SPREADSHEETS

Definition

Spreadsheet: application package designed to store, organize and manipulate numerical data and charts.

- Also called electronic ledger.
- Examples: MS Excel, Lotus 1-2-3

Uses of Spreadsheets

1. **Accounting**
   - Prepare budgets
   - Calculate profits

2. **Statistical analysis**
   - Calculating statistical values e.g. mean, median etc.

3. **Data management**
   - Organizes data in tabular manner
   - Operations include sorting, filtering etc.

4. Tracking value of assets
   - Calculating appreciation and depreciation.

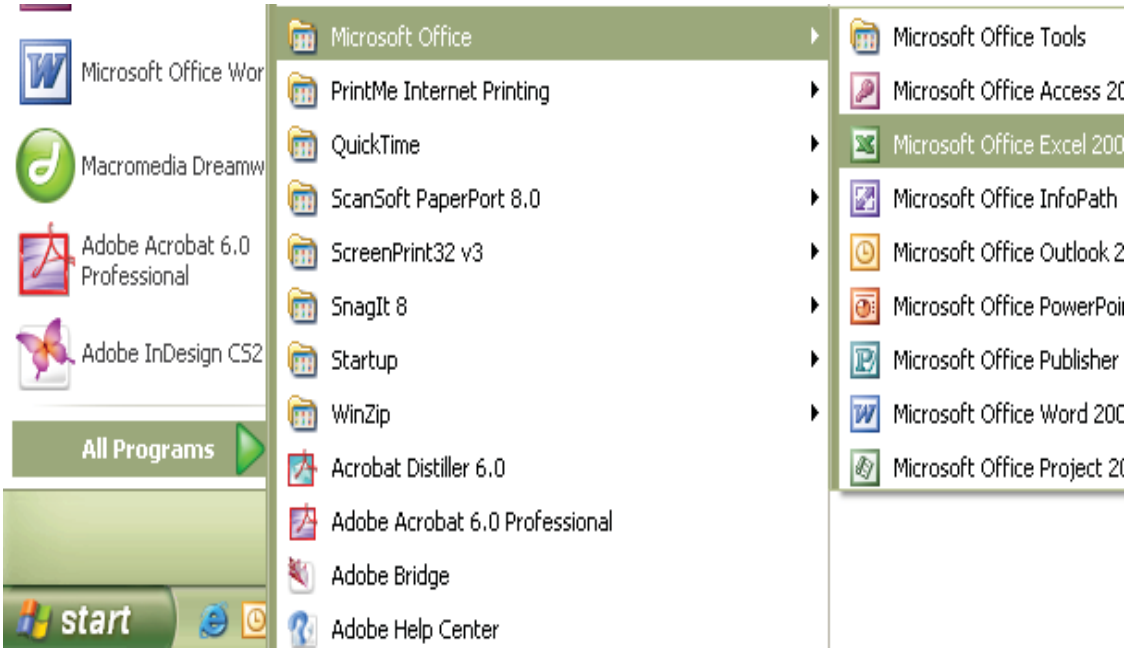
5. **Forecasting**
   - Its automatic recalculation feature enables 'what-if' analysis

Introduction to MS Excel

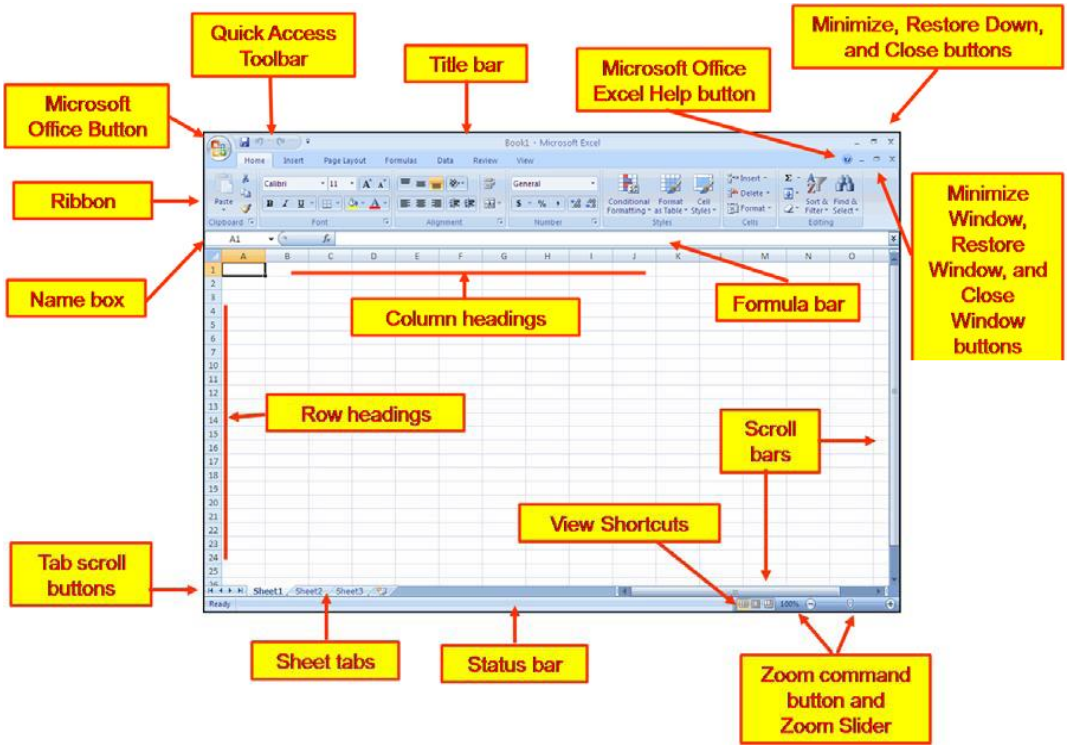
- A product of Microsoft Corporation.
- Versions: Excel 97, 2000, XP, 2003, 2007, 2010

