**Electronic spreadsheet**

An electronic spreadsheet, simply referred to as a spreadsheet, is an application software used to calculate, organize and analyze numerical data

**Examples of electronic spreadsheets**

* Microsoft excel
* OpenOffice Calc
* Lotus 1-2-3
* Corel Quattro Pro

**Advantages of electronic spreadsheet over manual spreadsheets**

* It is easier to use
* Contain automatic recalculation features which enable the user to automatically perform calculation by simply coping a formula.
* Has inbuilt formula called functions that enable users to quickly perform calculations.
* They have inbuilt templates.
* Have better document formatting capabilities
* Enable user to produce neat work
* Offers a large virtual sheet for data entry and manipulation
* Utilizes the large storage space on computer storage devices to save and retrieve documents.
* Offers a larger virtual sheet for data entry and manipulation.

**Components of spreadsheet**

A spreadsheet has three main components namely: worksheets, database, and charts

**Worksheet**

A work sheet is the work area made up of rows and columns where data is entered

**Database**

A database is a collection of related data items organized so as to provide a consistent and controlled access to items.

**Graphs**

A graph is a pictorial representation of the base data on a worksheet. Examples of charts are line charts, pie charts and bar charts.

Disadvantages of spreadsheet

* If a wrong formula is entered, it leads to incorrect results.
* When the sheet is too long, it is not possible to view it at glance on the screen.
* It is costly to install, maintain and upgrade the computer systems, both hardware and software.

**Application areas of a spreadsheet**

1. Statistical analysis

Spreadsheets can be used to compute mean, mode, standard deviation, and complex statistical analysis.

1. Accounting

It is used by accountants for analyzing financial transactions such as computing totals and consolidating financial records.

1. Forecasting

The what if feature in spreadsheet is used for forecasting.

1. Mathematical and scientific

Spreadsheets are used to solve mathematical and scientific problem such as arithmetic and trigonometric.

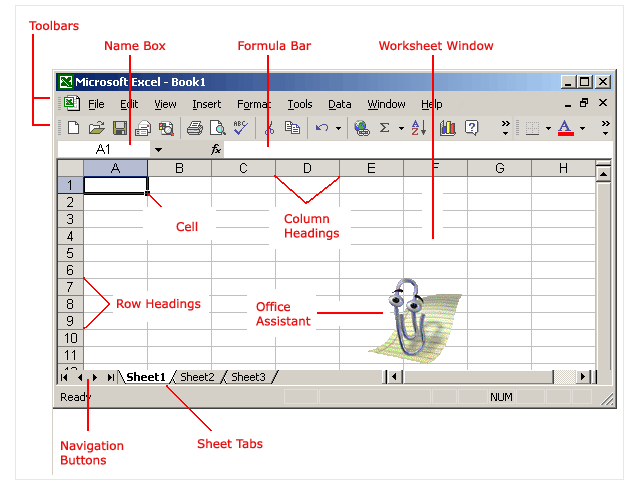
**Creating Workbooks in Microsoft Excel**

We shall use Microsoft excel. Versions of Microsoft excel are Excel 2003, Excel 2003, Excel 2007,Excel 2000, and Excel 2013.

**Starting Microsoft Excel**

1. Click on the start button on the desktop.
2. Select program the MS-office, click Ms-Excel 2003

A window as shown in figure 2.3 (b) appears.



Also show

Minimize button

Minimize/restore button

Close button

**Title bar**

The Excel XP Title Bar

The title bar displays both the name of the application and the name of the spreadsheet. The title bar consist Minimize, maximize, restore and close control buttons.

The minimizing button reduces the size of the screen to small icon on the task bar.

The maximizing button increases the size of the window to fill up the whole screen.

When the screen is in full size, the restore button is used to resize the screen to its normal dimensions.

The close button is used to exit the workbook.

**Menu bar**

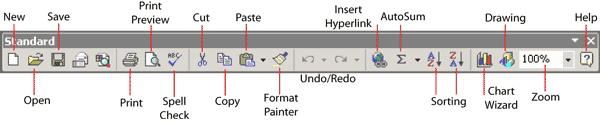
The Excel XP Menu Bar

The menu bar displays all of the menus available for use in Excel. The contents of any menu can be displayed by left-clicking the menu name.

