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2.6.1 Definition of Terms

- ❖ A spreadsheet manual or electronic is a ledger sheet that enables the user to enter, edit and manipulate numeric data. An electronic spreadsheet is an automated version of the accountant's ledger. It eliminates the paper, pencil and eraser. Usually, data is organized into rows and columns.
- ❖ Examples of Electronic Spreadsheet Applications are;
 - ✎ Microsoft Excel 2010, Quattro Pro, Lotus 1-2-3, VisiCalc
- ❖ Advantages of electronic spreadsheets over the manual spreadsheets are;
 - ✎ Neatness
 - ✎ Numeric data can be edited and manipulated easily
 - ✎ A large virtual sheet for data entry
 - ✎ Enhanced formatting capabilities
 - ✎ Built-in functions which enable the user to create powerful mathematical formulae
 - ✎ Automatic recalculation – The result of a given formula auto-adjusts when a value used in formula is changed
 - ✎ Advanced data manipulation tools like sorting, filtering, data validation, Sub-Total, etc.
 - ✎ Data presentations tools like charts

2.6.2 Introduction to Microsoft Excel 2010

- ❖ Microsoft Excel 2010 is one of the products in the Microsoft office 2010 programs suit. The previous versions of Microsoft Excel include; Microsoft Excel 97, 2000, XP, 2003 and 2007
- ❖ **Starting Microsoft Excel 2010**
- ❖ In the previous lecture, you learnt how to start Microsoft Word 2010. You would require the same skills to start Microsoft Excel 2010 and any other Microsoft office program. Just to remind you, the steps you would need to start Microsoft Excel are;
 - ✎ Double click the Microsoft Excel 2010 shortcut icon from the desktop

Or

- ✎ Click on start button from the task bar on the desktop

- ✘ Point at All Programs from the pull up menu
- ✘ Point at Microsoft office from the sidekick menu, then click on Microsoft Excel 2010 from the sidekick menu.
- ❖ **NB:** The MS Excel window showing a workbook with a number of worksheets which can be used to enter data is displayed. See diagram below;