Starting Excel 2007

Step 1 Click the Start button on the taskbar
Step 2 Point to All Programs or Programs
Step 3 Point to Microsoft Office
Step 4 Click Microsoft Office Excel 2007

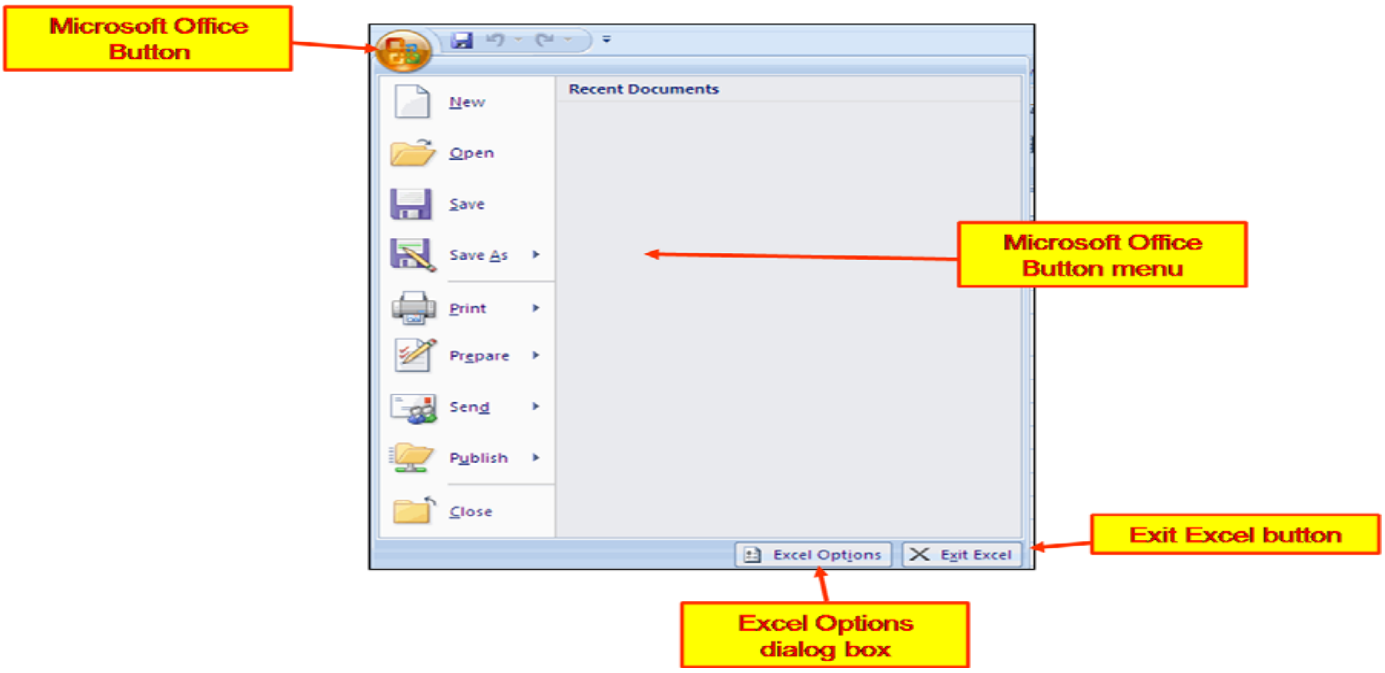


The Excel window

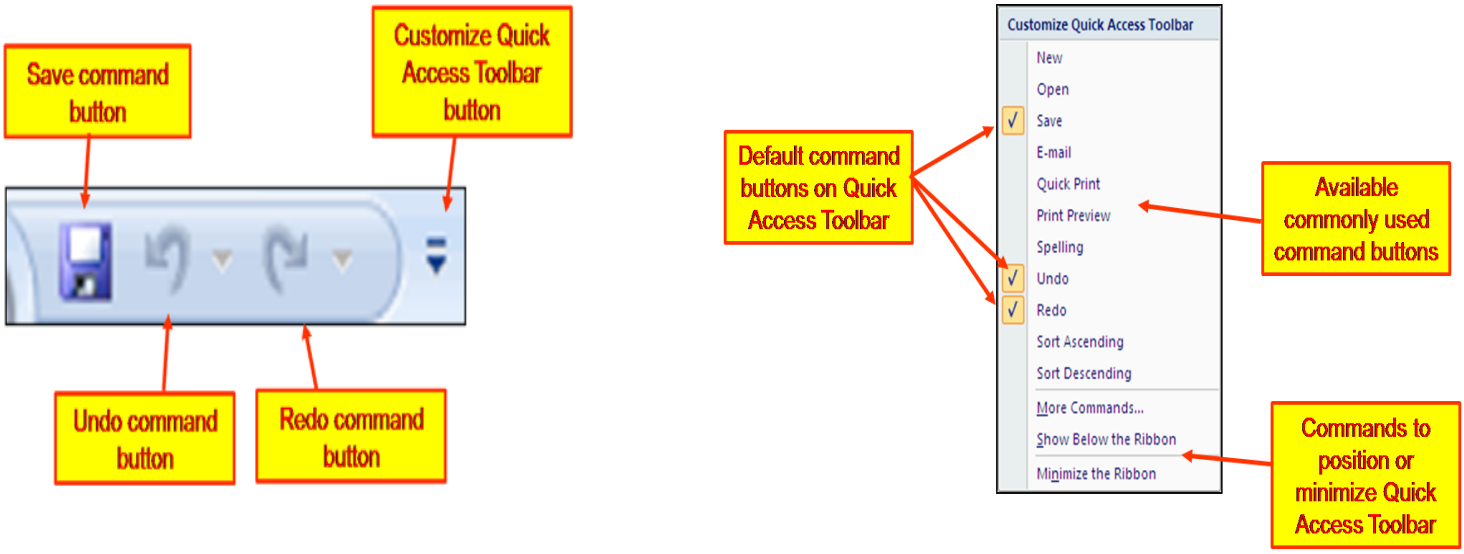


Excel Window Elements

1. **Microsoft Office Button** – contains a pull down menu with most frequently used commands e.g commands used to create, open and save workbooks, and print worksheets

