

PROFESSIONAL EMPLOYERS PRIVATE LIMITED

# EXCEL TRAINING MANUAL

*PREPARED BY: AIMAN SALEEM*



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## NOTES

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Prepared by: Aiman Saleem



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# 1. INTRODUCTION TO EXCEL

Microsoft Excel gives businesses the tools they need to make the most of their data. And when it comes to making the most of resources, and maximizing return on investment, this is becoming increasingly important. Firms are collecting ever-greater volumes of data from multiple sources, including in-store-transactions, online sales and social media. They need to be able to collate and analyze this information quickly and effectively.

Excel spreadsheets are commonly used across business to display financial information and other data relevant to the running of the business. This could be information relevant to the customer relationship management department, sales, marketing or HR. With so many business functions now reliant on IT and the internet, Excel continues to be seen as a vital tool for administration and the effective running of a business.

- Excel is a computer program used to create electronic spreadsheets.
- Within excel user can organize data, create chart and perform calculations.
- Excel is a convenient program because it allow user to create large spreadsheets, reference information, and it allows for better storage of information.
- Excels operates like other Microsoft (MS) office programs and has many of the same functions and shortcuts of other MS programs.

## 1.1 WHAT IS A SPREADSHEET?

A spreadsheet is the computerized equivalent of a general ledger. It has taken the place of the pencil, paper, and calculator. Spreadsheet programs were first developed for accountants but have now been adopted by anyone wanting to prepare a budget, forecast sales data, create profit and loss statements, and compare financial alternatives and any other mathematical applications requiring calculations.

The electronic spreadsheet is laid out similar to the paper ledger sheet in that it is divided into columns and rows. Any task that can be done on paper can be performed on an electronic spreadsheet faster and more accurately.

The problem with manual sheets is that if any error is found within the data, all answers must be erased and recalculated manually. With the computerized spreadsheet, formulas can be written that are automatically updated whenever the data are changed.

## **1.2 WHAT CAN A SPREADSHEET DO?**

In contrast to a word processor, which manipulates text, a spreadsheet manipulates numerical data and text. Using a spreadsheet, one can create budgets, analyze data, produce financial plans, and perform various other simple and complex numerical applications.

By having formulas that automatically recalculate, either built by you, the user, or the built-in math functions, you can play with the numbers to see how the result is affected. Using this “what-if?” analysis, you can see what affect changing a data value or calculation can have on your monitoring program.

Spreadsheets can also be used for graphing data points, reporting data analyses, and organizing and storing data.

## **1.3 BENEFITS OF USING EXCEL**

Microsoft excel is a powerful tool that is widely used to help people analyze organize data in a systemic manner. Using Microsoft Excel and other office applications, you can easily share your insight and analysis with partners, customers and co-workers with great zeal. Here are some of the benefits of using Microsoft Excel in terms of analyzing and sharing information within the workplace.

### **1.3.1 USER FRIENDLY INTERFACE**

The new Microsoft excel has an improved user interface that enable you to organize your information in a systematic manner. Based on your current project, whether writing formulas or creating tables, Office Excel features appropriate tools and commands to help you accomplish your task.

### **1.3.2 MANAGES AND ORGANIZE MASSIVE DATA**

Work with loads of data using Microsoft Excel, which provide endless opportunities in regards to data management. Apart from having a bigger grid, Microsoft Excel also supports multicore processors to help you calculate formula-intense tasks.

### **1.3.3 PROVIDES BETTER ANALYSIS**

Use the redesigned chart engine in Microsoft Excel to present your data in professional oriented charts. Apply visual modifications to your presentation such as soft shadowing, 3-D effects and transparency. Moreover, create and manage massive data the same way because Office Microsoft excel also supports other office applications like Microsoft Office Power Point.

### 1.3.4 ENJOY POWERFUL AND IMPROVED TABLE FEATURES

Create, filter, format and expand multiple tables with a set of formulas since Microsoft excel has improved features for tables. For instance, if you want to view data in an extended table, Office Excel keeps table headers in view as you scroll.