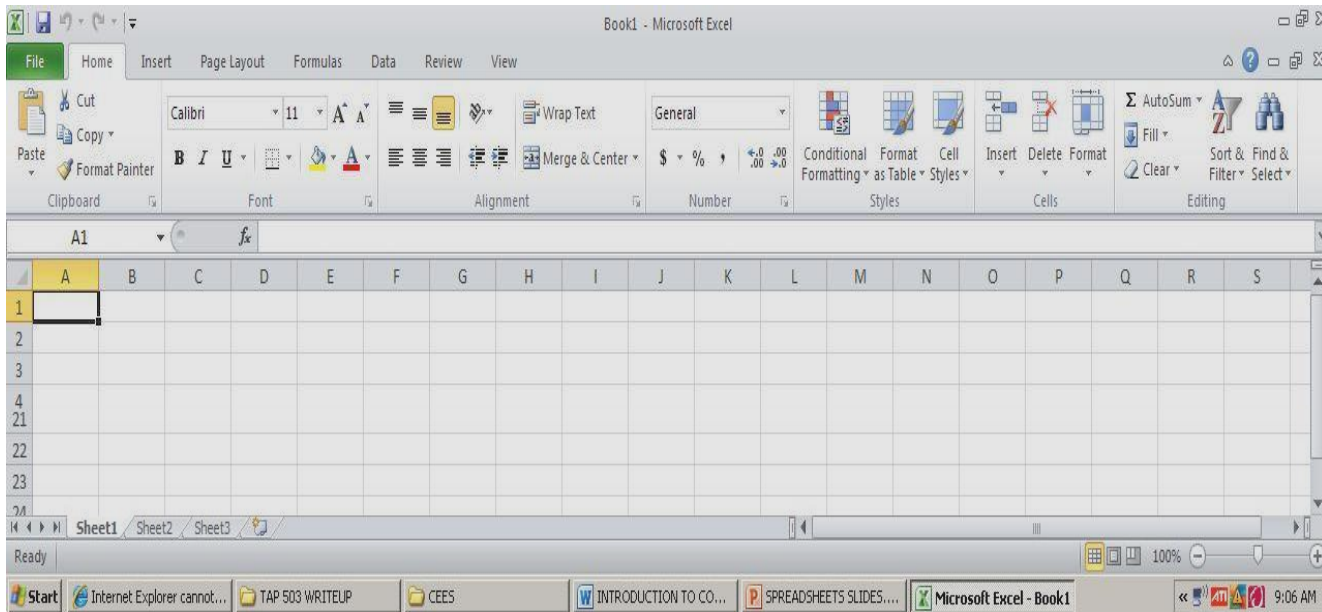


Figure 2.6.1: Microsoft Excel 2010 Screen Shot

➤ **Microsoft Excel 2010 Screen Features**

- ❖ Microsoft Excel has its screen components organized similarly as in Microsoft Word 2010. Its ribbon consists of file tab, home tab, insert, page layout, formulas, data, review and view tabs. Other unique features include;
 - ✘ **Formula bar:** Displays the contents of the active cell including formulas and functions. Also used to enter data into a cell.
 - ✘ **Name box:** Displays the active cell, i.e. cell with a dark outline that indicates where data in the formula bar will be inserted. Used to name/label cells.
 - ✘ **Worksheet:** Blank area made up of rows and columns. Several worksheets form a workbook. Workbook refers to the user file that holds related information organized in a good manner.
 - Columns are the vertical division of the worksheet. Are labeled using letters of alphabet from A to XFD

- Rows are the horizontal divisions of the worksheet. Are labeled using numbers from 1 – 1048576.
- Intersection between a column and a row. Are referenced using column letter and the row number e.g. A1, B2 etc.
- ✎ **Worksheet tabs** – used to select the worksheets. Labeled as sheet1, sheet2, sheet3, sheet4 etc. there are 3 worksheets at default.
- ✎ **Worksheet browsers** – used for navigating through worksheets

2.6.2 Creating a Workbook

2.6.2.1 Entering data in a worksheet

- ❖ A cell can hold any of the following:
 - a) **Label:** Alphanumeric data that has no numeric significance and can only provide descriptive information e.g. name of a place, person etc.
 - b) **Value:** A numeric value (number) that may be used to perform numeric computations
 - c) **Formula and Functions:** A formula is user defined mathematical expression that evaluates into a value while a function is an in-built formula.
- ❖ Note the following when entering data:
 - 1) Type numbers as you press enter or tab or an arrow key to move to the next cell
 - 2) Precede a negative number with a minus sign
 - 3) To type a fraction, type the whole number followed by space then the fraction, otherwise, type zero(0), space and then the fraction.

NB: A cell filled with ##### means that the number is too large to fit in the cell. Adjusting the column width or row height fits the number in the cell.
 - 4) To type text, click the cell where to type the text, type the text from the keyboard and press enter or tab or an arrow key
 - 5) To type number as text, precede the number with an apostrophe(‘)
 - 6) To enter a new line within a cell, press ALT + ENTER.
 - 7) To type date and time, type using any of the format valid date and time format.

8) To enter data in series e.g. 1,2,3....., type the first two data in the series in two adjacent cells, select the data, point at the handle at the right bottom end of the cell selector and drag outward to fill the series or inwards to clear. This uses the auto fill feature.

NB: Long text data appear truncated meaning it cannot fit within the cell, hence need to increase the size of the cell/column.

❖ **Activity:** Enter the data below in to Microsoft Excel worksheet and save it as Blue-Chip on the desktop of your computer. Adjust the column width and row heights to fit all the data. Merger and Center the cells in the first and second rows to appear as below;

Blue-chip Communication Ltd					
Summary of Year 2006 Sales Report					
Month	Nairobi	Kisumu	Mombasa	Total Sales	Average Sales
January	87350.00	65800.00	87000.00		
February	78000.00	23000.00	67000.00		
March	90000.00	28000.00	56000.00		
April	67000.00	45000.00	56000.00		
May	67000.00	28000.00	45000.00		
June	89000.00	31000.00	45000.00		
July	50000.00	45000.00	78000.00		
August	45000.00	42000.00	54000.00		
September	67500.00	43000.00	56700.00		
October	79000.00	28000.00	65000.00		
November	78000.00	56000.00	45000.00		
December	120000.00	87000.00	97000.00		
Yearly Sales					
Minimum Sale					

Average Sales					
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- ❖ To save a workbook, refer to Microsoft Word notes.