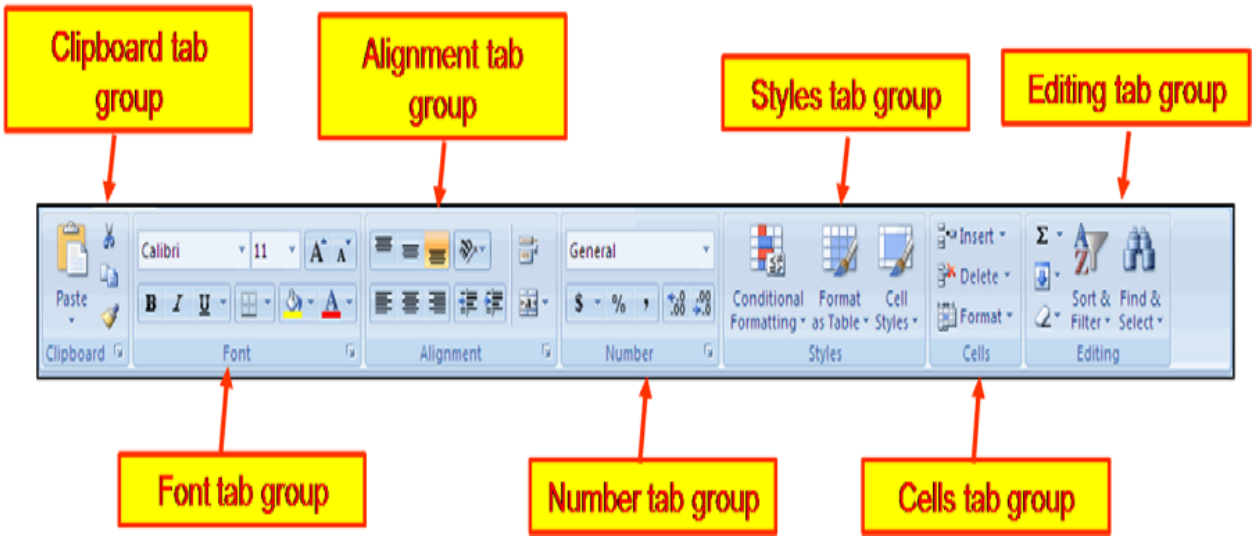


2. **Quick Access Toolbar** – a customizable toolbar



- The **Quick Access Toolbar (QAT) -** provides a faster access to commands.
- By default, the Quick Access Toolbar contains the Save, Undo, and Redo **command buttons** in addition to the Customize Quick Access Toolbar button.
- You can add or remove command buttons on the Quick Access Toolbar to help you quickly perform common tasks.

