UNIT:4 SPREADSHEET

1. INTRODUCTION:

Electronic Spread sheet is a software package tool which allows user to create, manipulate and analyze data and information which organized in columns and rows format. Spreadsheet is a screen-oriented interactive program enabling a user to lay out financial data on the screen A spreadsheet is an electronic worksheet which is just like a paper sheet that contains rows and columns and data can be entered , manipulated and analyzed using it. Spreadsheet is a numerical data analysis tool that allows us to create a computerized ledger or worksheet. A manual ledger is a book having rows and columns that accountants use for keeping record of financial transactions and preparing financial statements. A spreadsheet offers considerable ease of performing such tasks by automating all arithmetic calculations, and making it easier to change certain numerical values and seeing the effect of these changes. It is a screen-oriented interactive program enabling a user to layout of the financial data on the screen across the worksheet immediately.

It is a worksheet consisting of rows and columns in which any data can be entered. It is a software tool for calculating and evaluating numbers. The main feature of spreadsheet is its ability to create groups. This sheet also helps u to establish relationship between two or more sets of data. It is generally used to perform quick numeric calculations, store and analyze monthly/yearly data, for preparing financial statements and tax worksheets. Today several spreadsheet packages are available which can be used to prepare budgets, forecasts future cash needs, determine break-even sale points, prepare examination .results etc. Some examples of spreadsheet packages are:

- Microsoft Excel
- Lotus 1-2-3
- Quatrpro
- Gnumeric
- Smart sheet
- K-Spread
- Resolver one
- Open Office.org cal

Some Uses of spreadsheet:

- It is used for maintaining and analyzing inventory, payroll and other accounting records by accountants.
- It is used for preparing budgets and bid comparisons by business analysis.
- It is used for recording grades of students and carrying out various types of analysis of grades by educators.
- It is used for analyzing experimental results by scientists and researcher.
- It is used for tracking stock and keeping records of investor accounts by stockbrokers.
- It is used for creating and tracking personal budgets, loan payments, etc. by individuals.

2. MS-EXCEL:

Microsoft Excel is a powerful spreadsheet application that makes easier that ever to analyze report and share the user data. It is used to organize, calculate and analyze numeric data .MS-Excel used for preparing financial statements such as Invoice, salary sheet, budget, balance sheet etc. and other documents like Marks ledger, Report Card etc. in a tabular form. MS-Excel provides various charts such as Pie chart, bar Chart etc. and layout option. MS-Excel also has Auto Calculate feature and the user can easily find the SUM, AVERAGE, MAXIMUM, MINIMUM etc. of the selected cells. In MS-Excel is contains auto formulation buttons on the standard toolbar. Using these formulas user can perform his/her required operation with the data within cells. Microsoft Excel is a commercial spreadsheet application written and distributed by Microsoft for Microsoft Windows and Mac OS X. It features calculation, graphing tools, pivot tables and a macro programming language called Visual Basic for Applications. It has been a very widely applied spreadsheet for these platforms, especially since version 5 in 1993. Excel forms part of Microsoft Office.

Features of MS-Excel:

1. Workbooks: A document in MS Excel is called a workbook. Each workbook contains approximately sixteen worksheets by default. A user can change this number by resetting the default options. Worksheets within workbooks make it easy to bind files of related information. When a user opens a workbook, he can use all the worksheets to perform a task. To create a workbook, a user will have to select the **New** option from the File menu. To open an existing workbook, a user will have to select the Open option from the File menu. A user can insert a worksheet between two worksheets by choosing the Worksheet option from the Insert menu. Excel works with a consistent file concept. All data is gathered in workbooks .These workbooks store current status of the workspace, along with all currently opened files and the setting selected for them.

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2. Standardized User interface: The key combinations like cut, copy , paste, undo etc. are Standardized and most of the dialog boxes like similar to Microsoft other product. Excel also has standard operating system (menus) in the main Menu Bar are similar in word and power point. All options related to a particular command combined in a single dialog box.

3. Worksheet and graphics: It includes extremely powerful calculating features. Besides working with Numbers and texts, Excel also provides for presenting data graphically. This helps to a large extend for data analysis.