2.6.2.2 Editing a Workbook/Worksheet

- ❖ This involves making changes to data entered in to a cell and the layout of the worksheet
 - To edit the contents of a cell,
 - ✎ Either click the cell
 - ✎ click on the formula bar to type new cell contents or double click the cell and type in the new cell contents
 - To adjust column width;
 - ✎ Point at the row border. The mouse pointer changes to a cross.
 - ✎ Hold down the left mouse button and drag downwards to increase the height or upwards to decrease the height or double click the border to auto fit contents in the column width

NB: You can use the same steps to adjust row height
 - To insert a column;
 - ✎ Click on the column left of which to insert a new column
 - ✎ Click on the drop down arrow below the Insert option in the Cells group
 - ✎ Click on Insert Sheets Columns from the drop down list

NB: To insert a row or a sheet, follow the same steps
 - To delete a column or row or a sheet;

Click on the column or row or sheet to delete

 - ✎ Click on the drop down arrow below the Delete option in the Cells group
 - ✎ Click on what you want to delete.

2.6.2.3 Formatting a Workbook/Worksheet

- ❖ You can format a worksheet to improve its appearance just as in Microsoft word.

- To change font of data in a worksheet;
 - ✎ Highlight the data to format
 - ✎ Click on the home tab
 - ✎ Click on the format options to apply from the Font group.
 - ✎ For more Font options, click on the arrow next to the Font.
- To change alignment of data in a cell,
 - ✎ Highlight the data to format
 - ✎ Click on the home tab
 - ✎ Click on the alignment format options to apply from the Alignment group. For more alignment options, click on the arrow next to the Number group to display the format cells dialog box.
- To apply number formats in a cell,
 - ❖ Different numeric data can be formatted to show different quantities in a worksheet;
 - ✎ Highlight the data to format
 - ✎ Click on the home tab
 - ✎ Click on the number format options to apply from the Number group.
 - ✎ For more number formatting options, click on the arrow next to the Number group to display the format cells dialog box.
 - ✎ **Activity:** Open the Workbook created in section 2.6.2.1. Format the currency of all Sales Values to Kenya Shillings with a thousandth separator so as to appear as **Ksh. 87,350.00**.
- To format border formatting
 - ❖ The grids in a worksheet are non-printable until one formats the borders. To format the borders;
 - ✎ Select the cell range to format the borders
 - ✎ Click on Home tab then click on the drop down arrow below the Format option in the Cells group

- ✎ Click on Format Cells from the drop down list. The Format cells dialog box below appears;
- ✎ Click on border tab
- ✎ Select the line style, color and border type to apply then click ok

Activity: Apply some shading and patterns on some cells in your worksheet. Outline the steps followed.

2.6.2.4 Cell Referencing

- a) This is the process of addressing or identifying cells in a worksheet
- b) Different methods used include.
 - ❖ **Single cell reference** – in this the identity of a cell is done by using the column letter and the row number e.g. A1, B78
 - ❖ **Relative cell referencing** – in this, a cell reference changes relative to the position of the formula. E.g. Consider the formula =A1+B1 entered in C1. What happens when it is copied into B2 through B10?
 - ❖ **Absolute cell referencing** - when a formula is copied to other cells, the cell references remain unchanged. A dollar sign is placed before the column letter and the row number by either typing it or pressing F4 e.g. \$B\$20.
 - ❖ **Mixed cell referencing** - either the column or the row is absolutely referenced but not both e.g. \$B20, B\$20

2.6.2.5 Performing Calculations using formulae and functions

- a) **Using a Formulae**
 - ❖ When constructing a formula, it is important to note that;
 - ✎ The formula is typed after clicking on the cell where the result is to appear
 - ✎ Every formula starts with an equal sign (=)
 - ✎ Cell references are used in the formula other than the actual values
 - ✎ Math's operators are used depending on the operation being carried out e.g. + (addition), - (subtraction), / (division), * (multiplication), ^ (exponentiation)
 - ✎ Parenthesis (brackets) can be used to supersede the order of evaluation of the operators