3. **Title bar** – contains the name of the workbook and the name of the software
4. **Microsoft Office Excel Help button** – used to access Excel Help.
5. **Minimize Window button** – minimizes the current workbook to a title bar icon inside the Excel window.
6. **Restore Window button** – restores the active workbook to a smaller window inside the Excel window.
7. **Close Window button** – closes the active workbook.
4. **Scroll bars** – vertical and horizontal scroll bars used to change the vertical or horizontal view of worksheet areas
5. **Status bar** – a customizable bar below the worksheet area that is used to display various messages, the View Toolbar, the Zoom button and the Zoom Slider.
6. **View Shortcuts** – contains view command buttons used to change the view of the active worksheet
7. **Zoom button** – a command button used to change the magnification or "zoom" of the worksheet view
8. **Zoom Slider** – a slide control used to change the magnification of "zoom" of the worksheet view
9. **The ribbon**



- The **Ribbon** contains a series of grouped command buttons organized around specific tasks.
- There are 3 parts to the ribbon – tabs, groups and commands.

(i) **Ribbon** – designed to be task oriented.
(ii) **tab group** – divides a task into subtasks
(iii) **Command** – carries out a command operation or displays a command menu.

10. The **Name Box-** shows the cell reference of the active cell in the worksheet.
11. The **Formula Bar-** shows the contents of the active cell.
12. **Column Headers -** are the letters only at the top of the worksheet.
13. **Row Headers -** are the numbers on the left side of each row of the worksheet.
14. **Active Cell -** is the currently selected cell, displayed with a thick black border around the cell.
15. **Status bar-**provides a message area, for example the Caps Lock or Num Lock "on" warning message, in addition to displaying the View Shortcuts, the Zoom command button, and the Zoom Slider.
16. **Sheet Tabs –**

- Identify the **current** worksheet.
- Used to navigate from one worksheet to another.

Excel Terminology

1. **Cell** – intersection of a row and a column.
2. **Range** – a group of cells
3. Active cell – highlighted by thick borders.
   - location for typing into a worksheet.
4. **Worksheet**- MS Excel working area.

- Consists of rows and columns
- Contains 1,048,576 horizontal rows (numbered 1 through 1048576) and 16,384 vertical columns from column A to column XFD.

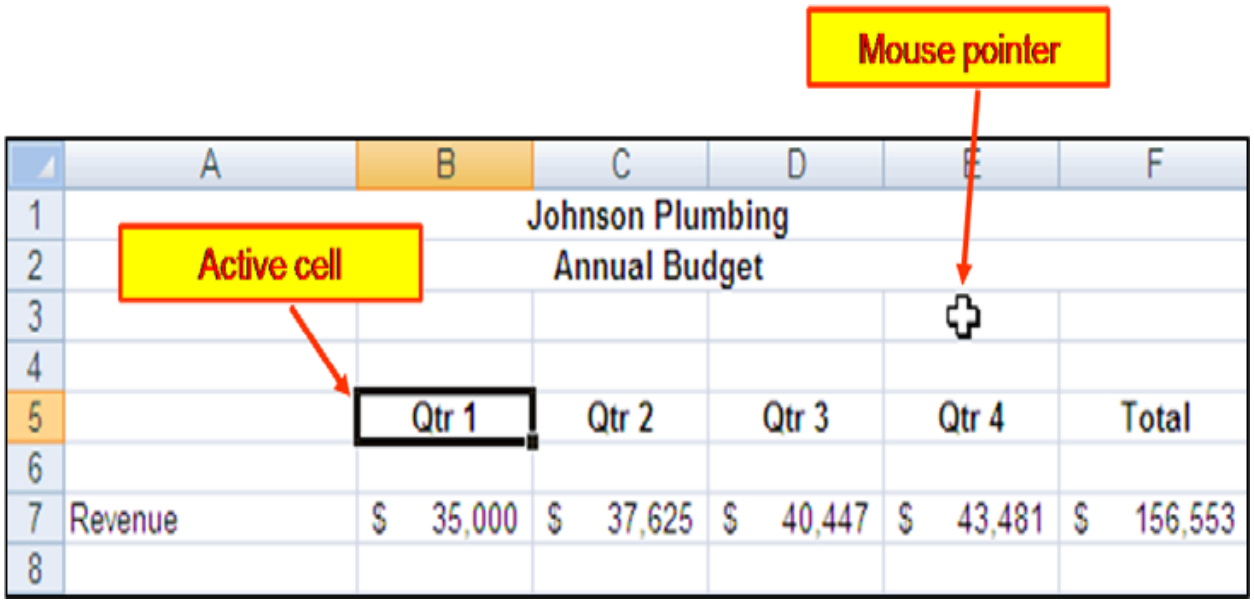
5. **Workbook** – refers to an MS Excel spreadsheet file.