4. Data lists and Database: This is also another feature of EXCEL. Several effective functions are available for working with data listed in a tabular format. There are functions for evaluating, combining and rearranging data lists.

5. Data Exchange with other applications: Excel uses the advantage of the Windows environment. This especially applies to Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) within Excel and between Excel and other Windows applications cab be easily mixed in a single document. Importing & exporting the data form one to another windows application.

(Summarized Features of Ms-Excel):

- MS-Excel stores numeric data in rows and columns as organised tabular form.
- MS-Excel allows to perform arithmetic, Statically, Financial, Trigonometric etc. calculations.
- MS-Excel contains the feature of automatic re-calculation. If the data in the worksheet changed then it performs recalculation automatically.
- MS-Excel helps the user to display information in graphical form using lines, bar graphs and pie charts. It has a feature for conversion of entered data into graphical form easily.
- MS-Excel can also be used to manage non-numerical data.

Some Typical uses of Spreadsheets:

- For managing and analyzing inventory, payroll and other accounting records by accountant.
- For preparing budgets and bid comparisons by business analysts.
- For recording grades of students and carrying out various types of analysis of grades by educators.
- For analyzing experimental results by scientists and researchers.
- For tracking stocks and keeping records of investor accounts by stockbrokers.
- For creating and tracking personal budgets, loan payments etc. by individuals.

3. SOME TERMS USED IN MS-EXCEL:

WORKBOOK:

A workbook is a document in MS Excel. It is the main document or file in MS-Excel. Each excel file has "**.xls**" extension. Each workbook contains approximately 16 worksheets by default and one workbook can consist 255 sheets. A user can change this number by resetting the default options. To create a workbook, a user will have to select the **New command** from the File menu. To open an existing workbook, a user will have to select the Open option from the File menu. Excel works with a consistent file concept. All data is gathered in workbooks. Workbook automatically shows in the workspace when you open Microsoft Excel or other spread sheet.

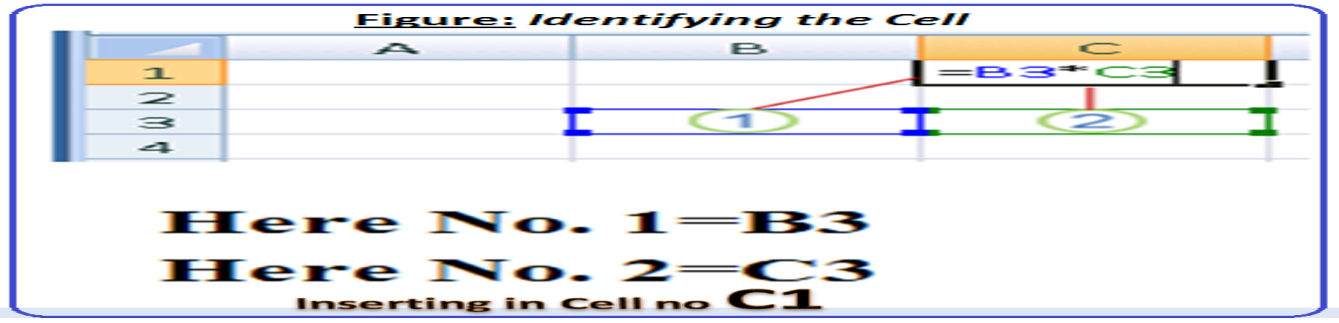
WORKSHEET:

A worksheet is the working area or place in a workbook. A workbook consists of a collection of one or more worksheets stored in the same file. Excel enables users to create and edit worksheets that the user store in workbooks. It is a collection or rows and columns that hold text, numbers and other symbols. A worksheet is a grid of cells, consisting of 65536 rows and 256 columns. Worksheet helps for data analysis and computation by using logical, mathematical and statistical tools and formulas.

CELL:

The intersection of a row and a column forms a small rectangle area which is called a cell. A cell is the basic unit of the spreadsheet. A cell can contain a value, formula or a text entry. Each cell is identified by its address. The address of the cell is called cell address. A cell address is formed by column heading followed by the row number. For example: A5 is the cell address referring to the cell at the intersection of column 'A' and row '5'.Each cell is surrounded by light gray lines known as Gridlines. Data can be entered only in an active cell.