### 1.3.5 SHARE SPREADSHEETS

Use Microsoft Excel to share multiple spreadsheets with co-workers. Other parties may also access the data online as it renders the spreadsheets as HTML. Additionally, you can navigate, filter, sort and input parameters, all within the Web browser.

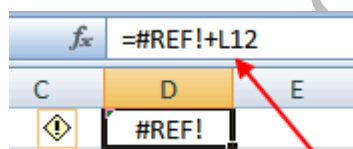
Besides its numerous benefits, Microsoft Excel also has its share of shortcoming as well. Many users claim that Office Excel is not easily shared compared to other office applications.

## 2. ERROR MESSAGES (CELL REFERENCE)

If you get an error message in Excel you might not get much help from the program in finding out the cause. The articles listed here cover the cause and cures for a number of common error messages in Excel, such as #REF!, #NULL!, and #####.

### 2.1 INVALID CELL REFERENCE

An invalid cell reference error message occurs when a spreadsheet formula contains incorrect cell references.



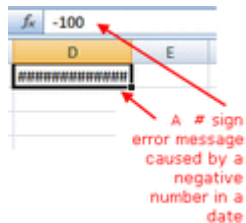
#REF! error in  
an Excel  
formula

In above example, if you click on the cell that contains the #REF! error, you will see that the cell reference within the cell has been replaced with #REF!. Therefore, in order to fix this error, you need to re-enter the correct cell references into your formula.



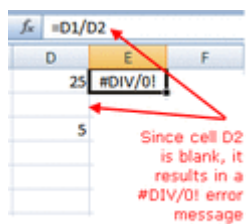
## 2.2 COLUMN NOT WIDE ENOUGH

Sometimes referred to as “Railroad tracks”, this condition is not really an error, but it occurs frequently and it can be frustrating if you don't know what it is or how to fix it.



## 2.3 DIVIDING BY ZERO

A #DIV/0! error message occurs when a formula tries to divide by zero. This article covers situations when this error will occur and how to correct it.



This problem can be overcome by using the Excel IF function to identify a possible division by 0 and, in this case.

## 3. CONDITIONAL FORMATTING

With conditional formatting, you can select one or more cells, and create rules (conditions) for when and how those cells are formatted. The conditions can be, based on the selected cell's contents, or based on the contents of another cell.

You can control the following formats:

- Number format
- Font, font style, and font colour (but not font size)
- Fill colour and fill pattern
- Border colour and border style (but not border thickness)

If the rules (conditions) that you specified are met, then the formatting is applied.

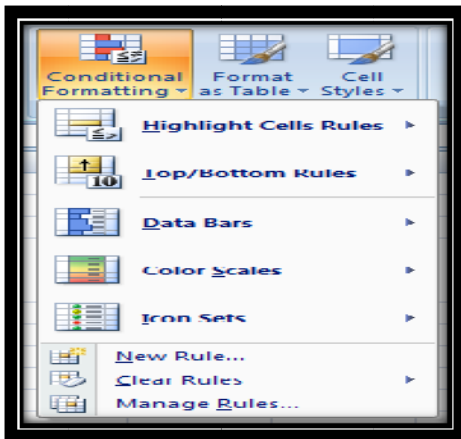
### 3.1 ADVANTAGES OF CONDITIONAL FORMATTING

- Make the feature easier. We wanted to make it much easier for users to find the feature, to add conditional formats to their work, and to remove them too.
- Make more possible without needing to write formulas. We wanted users to be able to set up conditions like “top 10%” and “duplicates” with just one click.
- Provide new “visualizations”. We wanted to provide users with new visualizations for the purposes of exploring large data sets, identifying trends and exceptions, and quickly comparing data. We also wanted our new visualizations to be useful for annotation and presentation purposes.
- Address top customer requests. Many, many users have asked for more than three conditions, better UI to be able to reorder rules, etc., so we wanted to address those requests.
- Provide a better experience in PivotTables. We saw an opportunity for conditional formatting to “do the right thing” when applied to PivotTables. For example, it should be easy to apply a conditional format to an entire level and have new values that show up inherit that format, behave sensibly when users pivot, sort, or expand/collapse, and so on.
- Provide a better experience in Tables. Tables are a new feature in Excel 12 that I will cover more in a few weeks, but suffice to say that they have structure and conditional formatting takes advantage of the structure to help the user set up useful conditional formatting rules. For example, you can create a conditional formatting rule to compare two columns in a table or, based on a condition, format the entire row if needed.