- By default, consists of 3 worksheets.

The Excel Cell Referencing System

- Each cell has a unique address.
- An address consists of column letter and row number.
- There are two cell referencing styles, the:
  (i) A1 style - An address consists of column letter and row number e.g. B3, D2 etc.
  (ii) R1C1 style – both the row and the column are numbered e.g. R2C4 etc.

Navigating in a Worksheet



- The **home cell – cell A1.**
- You can use the mouse pointer to navigate from one cell to another, thereby making the destination cell the active cell.

Keyboard shortcuts for navigating in a worksheet

To Navigate:	Press:
Up one cell	UP ARROW
Down one cell	DOWN ARROW
Right one cell	TAB or RIGHT ARROW
Left one cell	SHIFT + TAB or LEFT ARROW
To the first active cell in the current row	HOME
To the last active cell in the current row	END and then ENTER
Down one page	PAGE DOWN
Up one page	PAGE UP
To cell A1	CTRL + HOME
To the cell in the lower-right corner of the active area of the worksheet	CTRL + END or END and then HOME
To the last cell a blank column	END + DOWN ARROW
To the last cell in a blank row	END + RIGHT ARROW
To the first cell in blank column	END + UP ARROW
To the first cell in a blank row	END + LEFT ARROW

Excel Data Types

1. **Labels**
- Any text and alphanumeric data
- Used to make worksheet data more readable.
2. **Text**
- Any text and alphanumeric data
- Cannot be manipulated mathematically
3. **Numbers**