✎ Example of a formula: = **B3 * B5**

- ❖ **Activity:** Open the Workbook created in section 2.6.2.1 and use a formula to calculate Total sales and Average sales for Nairobi, Kisumu and Mombasa for the months of January to December.

b) Using Functions

- ❖ Functions are in-built formulas and therefore they are inserted using the function wizard that guides one through the process.
- ❖ There are different categories of functions that include;
 - a) Math and trigonometry e.g. sum() etc.
 - b) Statistical e.g. average(), count(), rank() etc.
 - c) Logical e.g. the IF function
 - d) Financial e.g. pmt(), ppmt() etc.
 - e) Date and time e.g. now(), today() etc.
- ❖ To insert a function;
 - ✎ Click on the cell where the result should appear
 - ✎ Click on Formulas tab. The different categories of Microsoft Excel functions are displayed in the Function Library group
 - ✎ Choose the function to use by clicking on the drop down triangle below the function category
 - ✎ Specify the function arguments from the function argument dialog box e.g. the range containing values to be summed like **A2:B2** as shown below then click OK.
- ❖ **Activity:** Open the Workbook created in section 2.6.2.1 and use functions to calculate **Total Sales, Average Sales, Yearly Sales, Minimum Sales** and **Average Sales** for Nairobi, Kisumu and Mombasa for the months of January to December.

c) Copying a formula

- ❖ You do not have to type formula in all cells containing calculated values that use the same formula. You need just to do type one correct formula and copy it to all other cells. To do so, you can use the Copy and Paste commands as used to copy data or you can use the drag and fill method.

❖ To use the drag and fill method;

✎ Click on the cell containing the formula to copy

✎ Point and click on the handle on the bottom right of a the cell selector as shown below;

	A	B	C	D
1				
2		6	6	12
3		5	7	
4		9	5	
5				

✎ Drag outwards to fill the formula or inwards to clear. The cell references change as you copy the formula – remember Relative cell referencing covered in 2.6.2.4 above.

2.6.2.6 Data Management

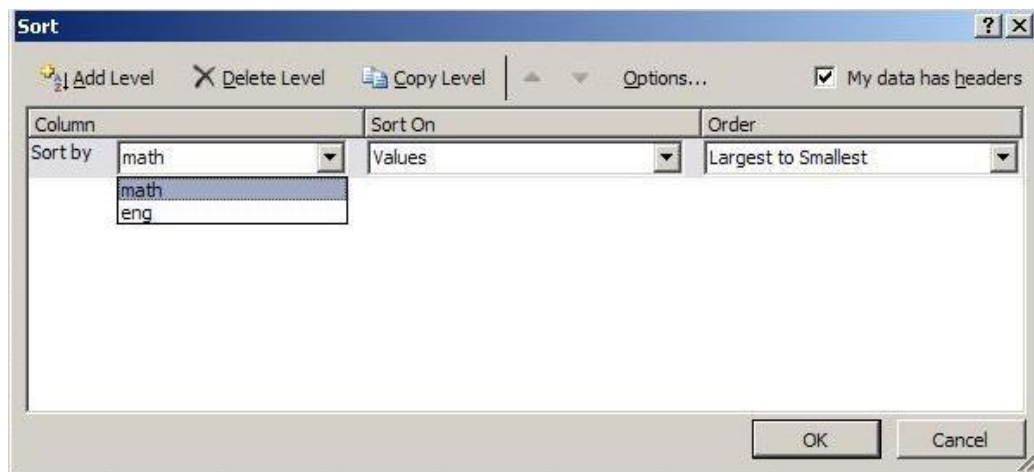
a) **Sorting**

❖ This means to arrange data in a particular order which could be in either ascending or descending order e.g. sorting a list of names of students alphabetically or marks in descending order from the highest to the lowest. To sort data in Microsoft Excel 2011;

✎ Highlight or click on the data to sort

✎ Click on the Data tab then click on Sort option from the Sort & Filter group

✎ Click on the checkbox labeled *My Data Has Headers* as shown below;



✎ Select column or header name by which to sort the data by in the sort by box

☞ Specify the sort order then click OK.