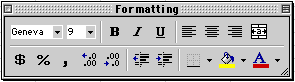
**Toolbar**

Standard tool bar

This consists of a row of icons that are clicked to quickly carry out specific tasks.



Formatting tool bar



This bar enable the user to enhance the appearance of data in the workbook.

**Column headings**

The Excel XP Column Headings

Each Excel spreadsheet contains 256 columns. Each column is named by a letter or combination of letters.

**Row headings**

The Excel XP Row Headings

Each spreadsheet contains 65,536 rows. Each row is named by a number.

**Name box**

The Excel XP Name Box

This shows the address of the current selection or active cell.

**Formula bar**

The Excel XP Formula Bar

The formula bar isplays information entered—or being entered as you type—in the current or active cell. The contents of a cell can also be edited in the formula bar.

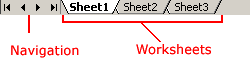
**Cell**

A cell is an intersection of a column and row. Each cell has a unique cell address. In the picture above, the cell address of the selected cell is B3.

**Active cell pointer**

It indicates the current active cell. It is characterize by heavy border.

**Navigation buttons and worksheet tabs**

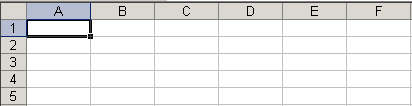


Navigation buttons allow you to move to another worksheet in an Excel workbook. They are used to display the first, previous, next, and last worksheets in the workbook.

**Workbooks and worksheets**

**A** worksheet is the work area made up of rows and column where data is entered.

A work book is a spreadsheet file that consist of one or more related worksheets.

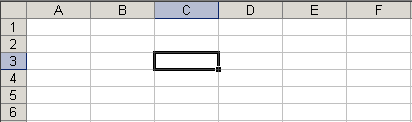


Column headings are referenced by alphabetic characters in the gray boxes that run across the Excel screen, beginning with column A and ending with column IV.

Rows are referenced by numbers that appear on the left and then run down the Excel screen. The first row is named row 1, while the last row is named 65536.

An Excel worksheet is made up of columns and rows. Where these columns and rows intersect,

In the following picture, the cell C3—formed by the intersection of column C and row 3—contains the dark border. It is the active cell.



**Moving around the worksheet**

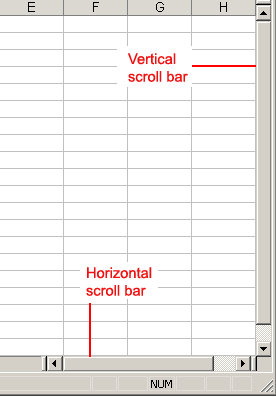
You can move around the spreadsheet in several ways.

**To move the cell pointer:**

* To activate any cell, point to a cell with the mouse and click.
* To move the pointer one cell to the left, right, up, or down, use the keyboard **arrow keys**.

**To scroll through the worksheet:**

The **vertical scroll bar** located along the right edge of the screen is used to move up or down the spreadsheet. The **horizontal scroll bar** located at the bottom of the screen is used to move left or right across the spreadsheet.



The **PageUp** and **PageDown** keys on the keyboard are used to move the cursor up or down one screen at a time. Other keys that move the active cell are **Home**, which moves to the first column on the current row, and **Ctrl+Home**, which moves the cursor to the top-left corner of the spreadsheet, or cell A1.

**To move between worksheets:**

As mentioned, each workbook defaults to three worksheets. These worksheets are represented by tabs—named Sheet1, Sheet2 and Sheet3—that appear at the bottom of the Excel window.

**To move from one worksheet to another:**

* Click the sheet tab—Sheet1, Sheet2 or Sheet 3—you want to display.  
    
  The Excel XP Sheet Tabs

Cell Address

The cell address is the combination of a column header and a row header that indicate the location of specific cell.

Creating worksheets

Creating a worksheet consists of starting the spreadsheet program and entering data in the cells of the current worksheet. However, a person can decide to create a worksheet either using the general format or from a specially preformatted spreadsheet document called a template.

As you type an entry, it is displayed in the formula bar. To place the content into the active cell press Enter key, an arrow key or click into another cell.

**Cell data entries**

Entries into a worksheet can be classified into four categories namely.