- Numerical values that can be manipulated mathematically

4. **Date**

- Calendar values

5. **Time**

- Time values

6. **Formula**

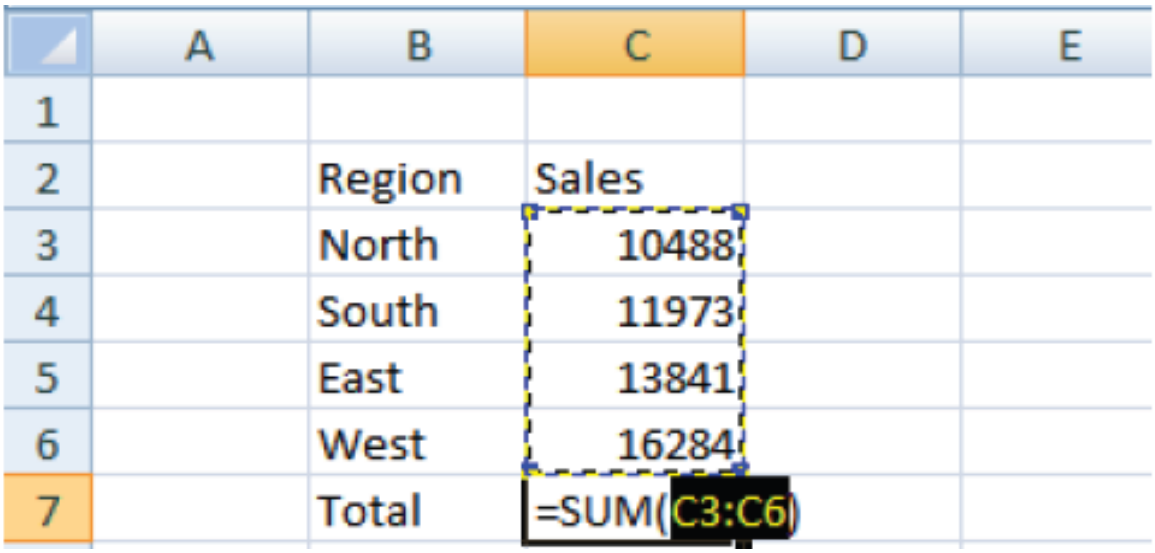
- User defined mathematical expression

7. **Function**

- Excel inbuilt mathematical/text operations

Entering Text and Numbers

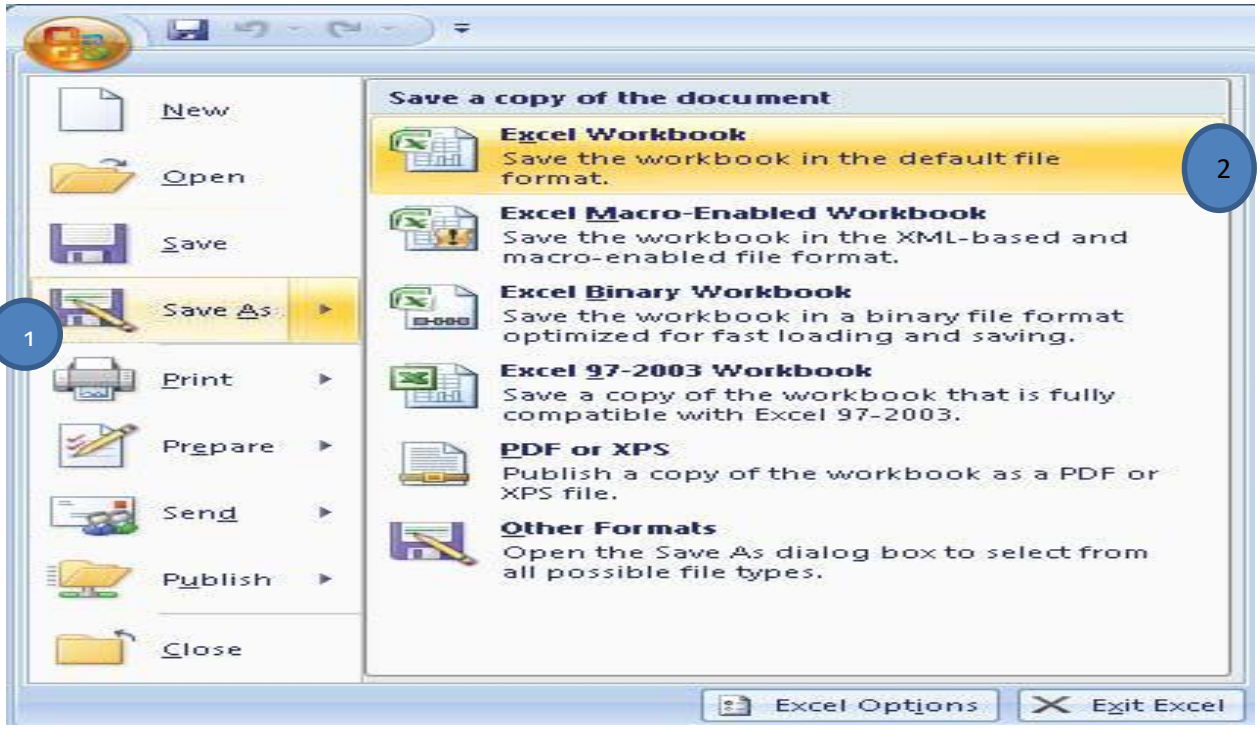
- Make the appropriate cell the active cell and type in data e.g. B2 below and type the word **Region**



	A	B	C	D	E
1					
2		Region	Sales		
3		North	10488		
4		South	11973		
5		East	13841		
6		West	16284		
7		Total	=SUM(C3:C6)		

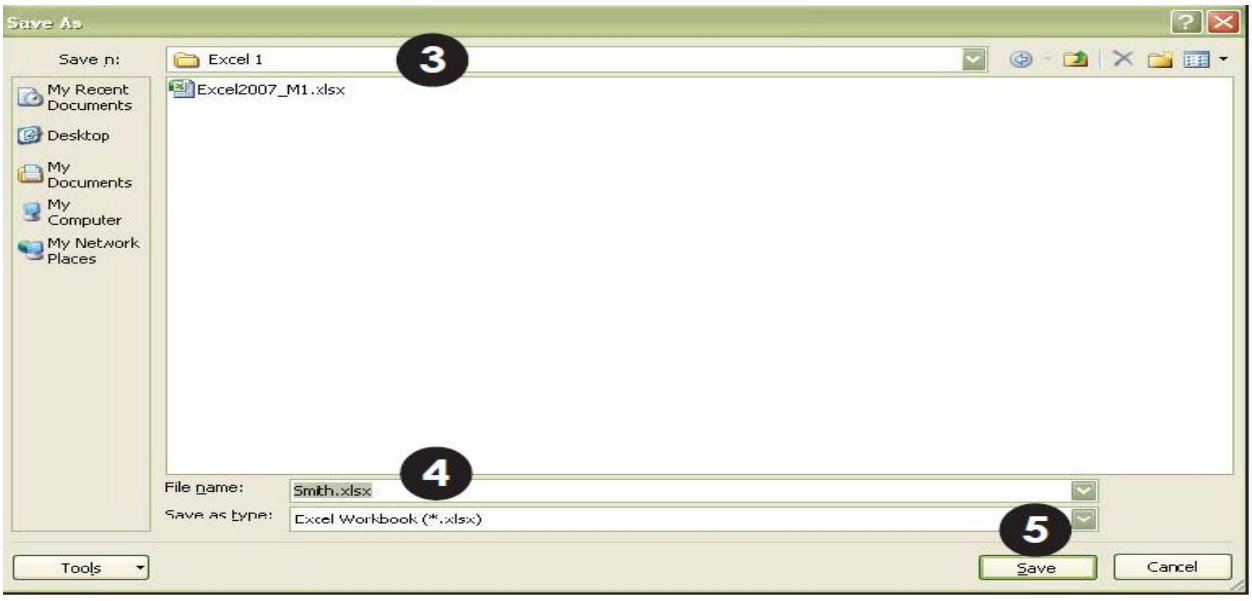
- By default, text is aligned to the left while numbers to the right.