### 3.2 HOW TO APPLY CONDITIONAL FORMATTING

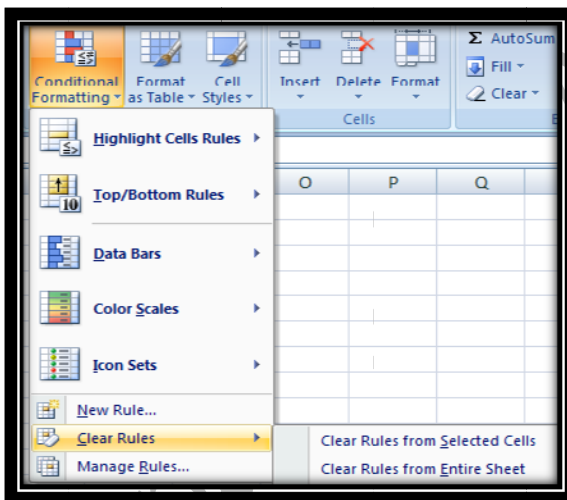
#### 3.2.1 TO APPLY CONDITIONAL FORMATTING:

- Select the cells you would like to format.
- Select the Home tab.
- Locate the Styles group.
- Click the Conditional Formatting command. A menu will appear with your formatting options.



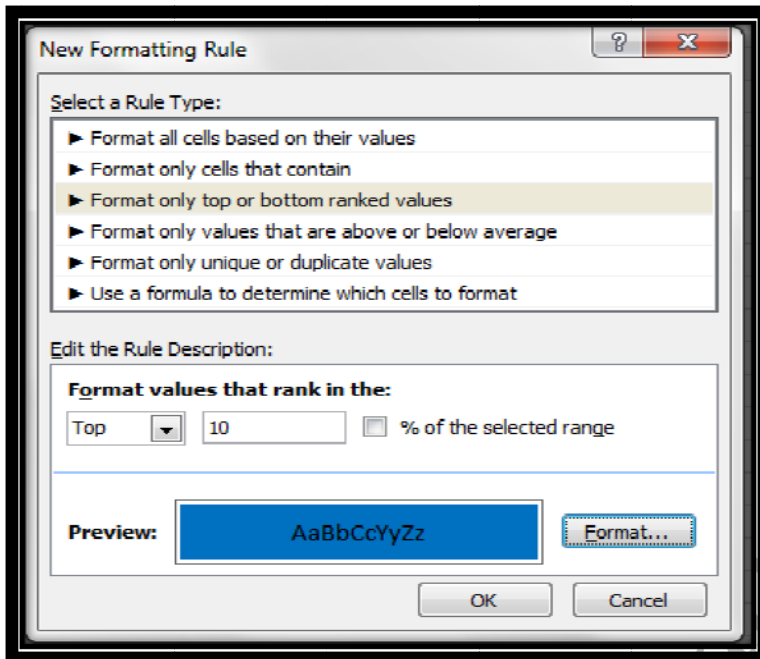
### 3.2.2 TO REMOVE CONDITIONAL FORMATTING:

- Click the Conditional Formatting command.
- Select Clear Rules.
- Choose to clear rules from the entire worksheet or the selected cells.