1. Labels
2. Values
3. Formulae
4. Functions

**Labels**

Labels are text entered in a cell used as row or column headings. Labels describe the contents of a column or row and cannot be manipulated mathematically. For example, if a column has names of car models, then the label or column heading can be cars.

Numbers can also be used as labels by simply adding an apostrophe before the number. For example 555 is a value while ‘555 is a label.

**Values**

These are numbers that can be manipulated mathematically. They may include currency, date. Numbers (0-9), special symbols or text that can be manipulated by the spreadsheet.

**Formulae**

Formula is mathematical expression created by the user that creates a relationship between cells to return a new value.

Every formula or function must contain the following elements:

* Equal sign (=).
* Function name
* cell arguments
* A

Automatic recalculation is when the result of a formula changes automatically when other values in the cells are referenced by the formulae.

**Functions**

These are predefined formula inbuilt within excel. For example to add contents of cells say B3 to E3 type

=Sum (B3:E3).

**Saving a workbook**

To save a work book:

1. Click file menu option, then select Save as command.
2. Select the location in which your workbook will be saved in the save in box, then type a unique name for the workbook in the file name box. Make sure the option Microsoft Excel Workbook is selected under save as type box.
3. Click the Save button to save.

**Retrieving a workbook**

1. On file menu , click open.
2. Click the look in drop down list arrow and select the drive or folder where the workbook was saved.
3. Double click the workbook icon that you want and the worksheet

Using basic formulae and functions

A formula is a mathematical expression used to solve mathematical problems while a function is an inbuilt formula used to perform calculations.

In excel formula or function must start with equal sign (=).

**Block operations**

Performing calculations on a worksheet data involves block operations. A block of selected cells in a worksheet is referred to as a range.

A range is specified by the address of its top left and bottom right cells or using a name.

**To select a range of continuous cells:**

* Click the top left cell of the range to be selected.
* Hold down the shift key.
* Click the bottom right cell of the range; the range will be highlighted

**To select a range of non-continuous cells**

* Click the top left cell of the range to be selected
* Hold down the Ctrl key.
* Click the bottom right cell of the range. Ctrl selects individually clicked rows, columns or cells.

**Arithmetic operators**

|  |  |  |
| --- | --- | --- |
| Symbol | Description | Example |
| / | Division | =A2/B2 |
| \* | Multiplication | =A2\*B2 |
| + | Addition | = A2+B2 |
| - | Subtraction | =B2-A2 |

Arithmetic operators follow the rule of BODMAS

**Relational operators**

|  |  |  |
| --- | --- | --- |
| = | Equal | =A2=B2 |
| > | Greater than | =A2>B2 |
| < | Less than | =A2<B2 |
| <> | Not equal to | =B2<>A2 |
| <= | Less than or equal to | =A2<=B2 |
| >= | Greater than or equal to | =A2>=B2 |

Enclosing part of the formula to be calculated in parentheses or brackets makes that part to be calculated first.

Cell referencing

Cell Reference is the location identity of a cell or range of cells on the worksheet. You can reference cells in other workbooks or in the same workbook.

References to cells in other workbooks are called external reference. Reference to data in other programs are called remote reference.

There are three types of cell referencing used when creating formulae and manipulating cells (s) content:

Relative referencing

The formula reference made to a specific cell changes when copied to another cell. For example, if C1 containing a formula = A1+B1 is copied to C2, the reference changes to A2 + B2.

Absolute reference

The reference made to a specific cell and does not change even if the formula is copied to another cell. The name of the column and row is preceded by a dollar sign ($), for example $G$10. For example, if the result of C1 is 170 and absolute reference is used, 170 will be copied to C2.

Mixed cell referencing

It is a combination of relative and absolute reference, $A3 or A$3. In the first case the column reference is absolute while the row is relative.

When a formula that uses a Mixed Reference is copied to another cell, only the relative part of the reference is adjusted.

For each of the following cell reference state the type of cell reference:

1. $F$5
2. A1B5
3. H$21
4. $D7

Using functions

Functions are ready made formulas, built into the spreadsheet, to perform a series of operations on specified range of values.