Saving a Workbook



Steps

1. From the **Office Button,** select **Save As.**
2. Select the file type. (Excel Workbook)
3. Select the location/folder where you would like to save the workbook. e.g. **C :> SCS114 > Exceldemo >Sales**
4. Name the file. e.g. Use your last name as the file name.
5. Click **Save.**



Lab 1: Entering Text and Numbers

1. Start a new MS Excel session
2. Create the worksheet below

	A	B	C	D	E
1					
2		Region	Sales		
3		North	10488		
4		South	11973		
5		East	13841		
6		West	16284		

3. Save it as **SALES** in a folder in drive D:. (Create a folder by your own name now if it does not exist)

Entering numbers with fractions

- To enter a fractional value into a cell, leave a space between the whole number and the fraction.
- For example, to enter 67⁄8: enter 6, press spacebar then 7/8 and then press Enter.
- If you have a fraction only e.g. 1⁄8: you must enter a zero first, like this: **0 1/8**
- Otherwise, Excel will likely assume that you're entering a date.
- **N/B**: Excel automatically simplifies fractions e.g 4/8 = 1/2

Lab 2: Entering numbers with fractions

1. Start a new workbook
2. Create the worksheet below
3. Save it as **Fractions** in your folder

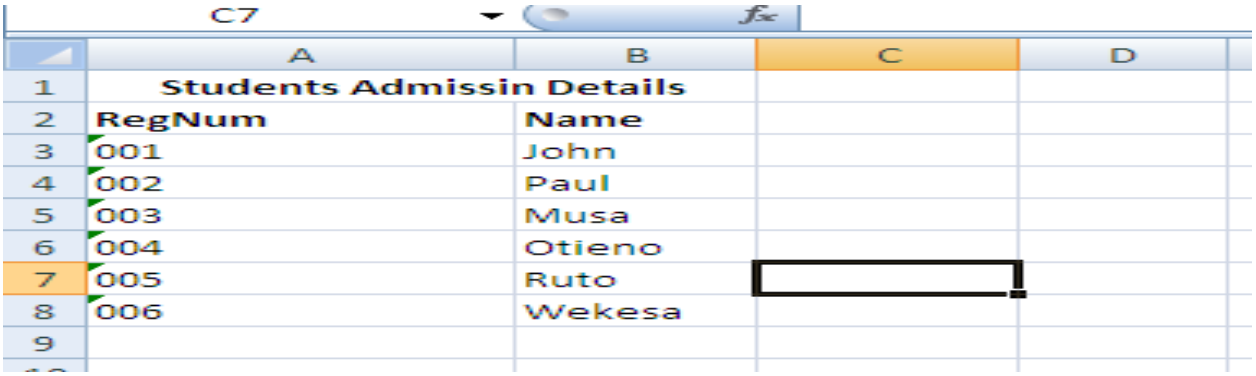
	A	B	C	D
1	Cake Recipe			
2		Ingredient	Amount	Metric Unit
3	1	Milk	1 1/3	litres
4	2	Sugar	1/4	KG
5	3	Salt	1/8	Grams
6	4	Flour	5 1/2	KG
7				

