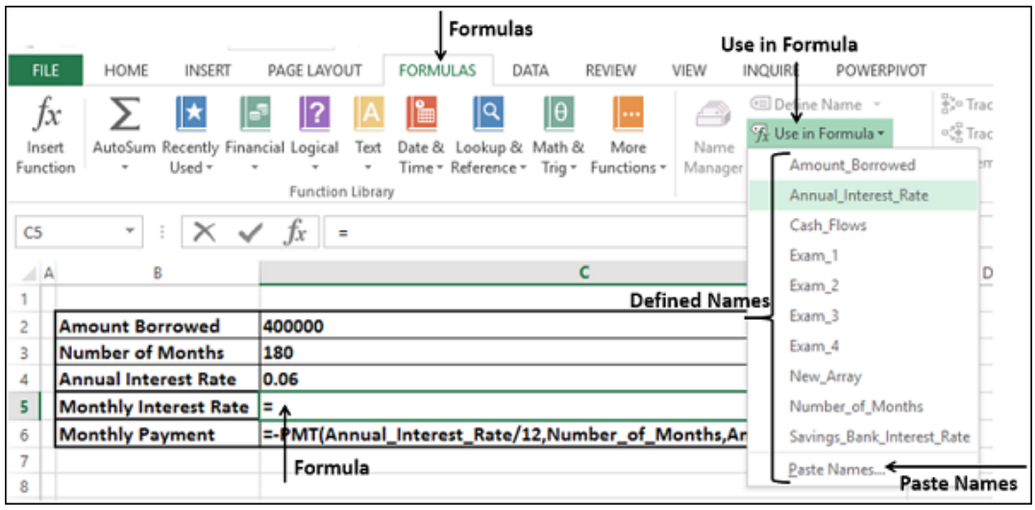


You can also **Apply Names** to an entire worksheet, by selecting the worksheet and repeating the above steps.

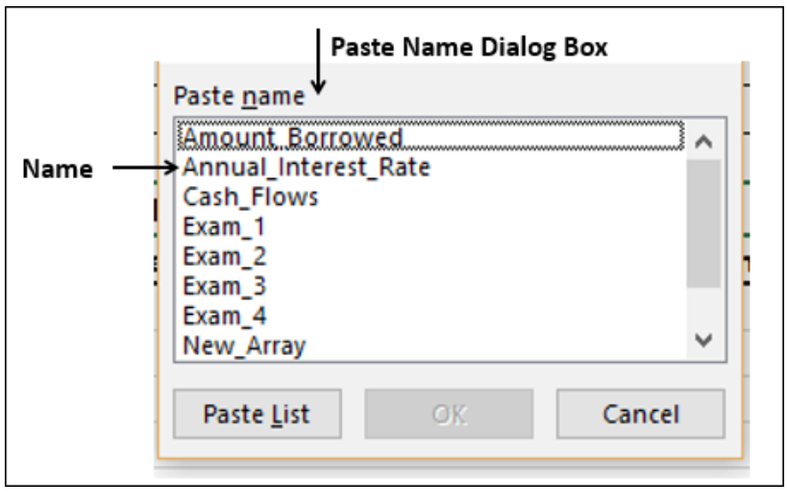
Using Names in a Formula

You can use a **Name** in a **Formula** in the following ways –

- Typing the **Name** if you remember it, or
- Typing first one or two letters and using the **Excel Formula Autocomplete** feature.
- Clicking Use in Formula in the Defined Names group on the Formulas tab.
  - Select the required Name from the drop-down list of defined names.
  - Double-click on that name.



- Using the **Paste Name** dialog box.
  - Select the Paste Names option from the drop-down list of defined names. The Paste Name dialog box appears.
  - Select the **Name** in the **Paste Names** dialog box and double-click it.