The following functions are the most frequently used.

|  |  |  |  |
| --- | --- | --- | --- |
| **Statistical Functions** | | | |
|  | Function | Example | Description |
| A | AVERAGE | = AVERAGE(B1:D1) | Calculate the mean or average of a group of cells  For example, suppose cell B1 has the value 16, C1 the value of 12 and D1 the value of 12 the average will be given by =AVERAGE(B1:D1) |
| B | COUNT | =COUNT(B1:B5) | Counts the number of cells that contain values in the selected range of cells.  For example: consider the following ranges: 4, 5, 4, 8, 5 in B1:B5 respectively.  = COUNT ((C5:G5) may return a value of 5 if all the cells have values, in case cell has no value, the function returns a value of 4. |
| C | MAX | =MAX(C5:G5) | Returns the biggest value in the selected range of cells.  For example. Consider the following ranges: 4, 5,4,8,5 in C5:G5 respectively.  =MAX (C5:G5) will return a value 8. |
| D | MIN | =MIN(C5:G5) | Returns the smallest number in the selected range of cells. For example in c above: MIN(C5:G5) will return a value of 4 |
| E | MEDIAN | =MEDIAN(C5:G5) | Returns the number in the middle of the set of the given numbers.  For example in (c) above: = MEDIAN (C5:G5) will return 5. |
| F | MODE | = MODE(C5:G5) | Returns the value appearing the most times in a range of cells.  For example consider (4,4,4,5,5,8) = MODE(C5:G5) will return the value 4. |
| G | Standard Deviation | =STDEV(C5:G5) | For example STDEV (C5:G5) will return the value 1.643168 |
| Mathematical Functions | | | |
| A | SUM | =SUM(A2:E2) | IF cells A2:E2 contain 5, 15, 30, and 40 respectively: = SUM(A2:C2) returns 60 |
| B | PRODUCT | It multiplies all the numbers given as arguments | For example, if the cells A4, B4, C4 and D4 contain 5, 15,30 and 40 respectively, the formula: = PRODUCT(A4:D4) gives the product as 90,000. |
| **Logical functions** | | | |
| a) | IF | = IF(logical\_test, value\_if\_true, value\_if\_false) | Assume the students scored the following marks in an exam: 56, 70, 39, 69, 54, 61, 82, 73, 45 and 74. The score are then entered in cells B2 to B12. The aim is to get a comment FAIL for marks less than 60 and PASS for marks greater than 60 at column D. The formula will be: = IF(B2>60,”PASS”,”FAIL”) at D2 |
| b) | Nested IF | The above scenario gives only a situation where there are only two comments. It is also possible to output more comments depending on criteria given. This is done through combining a number of “IF” function in one formula. This is what referred to as nested if. It is possible to have seven if functions in one formula | Assume marks greater than 80 is “GOOD” greater than 60 is “FAIR” and the rest is “POOR,” the formula will be written as:  = IF(B2>80,”GOOD”, IF(B2>60, “FAIR”,”POOR”)) |
| c) | SUMIF | =SUMIF(B2:B12, “>50”) | Assume the students scored the following marks in an exam: 56, 70,39, 69, 54, 61, 82, 73, 45 and 74 which are entered in cells B2 to B12. To sum all marks greater than 50 the formula would be =SUMIF(B2:B12, “>50”) |
| D | COUNTIF |  | Counts elements in a range ofcells whichmeets a given condition/criteria. For example, if students scored 56,67,45,78 and 65 one may want to know the number who scored over 60 and the marks are in cell B2 to B6. The formula will be = COUNTIF(B2:B6,”>60”) |

NB

An open bracket should be closed at the end of the entire “if” function.

If three comments are given, two “if” functions are written.

Between an if function and the comment, there should always be a comma.

**Insert function Formula**

To use insert function formula, follow the steps below:

1. Click in the cell where you want to place the function.
2. Click the Insert Function button (fx)
3. Select the function that you want to use and select OK
4. Enter the range of cell that you want to use as Arguments in the function and click ok.