Figure: *Identifying the Cell*



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RANGE OF CELL:

A range of cells, also known as block of cells that is the group of adjacent cells that forms a rectangular area. It can be a single cell, cells in a row, cells in a column or cells in rows and columns. MS-Excel indicates a range of cells by using colon sign **(:)** between the address of the first cell and address of the last cell. For example: a range of cells starting from A1 to D1 is written as **A1:D1**. You can perform many functions on a range of cells.

CELL ADDRESSES / REFERENCES:

Location name of the cell is called cell address or cell reference. User should apply all types of formula with reference to these cell addresses. The default notation for referencing cell is <column number> <row number> like A5. **According application there are three types of cell references:**

1. Relative Cell Reference
2. Absolute Cell Reference
3. Mixed cell Reference

Relative Cell Reference:

Cell address like A1,B1, C1 etc. are called relative referencing. When a formula contains relative referencing and it is copied from one cell to another and excel create an exact copy of the formula. For instance, addition of first row A1+B1 will change into A3+B3 when it moves to third column.

Absolute Cell Reference:

It prevents the changing of such types of Relative Cell Reference method. But Absolute Cell reference facilitates changing the row and column address according on formula copy which accomplished by placing dollar signs "$" within the cell addresses in the formula. For Instance, the formula will be A1+B1: here if the value of cell C2 contains the addition of cell A1 and cell B1, both cells are absolute and they will not change when copied.

Mixed cell Reference:

This type of reference is used where only row or column is fixed. For instance, the formula A$2+$B2, the row of cell A2 is fixed but B2 will change on same column. This syntax is similar to A$2+B2.

4. WORKBOOK and WORKSHEET OPERATIONS:

Excel enables users to create and edit worksheets that the user store in workbooks. Typically people work with a single worksheet or spreadsheet or sheet. Excel helps user to prepare financial information and other project timelines also. A company with several divisions might create a workbook with annual sales for each division and each division might be represented with its own tabbed worksheet inside the workbook. Workbook automatically shows in the workspace when you open Microsoft Excel or other spread sheet. Each workbook appears minimum three worksheets. The user can prepare bills, result analysis, salary sheet etc by applying different formulas. Worksheet helps for data analysis and computation by using logical, mathematical and statistical tools and formulas.

Creating a Workbook:

A blank workbook is displayed when Microsoft Excel is fires opened. The user can type information or design a layout directly in this blank workbook.

Steps to create workbook:

- Choose **file** menu bar
- Select New and click once Blank workbook from the task pane.
- A blank workbook opens in the Excel window. The New Workbook task pane is closed.

Inserting Worksheets:

By default each new workbook in MS-Excel defaults to three worksheets named Sheet1, Sheet2 and Sheet3. The user have the ability to insert new worksheets in required or delete others if no longer required.

Steps to create worksheet

- Choose Insert menu and select the worksheet form menu bar.
- A new worksheet tab is added to the bottom of the screen .It will be named Sheet4 or whatever the next sequential sheet number maybe in the workbook.

Worksheet Operations:

Each Spreadsheet contains 16384 rows and 256 columns. That makes 4,194,304 cells (i.e. 16384*256) ,each holding either text or numbers or formulas. As with MS Office packages, there is more than one way to do the same thing to start MS-Excel.

(Steps to start MS-Excel)

i) Click on the Start Button then Choose the All Programs option and click once on the Microsoft Excel potion. **OR**

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ii) Click on the Microsoft Excel icon on the recently used programs list above the All Programs Menu

OR

iii) Directly click on the Excel icon on the Office Shortcut Bar on the desktop.

*__Move cells on Worksheet:__ To move between cells on worksheet, click any cell or use the arrow keys. When you move to a cell, it becomes the active cell.

*__Select Sheets in a work book:__ If you select more than one sheet, MS-EXCEL repeats the changes you make to the active sheet on all other selected sheets. These changes may replace data on other sheets.

- A single sheet (Click the sheet tab)
- Two or more adjacent sheets (Click the tab for the first sheet and then hold down SHIFT and click the tab for the last sheet)
- All sheets in a workbook (Right click a sheet tab and then click select all sheets on the shortcut menu)

*__Insert a new worksheet:__ To add a single worksheet, click worksheet on the insert menu. To add multiple worksheets, hold down SHIFT and then click the number of worksheet tabs you want to add in the open workbook. Then click worksheet on the insert menu.