### 3.2.3 TO APPLY NEW FORMATTING:

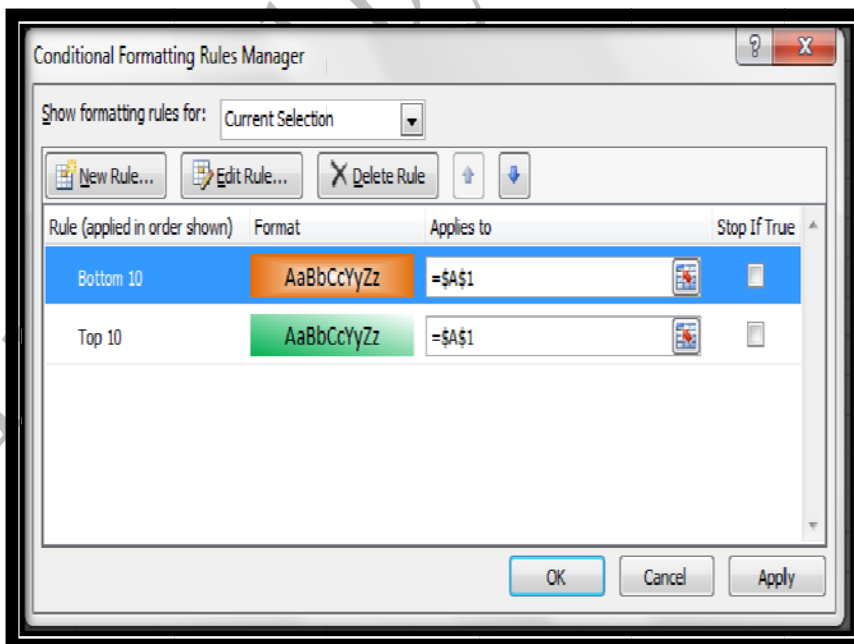
Click the **Conditional Formatting** command. Select **New Rules** from the menu. There are different rules, you can apply these rules to differentiate particular cell.



### 3.2.4 TO MANAGE CONDITIONAL FORMATTING:

Click the Conditional Formatting command.

Select Manage Rules from the menu. The Conditional Formatting Rules Manager dialog box will appear. From here you can edit a rule, delete a rule, or change the order of rules.



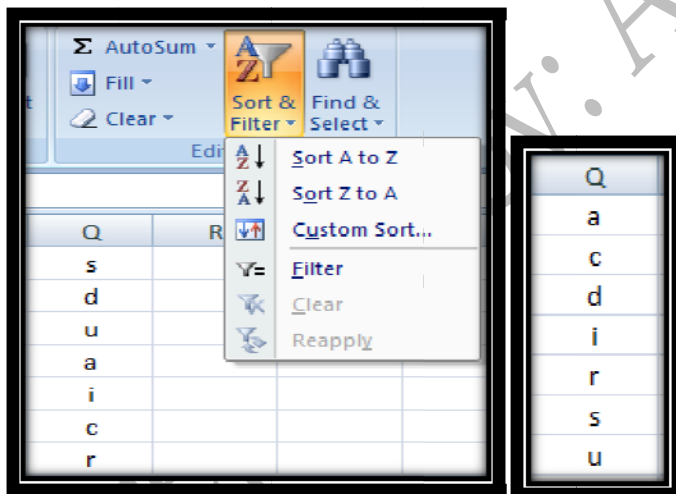
## 4. SORTING

Sorting is a common task that allows you to change or customize the order of your spreadsheet data. For example, you could organize an office birthday list by employee, birthdate, or department, making it easier to find what you're looking for. Custom sorting takes it a step further, giving you the ability to sort multiple levels (such as department first, then birthdate, to group birthdates by department), and more.

### 4.1 HOW TO APPLY:

#### 4.1.1 TO SORT IN ALPHABETICAL ORDER:

- Select a cell in the column you want to sort (In this example, we choose a cell in column Q).
- Click the Sort & Filter command in the Editing group on the Home tab.
- Select Sort A to Z. Now the information in the Category column is organized in alphabetical order.



#### 4.1.2 TO SORT FROM SMALLEST TO LARGEST:

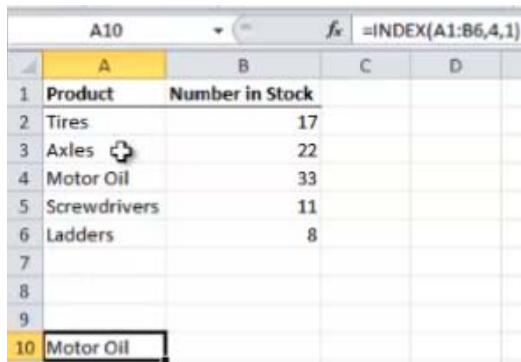
- Select a cell in the column you want to sort (In this example, we choose a cell in column Q).
- Click the Sort & Filter command in the Editing group on the Home tab.
- Select From Smallest to Largest. Now the information is organized from the smallest to largest amount.