Lab 1

1. What are the three basic elements of a function in Excel
2. Write a function to calculate the mean of the range B1:B10
3. Create the spreadsheet below, and save its as **Students-marks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | Student Name | Mathematics | English | Computer Studies |
| 2 | Ahmed Nasoor | 67 | 74 | 71 |
| 3 | Belinda Mwamburi | 58 | 65 | 56 |
| 4 | Charles Kijana | 81 | 69 | 70 |
| 5 | Dolly Pratt | 45 | 50 | 49 |
| 6 | Ekiru Ole NKoroi | 78 | 76 | 68 |
| 7 | Wangari Mwangi | 34 | 47 | 65 |
| 8 | Winnie Obama | 56 | 56 | 56 |
| 9 | Shruti Shah | 85 | 88 | 69 |
| 10 | Sammy Kipchoge | 60 | 55 | 46 |

Enter functions to compute the following:

1. Total marks for each student.
2. Average mark for each student
3. Highest mark in each subject
4. Lowest mark in each subject.
5. Standard deviation in each subject

Excel Error Messages

Errors occur when formula cannot resolve to a value or an answer. Some of the error you can encounter include:

|  |  |
| --- | --- |
|  | Description |
| #DIV/0! | The formula is attempting to divide by zero. Check the cell reference for blanks or zeros that may have resulted if you deleted a cell reference by the formula |
| #N/A | The formula refers to a cell that contains no value or an #N/A entry. This error value warns you that not all the data referenced by a formula is available. |
| #NAME? | Excel does not recognize a function, range or name you entered in a formula. Verify that all names used in the formula exist, and define any missing names. Verify also that you used the correct function name |
| #NULL! | The formula refers to an invalid range. Check to see if you entered the cell or range reference correctly. Remember to use commas (not spaces) between function arguments. |
| #REF! | A cell reference in the formula is incorrect. Check for changes to cell reference caused by deleting cells, rows, or column referenced by the formula |
| #VALUE | The formula contains the wrong type of argument or operator. Check for the correct syntax of the formula. |
| CIRCULAR | Errors appear on the status bar. The formula, either directly, or indirectly, refers to the same cell in which the formula is written, for example, for example typing =A3\*C3 in cell A3. |

Lab 2

1. Write down the formula to add values in cells A4 and C4.
2. Briefly state what you understand by the term “autoCalculate”.
3. Error messages are displayed when a mistake occurs while using functions. What does the error “#NAME/” mean?
4. Open the worksheet NewMarks-2005.xls. Modify it to compute the total for each student and average per subject save the changes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| 1 | Name | Math(%) | English(%) | Average(%) |
| 2 | Njeri | 80 | 70 |  |
| 3 | Mageto | 71 | 80 |  |
| 4 | Kanini | 68 | 60 |  |

**Worksheet Editing**

Data can be moved from on cell to another, one worksheet to another or one workbook to another by using the **cut or copy command.** The copy command is used for creating a duplicate copy of the original text in new location while the cut command is used for transferring data.

Clipboard is a location in which data that have been cut or copied are stored temporarily. The clip board can store up to 24 items.

**Procedure for copying**

1. Highlight the range of cells to be copied
2. To copy the data, press CTRL+C
3. To paste to the destination press CTRL+ V

**Procedure for moving**

1. Highlight on the range of cells to be moved
2. Cut the data by pressing CTRL+ X
3. Paste the data to the destination cell by pressing CTRL+V

**Worksheet formatting**

Worksheet formatting entails the enhancement of the appearance of the worksheet or data in the cells so that it can be more attractive to the reader.

**Aligning Text**

Aligning is the positioning of characters, text and numbers within a cell. You can align a selected text by clicking one of the alignment tools on formatting toolbar: left, center, align right or merge and center buttons.

Centering a title across multiple cell

To center worksheet titles within a range of selected cell, select the cells across which you want the text centered and then click **merge and center option.**

**Rotating Text**

You can rotate text clockwise between 0 and 90 degrees (reading upwards), or rotated clockwise between 0 and -90 degrees (reading downwards).

You can use rotated text effectively when you need vertical titles for reports or to label the sides of Charts, tables and drawings. To do this:

1. Select the cell or range containing data you want to rotate
2. Choose FormatCells menu, and click alignment tab
3. In the orientation box, drag the red-tipped pointer up or down to change the orientation; specify a value between 90 and -90 degrees in the Degrees box. Click OK.

Shrinking text to fit in a cell

**Shrink to fit** changes the font size of text so as it can fit in a cell

If you need to fit text in a cell without widening the column containing the text, you can shrink the size of the text by using the Shrink to fit alignment option. To do this:

1. Select the cell or range containing data you want to format.
2. In the Text control area, select the shrink to fit check box. Then click OK.