NB: To filter data, follow the same steps but click on Filter option.

- ❖ **Activity:** Open the Workbook created in section 2.6.2.1. Filter the data to show only Total Sales greater than or equal to Ksh. 175,000.00 for all towns.
- ❖ **Activity:** Differentiate between Auto Filter and Advanced Filter.
- ❖ **Activity:** Discuss the use of Data Forms in Microsoft Excel

2.6.2.7 Charts

- ❖ A chart is a graphical representation of the worksheet data to shows the relationships between values. The choice of the chart depends very much on the kind of data you are trying to chart and how you want to present the data. E.g. Line, pie, column etc.
- ❖ To insert a chart in Microsoft Excel 2010;
 - ☞ Click/Select the data to present in a chart
 - ☞ Click on Insert Tab then click on the drop down triangle below the type of chart to insert from the Charts group
 - ☞ Click on the Chart subtype from the drop down list. The chart is inserted as an Object in, in the current worksheet containing the data.

NB: Chart Tools tab appears at the top of the ribbon when the chart is inserted or when the chart is selected. You can use these chart tools to manipulate the inserted chart e.g. by changing the chart type, the location of the chart, add more data etc. For more options on chart type and subtypes, click on the arrow next to the Charts group.

- ❖ **Activity:** Open the Workbook created in section 2.6.2.1. Insert a chart to compare the **Average Sales** for the months of January to **June**. Label the chart axis accordingly. Insert a chart legend on the right. Move the chart to a new worksheet and label the worksheet as **Average Sales Chart**. Save the changes made in the workbook..

2.6.2.7 Protecting a workbook and a worksheet using passwords

- ☞ Click on the File button
- ☞ Point at Info from the pull down menu
- ☞ Click on Protect Workbook drop down triangle.

- ✎ Choose the type of protection to apply e.g. Encrypt with Password, Protect Workbook Structure etc.
- ✎ Enter the password and click OK then reenter the password and click OK again

2.6.2.8 Workbook and Worksheet Printing

- ❖ To produce hardcopies of data created in Microsoft Excel, you need to print it following the steps below;
 - ✎ Open the Workbook/worksheet to print its data
 - ✎ Click on the File button then click on Print from the pull down menu
 - ✎ Set the print options as desired e.g. printer, print range, number of copies and other options from the side list.
 - ✎ Click on the Print button on the top of the side list.
- ❖ **Activity:** Open the Workbook created in section 2.6.2.1. Set page setup to fit all the data in an A4 sized printing papers. Print a copy to bring it with you in the next face to face session.

2.6.3 Application of Electronic Spreadsheets in Education

- ❖ Electronic Spreadsheets can be used in procurement to replace the paper-based ledger sheets used in various aspects of managing procurement data. Some of the practical applications of electronic spreadsheets include;
 - ✎ Analysis and presentation of procurement records
 - ✎ Financial management e.g. maintaining electronic ledger books, balance sheets etc.
 - ✎ Management of supplier records
- ❖ **Activity:** Open the Workbook created in section 2.6.2.1. Assuming you are a class teacher, in a different sheet on this workbook, create a class merit list consisting of the following columns; **AdmNo, Name, Maths, Eng, Kisw, Bio, Phy, Chem, Geo, Total, Average, Grade, Rank**. Enter data for 50 students and perform the following tasks;
 - a) Calculate the;
 - i) Total marks for each student
 - ii) The average marks for each student

- iii) The highest and lowest score for each subject at the bottom of the worksheet
- iv) The number of student who sat for each subject at the bottom of the worksheet
- v) Use the advanced IF function to grade the students using the grading scale below;

AVERAGE MARK	GRADE
>=70	A
>=60	B
>=50	C
>=40	D
<40	E

- b) Rank the students depending on their average marks
- c) Sort the merit list by the average marks
- d) Use advanced filter to show only those students with grade A below the main work sheet
- e) Create a column chart to compare the performance of English against each subject for the first five students. Place the chart in a new worksheet.
- f) Insert the name of your School and the Class in the first two rows of the worksheet. Merge and centre these titles.
- g) Format your worksheet to appear as much attractive and official as possible
- h) Send this to your trainer through email, peter.kyalo@uonbi.ac.ke