## 5. FUNCTIONS

### 5.1 INDEX MATCH FUNCTION

The INDEX function (enter into spreadsheet) returns a value or reference of the cell at the intersection of a particular row and column, in a given range. It's syntax is:

`=INDEX(array, row_num, [column_num])`



	A	B	C	D
1	Product	Number in Stock		
2	Tires	17		
3	Axles	22		
4	Motor Oil	33		
5	Screwdrivers	11		
6	Ladders	8		
7				
8				
9				
10	Motor Oil			

Using the INDEX function

So, as an example type into A10 `=index(A1:B6,4,1)`. The first argument is "array" so we specify our table which is A1 through B6. Next argument is row number, and that's row 4, and the final argument is column number, and that's column 1. The function should return what is at the intersection of row 4, column 1. So, hit enter, and we see that it returns the text string MOTOR OIL which is correct. So the INDEX function basically looks up values for us as well.

Let's look at another function called MATCH. It's syntax is:

`=MATCH(lookup_value, lookup_array, [match_type])`

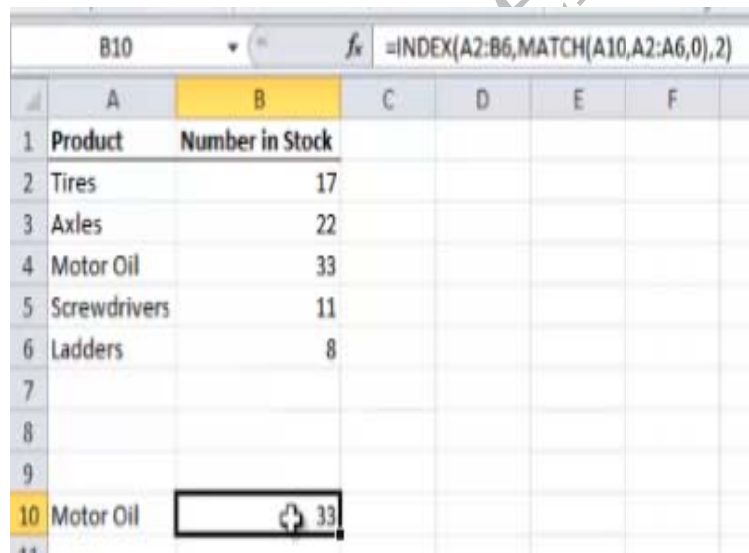
The MATCH function returns the relative position of an item in an array that matches a specified value in a specified order. It takes 3 arguments: the lookup value, the lookup array, and the match type, in which we can specify if we want an exact match or not. Let's take an example of using the INDEX and MATCH functions at the same time.

Let's use them to find out how many widgets we have in stock. In B10 enter the formula:  
`=INDEX(A2:B6,MATCH(A10,A2:A6,0),2)`

The first argument to INDEX is A2 through B6, our lookup array. Next we need the row and we want the MATCH function to determine which row the product motor oil is in, so we enter as the second argument to INDEX: MATCH(A10,A2:A6,0)

The lookup value we want is in cell A10, which is motor oil, so A10 is the first argument to MATCH. Then the lookup array is just A2 through A6, so that's the second argument to the MATCH function, and we want an exact match, so type 0 for the final argument to the MATCH function. So, MATCH will try to find the row number in which Motor oil is.

Then we have to tell the INDEX function which column to look in to return a value after we've found our product, so that will be column 2 of our table, which has the number in stock. So type 2, as the final argument to the INDEX function, then hit enters and there we have it! It returns the number 33, which is the correct amount of widgets in stock. Try typing in different products in cell A10 to see if it works correctly. So, we can see that the INDEX function is very similar to both VLOOKUP and HLOOKUP.