Wrapping Text in a Cell

**Wrap text**: arranges a lengthy text in a cell in multiple lines so that the complete text can be read.

If you enter a long text entry in a cell, you can have Excel wrap the text so that it forms a paragraph that fits inside that cell. The cell’s height increases to accommodate multiple line of text. To do this

1. Select the cell or range containing data you want to format.
2. Choose FormatCells menu, and click Alignment tab.
3. In the Text control area, select the Wrap Text check box and click OK.

Formatting numbers

You can apply various formats to numbers or values. These include changing the decimal numbers, inserting currency symbol and changing the date and time format.

To format numbers or values, the steps are:

1. Select the cells or range of cells containing the numbers
2. Right click the selected cells then choose format cells option
3. Select the category from the provided options
4. Click ok to apply

Numbering Styles

|  |  |
| --- | --- |
| Accounting | Aligns the currency symbol and the decimal points in a column |
| Custom | Creates format code using one of the existing codes as starting point. For example to insert Ksh, as currency symbol, click currency option, choose any symbol with three symbols at the symbols box then custom option. Delete the Symbol and type KSh instead. |

**Adjusting the Column Width**

Place the mouse pointer on the left or right border of the column heading. The pointer changes to a double-headed arrow.

Click and drag it to the right or left to increase or decrease the column width respectively.

**Adjusting the row height**

1. Select any cell within the row
2. Click format then row height
3. Enter the desired height for the row and click OK

**Inserting and deleting Rows and Columns**

* To insert a row or a column right click on the cell and then click insert.
* To delete a row or a column right click on the cell and then click delete.

Global worksheet formatting

You can format the entire worksheet based on user requirements. To perform global formatting:

1. Highlight the entire worksheet by either pressing CTRL+A
2. Use the format cell command

Border formatting

Border help in demarcating one cell range from another. To apply borders to cells:

1. Select a cell or range of cells where the border is to be applied
2. Click the cells option from the format menu
3. Select the borders tab from the dialog box.
4. Select one of the following preset borders:

* None – No boarders are to be applied
* Outline- Puts a border around the outer edge of the selected cells
* Inside- Applies a border on the inner edge of the selected cells

1. Select the line style from the style: list box
2. Change the color if need be.
3. Click OK to apply

Lab 3: Question

Create the following worksheet and then perform the tasks described below.

|  |  |  |
| --- | --- | --- |
| GATE WAY SKY AIRLINES  SALES REPORT | | |
| REGION | JANUARY | FEBRUARY |
| NORTH | 2,345,600 | 5,478,800 |
| SOUTH | 6734,890 | 7,5477,390 |
| EAST | 47,685,980 | 23,568,980 |
| WEST | 4,523,670 | 2,356,730 |

1. Calculate the totals for the January and February columns
2. During the months between March and December, the sales increased by a margin of 15% as from March. Calculate the sales for the whole year.
3. Change the color of the title to reflect the corporate color of the company, which issky blue. Apply lavender color to the remaining texts.
4. Set the alignment of the month title to 90 degrees
5. Format the currency to be in Ksh. with two decimal places
6. After the month of February, insert one or more column for comments.
7. Write a formula that will display “Good” if total monthly sales exceed Ksh. 1,000,000 and “Improve” otherwise.

Data Management

Data management practice include sorting, filtering, totals and subtotals and forms among others.

Sorting is arranging data in ascending or descending order.

To sort data:

1. Click any cell or highlight the range of cell to be sorted
2. Click sort then data from the menu bar
3. Click column to sort by
4. Choose Header row in my data range has section if you do not want the first row to be sorted.
5. Click ok to apply

NB.

If more than one column is to be sorted, then specify the next column to be used for sorting in the Then by section. Notice that a maximum of three columns can be used at a time.

Lab 4.

1. Open a worksheet and enter the data below and save it as personal details

|  |  |  |  |
| --- | --- | --- | --- |
| Gender | Age | Height | Resident |
| Male | 12 | 5.5 | Kile |
| Female | 45 | 7.5 | UK |
| Female | 7 | 2 | Nyeri |
| Male | 55 | 5.6 | Uthiru |
| Female | 67 | 6 | Maca |
| Male | 16 | 5 | Kimbo |
| Female | 18 | 5.2 | Agwata |

1. Sort it by age and save it as age
2. Sort it by height and save it has height
3. Sort it by age then by gender then by height save the sheet as final

Filtering Data

To filter is to display those records that meet certain criteria. It is faster way of finding and working with small group of data, if the worksheet contains too much information.