Selecting Cells and editing data:

Before entering, editing or formatting cells, they need to be selected. You can select a single cell, or group of continuous cells or even a discontinuous group of cells. Some steps for selecting cells with the mouse.

- To select a single cell, simply point and click on it to make it active.
- Click on a row number to select the entire row.
- Click on a column alphabet to select entire column.
- Click and drag to select a range of cells.
- Click on the empty button at the top left corner of the worksheet to select the entire worksheet.

To enter data, simply activate any cell by clicking on it and start typing .Press Enter key from the keyboard to conclude the entry. As you start typing, the text or number would appear in the active cell and in the formula bar simultaneously. If you make mistake while typing and before pressing Enter, simply press Backspace key to erase the present content and type the appropriate data. Fro the entry of data there can be entered any type of text or characters, numerals ,date and times, mathematical symbols such as /,*,+,-,%, etc.

5. FUNCTIONS IN MS-EXCEL:

One of Excel's most useful features is that it allows users to create custom formulas to perform calculations on their data. Excel also contains built-in formulas called functions that make it easy to perform common calculations on data. Functions are powerful feature of spread sheet or MS-Excel to calculate and compare the data of each cell. Functions are tools which help user to perform complex computations easily and quickly. Functions are predefined formulas in which the user has to simply provide the values based upon which the calculations are done. The user can use Excel formulas for basic number crunching, such as addition or subtraction, as well as more complex calculations such as payroll deductions or a student's average on test results. In sum we can say, Functions are pre-written formulas that take a value or values, perform an operation, and return a value or values in the cell in which they are entered. The function does computation on values provided by the user and shows the desired result.

Rules to enter the functions:

- All function name begin with a (=) assignment operator.
- Parentheses are used to enclose all arguments; commas are used to separate individual argument with the arguments.
- Space cannot occur anywhere within a function, except within a string enclosed in quotation marks or immediately after a comma between arguments.
- Two or more arguments within a function are separated by commas.

Some Functions used in MS-Excel:

1. **SUM ( )** : This function is used to add all the values provided either in a range or as individual values.

   Syntax:

   =SUM(number**1**,number**2**,...number**n**)

   Example:

   =SUM(A1,B1,C1)

   OR

   =SUM(A1:F1) (if you have continue series)

2. **AVERAGE( ):** This Function calculates the average of a series of special numbers.

   Syntax:

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=AVERAGE (number**1**,number**2**,…number**n**)

Example:

=AVERAGE(A1,B1,C1)

OR

=Average(A1:F1) (if yo have continue series)

3. **SQRT( ):**This function calculates the square root of any specified number.

   Syntax:

   =SQRT(number**1**)

   Example:

   =SQRT(49)

   Result: 7

4. **MAX( ):** This function finds out the maximum or highest value from a series of specified numbers.

   Syntax:

   =MAX (number**1**,number**2**,…number**n**)

   Example:

   =MAX(A1,B1,C1)

   OR

   =MAX(A1:F1)

5. **MIN( ):**This function finds out the Minimum or lowest or smallest value from a series of specified numbers.

   Syntax:

   =MIN (number**1**,number**2**,…number**n**)

   Example:

   =MIN(A1,B1,C1)

   OR

   =MIN(A1:F1)

6. **COUNT( ):** This function finds out the number of entries in a specified range.

   Syntax:

   =COUNT (number**1**,number**2**,…number**n**)

   Example:

   =COUNT(A1,B1,C1)

   OR

   =COUNT(A1:F1)

7. **ABS( ):** This function is used to get the absolute value of a number.The absolute value of a number means the number without plus or minus sign.If minus value enteren into the cell then this converts that value as without sign.

   Syntax:

   =ABS(number**1**)

   Example:

   =ABS(49) ABS(-490)

   Result: 49 Result: 490

8. **UPPER( ) :** This function is used to convert user case strings or text entry into upper case i.e. capital letters.This operation used for one cell conversion purpose.