	A	B	C	D	E	F
1	Product	Number in Stock				
2	Tires	17				
3	Axles	22				
4	Motor Oil	33				
5	Screwdrivers	11				
6	Ladders	8				
7						
8						
9						
10	Motor Oil	33				

## 5.2 How to Apply:

Source

B	C	D
Employee code	Insurance policy number	AMOUNT
1114	101010	10000
1273	101011	12000
1487	101012	15000
1002	101013	10000
1556	101014	12000
1073	101015	15000
1392	101016	10000
1405	101017	12000
1619	101018	15000
1103	101019	10000
1561	101020	12000
1811	101021	15000
1734	101022	10000
1810	101023	12000
1344	101024	15000
1254	101025	10000



PULL THE USER ID & AMOUNT FROM SOURCE-1

Insurance policy number	101011
Employee code	1273 INDEX / MATCH
AMOUNT	12000 INDEX / MATCH

**Formula**

```
=INDEX('SOURCE-1'!$D$2:$D$22,MATCH('TARGET-1'!D5,'SOURCE-1'!$C$2:$C$22,0))
```

## 6. COUNT FUNCTIONS

Excel's Count Functions allow you to count up the number of cells being used for a specific purpose such as the number of cells containing number values or the number of blank cells in a data range.

- The function ignores empty cells and those that contain text data.
- If a number is later added to an empty cell the function will be automatically updated to include this new data.
- Note: dates, times, functions, and formulas are stored as numbers in Excel.
- They will, therefore, be counted by the COUNT function if present in the selected range.

### 6.1 HOW TO APPLY FORMULA

#### 6.1.1 COUNT

```
=COUNT(VALUE1,VALUE2,...)
```

### 6.1.2 COUNTA

=COUNTA(VALUE1,VALUE2,...)

### 6.1.3 COUNTBLANK

=COUNTBLANK(RANGE)

### 6.1.4 COUNTIF

=COUNTIF(RANGE,CRITERIA)

	A	B	C
1	3	<b>FUNCTIONS</b>	<b>RESULT</b>
2	5	COUNT(A1:A10)	4
3		COUNTA(A1:A10)	8
4	-	COUNTBLANK(A1:A10)	2
5	=	COUNTIF(A1:A10,"<=5")	3
6	.		
7	,		
8			
9	8		
10	0		

**1.**

COUNT ONLY  
CELLS THAT  
CONTAINS  
NUMBER.

**2.**

COUNT CELLS  
THAT ARE NOT  
EMPTY.

**3.**

COUNT CELLS  
THAT ARE  
BLANK.

**4.**

COUNT NO. OF  
CELLS THAT MEET  
GIVEN  
CONDITION.

## 7. PIVOT TABLE

Pivot Table is one of the most powerful features in Excel. This presentation describes Pivot Tables and Few Features of Pivot Table