The methods available for filtering are

1. Auto filter
2. Advance filter

To filter data using the auto filler:

1. Select any cell in the list to be filtered
2. Click the data menu then filter
3. Click on the arrow within the column that should be used for filtering to select the criteria.

Lab 5:

1. Using lab 4, use the personal detail worksheet and filter females only and save it as female
2. Use the personal detail worksheet and find individuals with age greater than 18 and save it as age.

There are three filtering options:

1. Filter for the smallest or the largest number

Procedure

1. Click (Top 10) option from the drop down menu
2. Select top or bottom
3. Enter number to be used for filtering and click items or percent to filter by percent
4. Click OK to apply
5. Filter for a number greater than or less than another number
6. Click custom
7. Select is greater than, is less than, is greater than or equal to, or is less than or equal to on the left box
8. Enter a number on the right box
9. Click And or to choose another criteria and repeat steps (b) and (c)
10. Filter a range for rows that contain specific text

Click custom

Select equals, or does not equal, contains, or does not contain on the left box.

Enter the text you desire on the right box

To add another criteria, click And or Or and repeat previous step.

Click OK to apply.6555

If you need to find text values that share some characters but not other , use a wildcard character.

|  |  |
| --- | --- |
| Use | To find |
| ?(question mark) | Any single character. For example: com? Finds “come” and “comp” |
| * (asterisk) | Any number of characters. For example: \*st finds “east,” “west,” biggest” |

1. To add another criteria, click And or Or, and repeat the previous step.
2. Click OK to apply.

Note:

To view all the records or undo the filter, select **All** option.

To remove the arrow from the column heading, click **Data** then Filter and Select the **Autofilter** option

**Totals/Subtotals Functions**

After sorting, data can be summarized in a list by creating **Subtotals**option. When a list is summarized, Microsoft Excel calculates the subtotals based on subsets of data and calculates the grand total.

To add a subtotal to a list:

1. Sort the list by the column for which you want to calculate the subtotal.
2. Select a cell in the list
3. Choose data menu, the select the Subtotals option.
4. In the **At each change in box,** select the field that is to be used for subtotal
5. Select the function name to be used for calculating the subtotal in the **Use function**
6. Select the check box for the column that contain the values for which you want the subtotal in the **Add subtotal to**box.
7. After making adjustments, click OK to apply.

Using the personal detail worksheet (lab 4), find the total and subtotal of age of both female and males.

The subtotal dialog box has the following options:

1. **At Each Change in:**

Enables the user to specify the column that contains the items or groups by which the subtotal is to be done

1. **Use function**

**Enables** the user to select the summary function that has to be used to work out the subtotals.

1. **Add subtotal**

Enables the user to specify the column that contain the values that are to be subtotaled.

1. **Replace current subtotals**

Enable the user to replace all subtotals in the list, if there are any, with the new subtotals. The option has to be unchecked if the existing subtotals are not to be replaced.

1. **Page break between groups**

Enables the users to insert the subtotal and grand total rows below the detail data

1. Summary below data

Works out the summary of the values at the bottom of the data.

Forms

A form is a template that is specially prepared to enable faster input of data in the worksheet. It is usually formatted to easily enable the user enter data in a simple and desirable format.

To display a form

1. Highlight the text
2. Choose data menu then forms
3. Use the form to enter data in the worksheet.

Assignment

1. What is the difference between data sorting and filtering?
2. Give two ways in which data can be sorted
3. Discuss **three** options for special data filtering
4. Name and explain at least four options in the subtotal dialog box.
5. What is a form in Excel? Why are forms important?

Input validation

To ensure that user does not enter invalid data, set the validation criteria. An error message is displayed when data that violates this rule is entered.

To set data validation

1. Highlight the range of cell to validate
2. On the data menu, click validation.
3. Click the settings tab and select a validation criterion
4. To display an input message when the cell is selected, click the Input message tab,type the message to be displayed and check “show input message when cell is selected"
5. Set the Error alert then click OK.

Creating Charts

Charts enable you to present data in graphical form. Charts are updated whenever the data linked to them are changed.