   Syntax:

   =UPPER(String)

   Example:

   =UPPER(D8)

   =UPPER(“ram sharan shahu”)

   Result: RAM SHARAN SHAHU

9. **LOWER( ):** This function is used to convert user case strings or text entry into Lower case i.e. small letters. This operation used for one cell conversion purpose.

   Syntax:

   =LOWER(String)

   Example:

   =LOWER(D8)

   =LOWER(“RAM SHARAN SHAHU”)

   Result: ram sharan shahu

10. **IF( ) :** This function is one of the most useful and powerful functions available in MS-Excel. Through this function you can conduct conditional tests on values and formulas and execute some operations based upon the result of that text. The outcome of the test determines the value returned

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by the IF function. If the specified criterion or condition is satisfied, this function returns a value of True condition otherwise returns false condition.

Syntax:

=IF(Logical test**, True value, False value**)

Example:

IF(J21>1000,"hello","bye") (Here, if value of cell no. j21 is grater than 1000 then print "hello" otherwise print "bye".)

Some important formulas for calculation:

*=(IF(K8>=80,"EXCELLENT",IF(K8>=60,"FIRST",(IF(K8>=40,"SECOND","FAIL")))))

* =IF(AA14<=5000,AA14*20%,IF(AND(AA14>=5000,AA14<=10000),AA14*15%,500))

11. **SUMIF( ):**This function is combination of SUM and IF functions. Through this function the user can add up a series of numbers from a specific range and with the satisfaction of given criteria.

Syntax:

=SUMIF(number**1:**number**n, criteria**)

Example:

=SUMIF(A1:F1,"<90")

12. **AND( ) :** This function is logical function of MS-Excel which is used to return the result with the test of if every argument is true then run the true result.

It returns TRUE if all the conditions are true .It returns FALSE if any of the conditions are false.

Syntax:

=AND(logical**1, logical2**)

Example:

AND(A1>40,A2>40,A3>40)

=IF(AND(D22>=5000,D22<=10000),D22*15%,500)

13. **OR( ) :** This function is logical function of MS-Excel which is used to return the result with the test of if any one argument is true then run the true result.

Syntax:

=OR(logical**1, logical2**)

Example:

OR(A1>40,A2>40,A3>40)

=IF (OR(D22>=5000,D22<=10000),D22*15%,500)

Example: PRACTICE SHEET.xls

6. CHARTS IN EXCEL:

A Chart is a graphical representation of Spreadsheet data. Chart showing the data in a diagrammatic way to give more clearly about data, and charts are more interesting and easier to read. Chart helps to analyses data and make comparison between different spreadsheet values. Chart can be stored separately on chart sheets which can be printed, viewed, or edited, or they can be embedded in the current sheet so that they become a part of it.

Types of charts:

MS-Excel offers various charts types and several variations on each chart type. Excel has the ability to combine types. At any point of time, the user should choose that chart type which presents the data most clearly and effectively.

1. **Area Chart:** Shows the magnitude of change over time. It is particularly useful when several components are changing and the user is interested in the sum of Components.
2. **Column Chart:** A column chart uses vertical bars or columns to display values over different categories. They are excellent at showing variations in value over time.
3. **Bar Chart:** A Bar chart is similar to a column chart except these use horizontal instead of vertical bars. Like the column chart, the bar chart shows variations in value over time.
4. **Line chart:** A line chart shows trends and variations in data over time. A line chart displays a series of points that are connected over time.
5. **Pie chart:** A Pie chart displays the contribution of each value to the total. Pie charts are a very effective way to display information when you want to represent different parts of the whole , or the percentage of a total
6. **Other Charts:** Other charts that can be creating in MS-Excel Bubble chart, pyramid chart etc. which given according versions of the MS-OFFICE.

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Creating an Embedded chart:

Charts can be created in either of two ways in Ms-Excel-2003.Embedded charts and a Chart Sheet .Excel creates an embedded chart by default. An embedded chart is placed on the same worksheet as the source data used to create it.

- Choose view and toolbars and chart on the menu bar.
- Select the range of cells that user want to chart. The source data should include at least three categories or numbers.
- Click the chart type pull down on the chart toolbar and select the chart that user would like to use.
- Open the chart options dialog box. Select chart and Option to add a title to the chart.
- Select the Titles tab and type the title of the chart in the Chart Title text box.