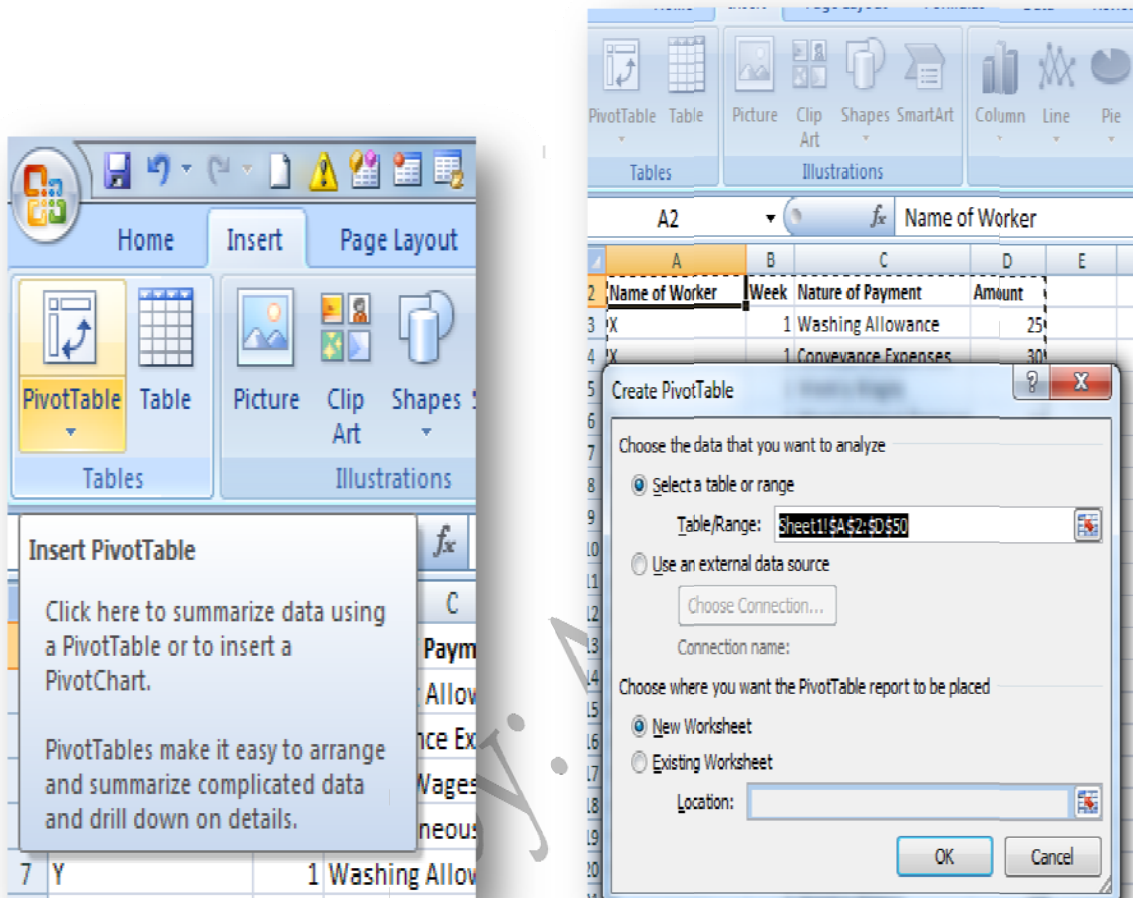
A pivot table is a great reporting tool that sorts and sums independent of the original data layout in the spreadsheet. If you never used one, these below example will most interesting for you.

### 7.1 HOW TO APPLY

As given in example I have created data of 3 Workers x,y,z and their, weekly payments in Various Segments. Selected a Range of (A1:D50)

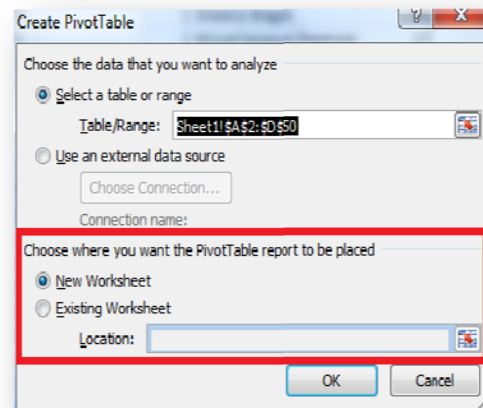
1	List of Weekly Payments to Building Workers			
2	Name of Worker	Week	Nature of Payment	Amount
3	X	1	Washing Allowance	25
4	X	1	Conveyance Expenses	30
5	X	1	Weekly Wages	45
6	X	1	Miscellaneous Expense:	12
7	Y	1	Washing Allowance	20
8	Y	1	Conveyance Expenses	10
9	Y	1	Weekly Wages	50
10	Y	1	Miscellaneous Expense:	10
11	z	1	Washing Allowance	15
12	z	1	Conveyance Expenses	5
13	z	1	Weekly Wages	25
14	z	1	Miscellaneous Expense:	10
15	X	2	Washing Allowance	25
16	X	2	Conveyance Expenses	30
17	X	2	Weekly Wages	45
18	X	2	Miscellaneous Expense:	12
19	Y	2	Washing Allowance	20
20	Y	2	Conveyance Expenses	10
21	Y	2	Weekly Wages	50
22	Y	2	Miscellaneous Expense:	10
23	z	2	Washing Allowance	15
24	z	2	Conveyance Expenses	5
25	z	2	Weekly Wages	25
26	z	2	Miscellaneous Expense:	10
27	X	3	Washing Allowance	25
28	X	3	Conveyance Expenses	30
29	X	3	Weekly Wages	45
30	X	3	Miscellaneous Expense:	12

Now choose any cell in this table and choose Pivot Table wizard in the Data menu. Excel asks for the data source and suggests this table. Click OK.