Charts are updated whenever the data linked to them are changed.

Charts are visually appealing and they make it easy for users to see comparisons, patterns and trends in the displayed data.

Chart can be created on its own chart sheet or as an embedded chart on a worksheet, either way, the chart is linked to the source data.

Embedded chart

An embedded chart is saved as part of the worksheet on which it is created. They are used whenever a chart is to be displayed with worksheet data.

Chart sheet

A chart sheet is a separate sheet within the workbook that contains the chart. It is used when large or complex chart are to be edited separately from the worksheet data.

Examples of charts include

1. Column chart- bars are displayed horizontal. It is used for displaying data changes over a period of time.
2. Bar chart -bars are displayed vertically. It is used for comparing values of items in a group
3. Pie Charts- shows relationship among parts of a whole.
4. Line charts – shows trends of data at various intervals of time.
5. Xy Scatter Charts- shows the relationship between the numeric values in various data series.
6. Surface charts- they show the maximum number of combination between two values. They are useful when the optimum combination between two sets of data is to be found.

Lab 5

Representing Worksheet Data in a Chart

To create a chart.

1. Select the range of cells that contain the data. To select data of non-adjacent rows or columns, select a range of cells, press the control key, select another range of cells and release the control key.

|  |  |  |  |
| --- | --- | --- | --- |
| Gender | **Age** | Height | Resident |
| Male | **12** | 5.5 | Kile |
| Female | **45** | 7.5 | UK |
| Female | **7** | 2 | Nyeri |
| Male | **55** | 5.6 | Uthiru |
| Female | **67** | 6 | Maca |
| Male | **16** | 5 | Kimbo |
| Female | **18** | 5.2 | Agwata |
|  |  |  |  |

ii) Click on the Chart.. Option on the **Insert**menu or select the chart wizard option on the toolbar.

(iii) Select the chart type from the left pane of the window

iv) Select the desired chart subtype then click Next button

The chart option screen has six tabs. These are:

Title / Heading

Allows the entry of the chart title or the heading of the chart, the name of the group of the items in the X-axis and the name of the parameters on which the item is being measured in the Y-axis.

Axes

Allow the control of how the chart is presented

Legends

Provides detail about the data columns in a chart. If the category (x) axis option had been selected, the names of the items in the group are not displayed in the chart.

Gridlines

Allows the user to add gridlines on the chart. By default, major gridliness option of value (Y) axis area is selected.

Data labels

Provides labels on the chart based on the data series.

Data table

Displays the values for all the data series in a table below the chart.

Assignment

1. Discuss six different types of charts
2. Charts are important in spreadsheets. Explain
3. Differentiate between and embedded chart and a chart sheet
4. Explain the following chart wizard options: titles, axes, gridliness, legends, and data tables.
5. Explain how you would add labels and percentages on a chart.

Lab 6.

Enter the following data into a worksheet and save it as “Marks”,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| 1 | Name | Computer Studies | Chemistry | Physics |
| 2 | Wefwafwa | 88 | 46 | 43 |
| 3 | Wa Maria | 78 | 23 | 89 |
| 4 | Saitoti | 65 | 67 | 67 |
| 5 | Otieno | 68 | 66 | 76 |
| 6 | Ocampo | 56 | 56 | 89 |
| 7 | Njoroge | 69 | 78 | 35 |
| 8 | Njeru | 90 | 95 | 75 |
| 9 | Muli | 45 | 53 | 33 |
| 10 | Kioko | 78 | 89 | 89 |
| 11 | Kamande | 57 | 78 | 90 |
| 12 | John | 67 | 67 | 57 |
| 13 | Betty | 75 | 90 | 53 |

1. Compute the following from the worksheet above:
2. Average per subject and per student
3. Total for every student
4. Standard deviation per subject
5. Count marks in computer studies greater than 60.
6. Minimum and maximum mark per student
7. Assume the average per student greater than 80 is “Good”, greater than 60 is “FAIR” and the rest is “ POOR”. Use the if function to show this.
8. Enter 7/6 in cell A 20.
9. Create a new column and label it “ New Average”
10. Increase the average mark per student by the content in cell A20 using absolute cell referencing
11. Create a graph with names of the students, average and the new average. Label the graph appropriately.
12. Save change as “Marks1”.