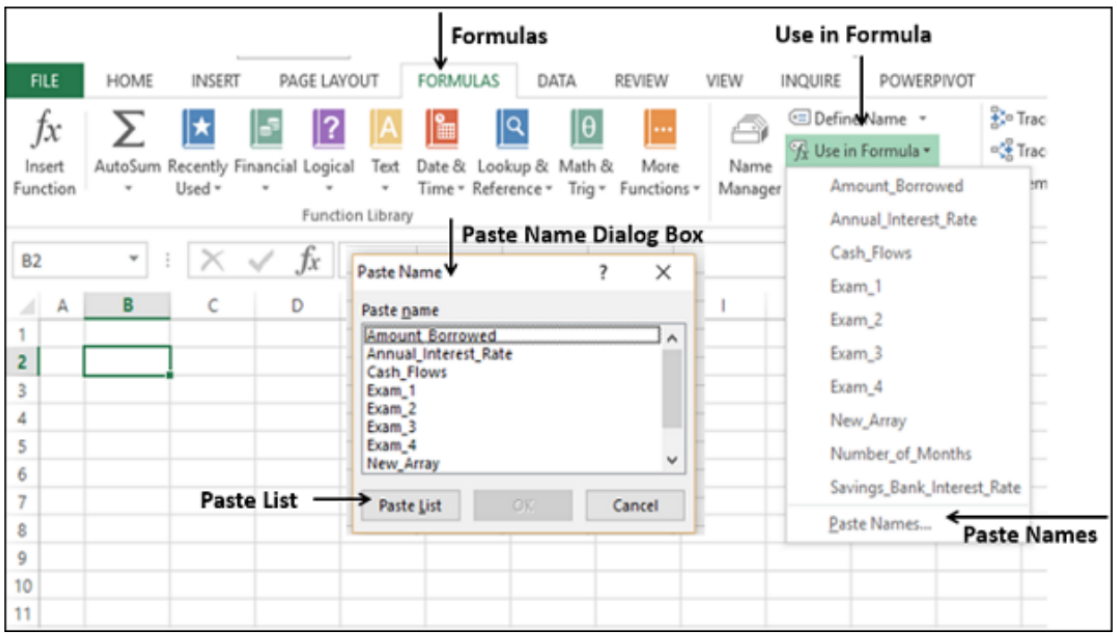


Viewing Names in a Workbook

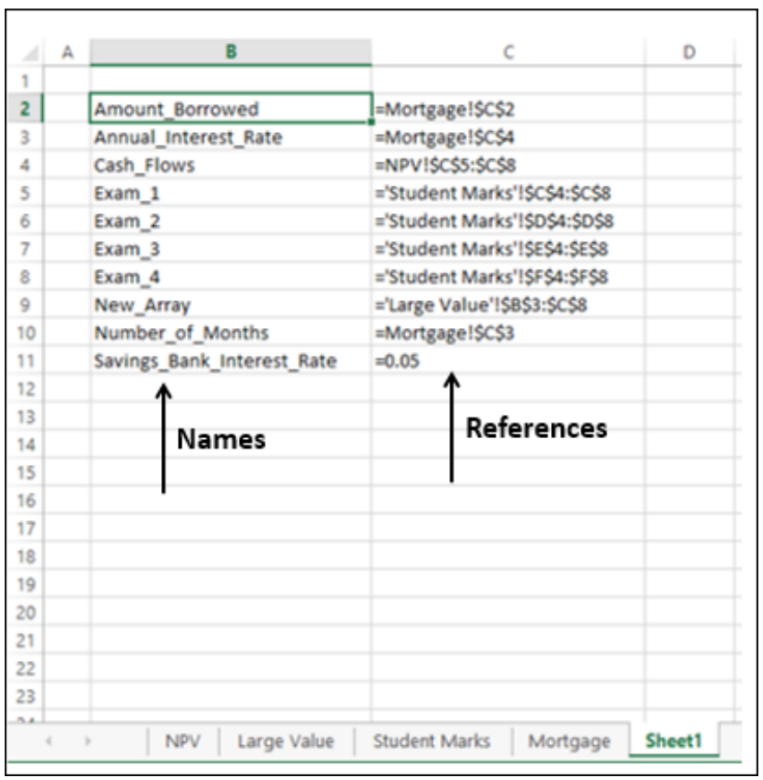
You can get all the **Names** in your workbook along with their **References** and **Save** them or **Print** them.