Here, we need to understand the data range. Excel suggests the table as shown in above Slide. If you expect to add data in the future, set the data range to include as many rows as you think you will ever need. Rather than A1:D50, you may want to specify \$A\$1:\$D\$500.

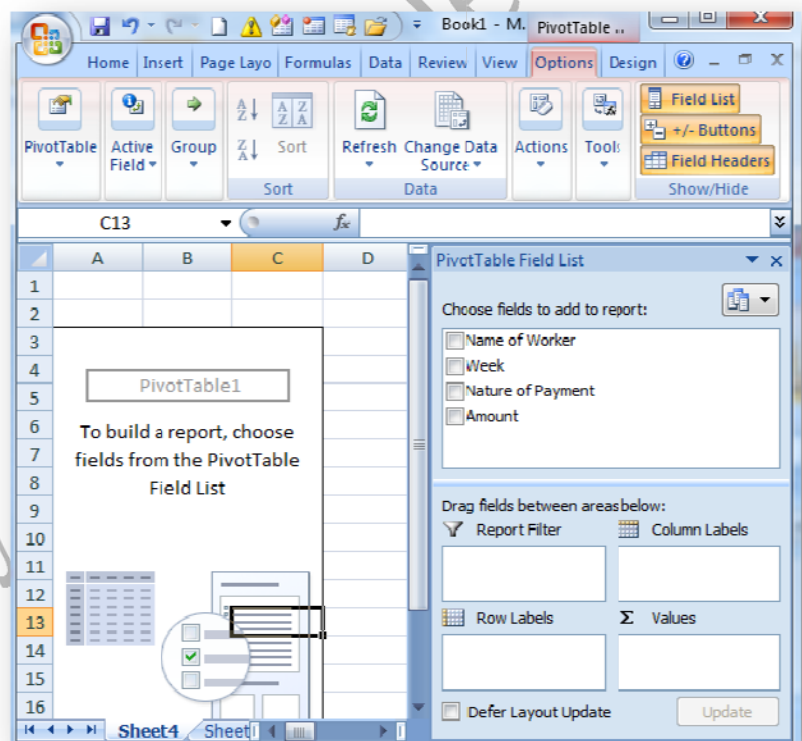
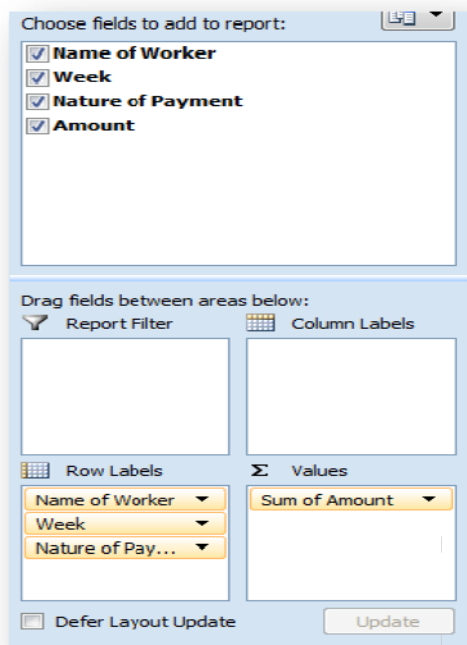
One more suggestion is, as shown in Graphic you can define the Destination of Pivot Table as New Sheet or Existing Sheet.



**Report Filter:** Use a report filter to conveniently display a subset of data in a PivotTable report or Pivot Chart Report. A report filter helps to manage the display of large amounts of data, and to focus on a subset of data in the report, such as a product line, a time span, a Geographic region

**Column Labels:** A field that is assigned a column orientation in a PivotTable report.

**Row Labels:** A field that is assigned a row orientation in a PivotTable report.



Report Filter

Column Labels

Row Labels

Σ Values