Different charts work best with different data .A pie chart for example, can only display one data series at a time.

Creating a Chart Sheet:

Sometimes, you may want to create a chart and place it in a separate sheet in the workbook, this is called a Chart Sheet. It can make your chart stand out, particularly when working with complicated spreadsheets.

Guidelines for move an embedded chart to a chart sheet:

- Create an embedded chart.
- Select the chart to be moved to a chart sheet
- Choose Chart and then choose Location from the menu bar.
- In the Chart Location dialog box appeared, then select the as a new sheet ration button. (This button adds the chart as an embedded object on the worksheet)
- Click the Ok button. The chart is displayed on a separate chart sheet in the Workbook. You can use the Chart Location dialog box to rename the chart also.

7. DATA VALIDATION IN MS-EXCEL:

You can have Excel help you to validate data entered in cells. Under **Data Validation Settings,** you can select the type of validation you want. You can restrict the data to be only within a particular number or a date range or text specific length, or even values of defined list. The validation also is based on a custom formula. If wrong data is entered, Excel can through up an error entered on the error alert tab.

8. PIVOT TABLES IN MS-EXCEL:

MS-Excel allows us to pivot our data via drag-and-drop to produce meaningful information. This makes Pivot tables interactive in that once the table is complete we can very easily see that the effect of moving or pivoting our data has on our information. Pivot table is used to produce meaningful information from a table of information. The user can generate and extract meaningful information from a large table of information within a matter of minutes.

Pivot Chart is also available in MS-Excel. These are simply charts that are read from the table created via Pivot Chart Wizard. In fact Pivot Tables are really no longer just Tables that are now Pivot Tables and Pivot Chart Reports.

Guidelines for Pivot Tables:

The most important factors when considering using a Pivot Table is to have our data set up in what could be termed as a table and /or list. As our Pivot Table will be basing all its data on this list or table it is vital that we set our tables and lists up in a uniform way.

Step:1 Prepare the worksheet for any topic with different required fields.

Step:2 Select all the data range. Choose data menu and choose Pivot Table and Pivot Chart Report.

Step:*3* We will get the dialog box .Choose Microsoft Excel list or database option. Choose Pivot table and select Next.

Step:4 Then we will get another small box. Select the data range.

Step:5 Again we will get another dialog box .Choose new worksheet and choose finish.

Step:6 We will get pivot table design window. Now pickup the required field on required place. Now pickup region on row field. Pickup any field topic on page field And choose the pivot field list box.

Step:7 We can view the system as below. Select the required page heading as entered any topics on different regions.

Now use the option and analyze the data to find about any topic you have selected.

9. DATA SORTING:

Sorting list is a common spreadsheet take that allows you to easily reorder your data. The most common type of sorting is alphabetical ordering, which you can do in ascending or descending order. This data sort feature allows

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you to alphabetically rearrange any type of data, either in ascending or descending. This frees you from the bother of having to rearrange data while typing. Just enter the data in random order and apply Data Sort to rearrange it for you.

Guidelines:

a. Select data from the main sheet.
b. Select sort. The sort dialog box will appear.
c. Select the category you would like to Sort by.
d. Select Ascending to sort in alphabetical order from A to Z.
e. Click Ok.

To sort in reverse alphabetical order from Z to A, select descending.

10. FILTER:

MS-Excel provides a feature to set the entered data and information in to specific sequence. Filtering is a quick and easy way to find and work with a subset of data in a range. A filtered range displays only the rows that meet the criteria you specify for a column. Microsoft Excel provides two commands for filtering ranges: AutoFilter and Advanced Filter.

Unlike sorting, filtering does not rearrange a range. Filtering temporarily hides rows you do not want displayed. When Excel filters rows, you can edit, format, chart, and print your range subset without rearranging or moving it.

Using Auto Filter:

The *Auto* filter feature of MS-Excel makes filtering or temporarily hiding the data in a spreadsheet very easily. This allows you to focus on specific spreadsheet entries.

Guidelines for Auto filter:

- Select Data from the main menu.
- Select filter. Then choose the Auto filter.
- Click the drop-down arrow next to the heading you would like to filter.
- Choose the data you would like to display.
- Click the drop-down arrow again and **select All** to display to all the data display.

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