- Click an empty Cell where you want to copy the **Names** in your workbook.

- Click **Use in Formula** in the **Defined Names** group.
- Click **Paste Names** from the drop-down list.
- Click **Paste List** in the **Paste Name** dialog box that appears.



The list of names and their corresponding references are copied at the specified location on your worksheet as shown in the screen shot given below −



Using Names for Range Intersections

Range Intersections are those individual cells that have two Ranges in common.

For example, in the data given below, the Range B6:F6 and the Range C3:C8 have Cell C6 in common, which actually represents the marks scored by the student Kodeda, Adam in Exam 1.

	A	B	C	D	E	F
1		First Quarter Exam Scores				
2						
3		Student	Exam 1	Exam 2	Exam 3	Exam 4
4		Kreiger, Doris	87	90	79	96
5		Oliviera, Manuel	92	94	85	97
6		Kodeda, Adam	88	95	75	80
7		Lange, Michael	85	87	87	88
8		Taylor, Maurice	81	88	82	85

Intersection of Ranges B6:F6 and C3:C8 = C6

You can make this more meaningful with the **Range Names**.

- Create **Names** with **Create from Selection** for both Students and Exams.
- Your **Names** will look as follows −

Created Names and their Cell References

	A	B	C	D	E	F	G	H	I
1		First Quarter Exam Scores							
2									
3		Student	Exam 1	Exam 2	Exam 3	Exam 4		Exam_1	=Marks!$C$4:$C$8
4		Kreiger, Doris	87	90	79	96		Exam_2	=Marks!$D$4:$D$8
5		Oliviera, Manuel	92	94	85	97		Exam_3	=Marks!$E$4:$E$8
6		Kodeda, Adam	88	95	75	80		Exam_4	=Marks!$F$4:$F$8
7		Lange, Michael	85	87	87	88		Kodeda__Adam	=Marks!$C$6:$F$6
8		Taylor, Maurice	81	88	82	85		Kreiger__Doris	=Marks!$C$4:$F$4
9								Lange__Michael	=Marks!$C$7:$F$7
10								Oliviera__Manuel	=Marks!$C$5:$F$5
11								Taylor__Maurice	=Marks!$C$8:$F$8

- Type =**Kodeda_Adam Exam_1** in B11.

Here, you are using the Range Intersection operation, space between the two ranges.

	A	B	C	D	E	F	G
1		First Quarter Exam Scores					
2							
3		Student	Exam 1	Exam 2	Exam 3	Exam 4	
4		Kreiger, Doris	87	90	79	96	
5		Oliviera, Manuel	92	94	85	97	
6		Kodeda, Adam	88	95	75	80	
7		Lange, Michael	85	87	87	88	
8		Taylor, Maurice	81	88	82	85	
9							
10							
11		=Kodeda__Adam Exam_1					
12							

This will display marks of Kodeda, Adam in Exam 1, that are given in Cell C6.

	A	B	C	D	E	F
1		First Quarter Exam Scores				
2						
3		Student	Exam 1	Exam 2	Exam 3	Exam 4
4		Kreiger, Doris	87	90	79	96
5		Oliviera, Manuel	92	94	85	97
6		Kodeda, Adam	88	95	75	80
7		Lange, Michael	85	87	87	88
8		Taylor, Maurice	81	88	82	85
9						
10						
11		88				
12						

Copying Formulas with Names

You can copy a formula with names by **Copy**and **Paste** within the same worksheet.

You can also copy a formula with names to a different worksheet by **copy** and **paste**, provided all the **names** in the **formula** have **workbook** as **Scope**. Otherwise, you will get a **#VALUE** error.