Entering Numbers as Text

- Precede the number with an apostrophe (‘) e.g ‘001, ‘002

Lab3

1. Start a new workbook session
2. Create the worksheet below
3. Save it as **text** in your folder



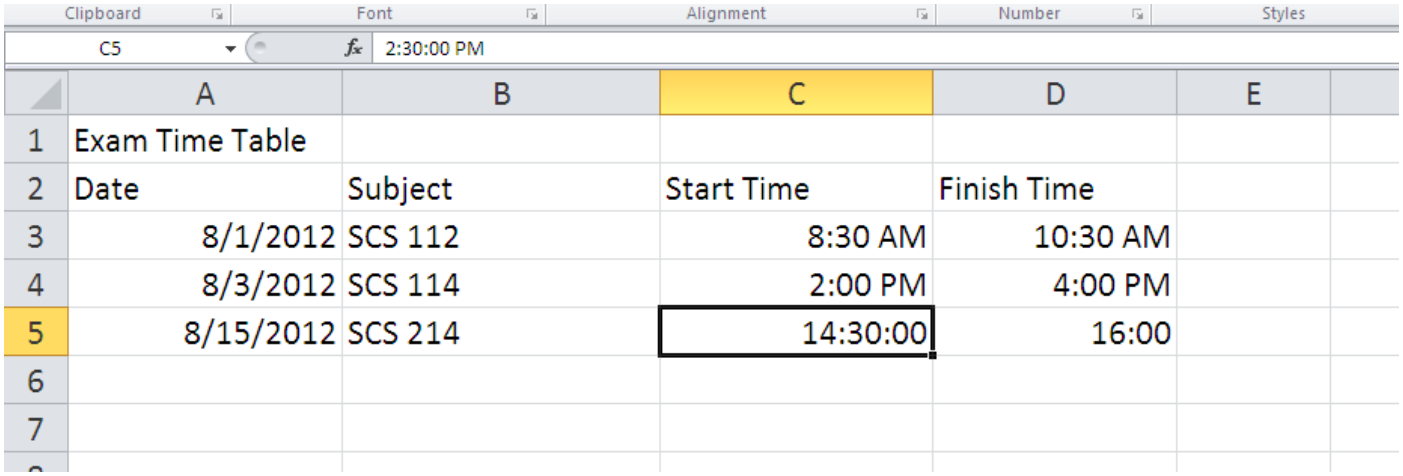
	A	B	C	D
1	Students Admissin Details			
2	RegNum	Name		
3	001	John		
4	002	Paul		
5	003	Musa		
6	004	Otieno		
7	005	Ruto		
8	006	Wekesa		
9				

Entering Date/Time Data

- Excel automatically recognizes valid date/time data type.
- Examples of valid date formats: 11/6/05, 6-Nov-05, 6-Nov, Nov 05
- Examples of valid time formats: 21:41, 21:41:35, 9:41 AM, 9:41:35 PM
- There must be a space before AM/PM

Lab 4: Entering date and time values

1. Start a new workbook session
2. Create the worksheet below
3. Save it as **date** in your folder



	A	B	C	D	E
1	Exam Time Table				
2	Date	Subject	Start Time	Finish Time	
3	8/1/2012	SCS 112	8:30 AM	10:30 AM	
4	8/3/2012	SCS 114	2:00 PM	4:00 PM	
5	8/15/2012	SCS 214	14:30:00	16:00	
6					
7					

Using AutoFill to enter a series of values

- AutoFill- feature that inserts a series of values or text items in a range of cells.

Procedure

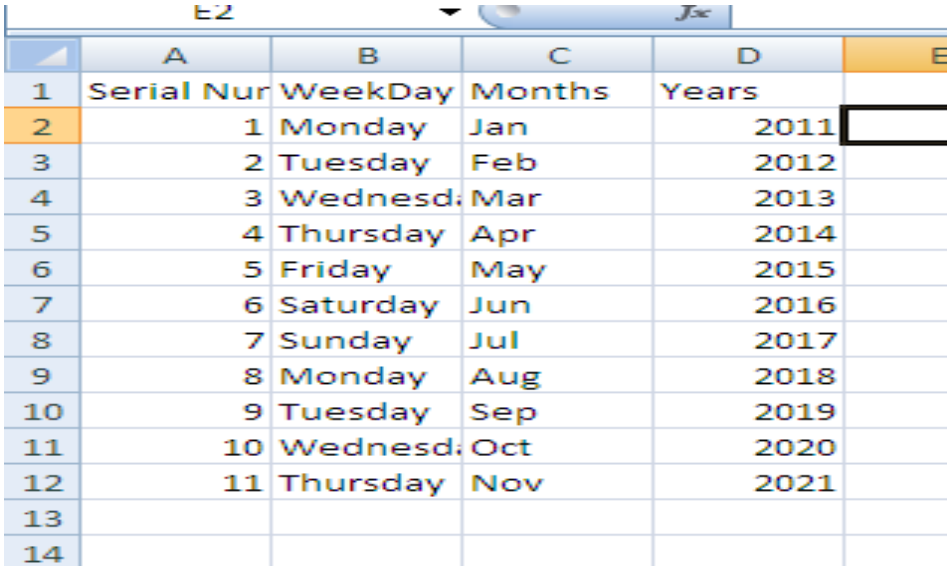
1. Enter the initial value e.g. 1
2. Place the mouse pointer over the auto fill handle
- It changes symbol from a white-plus-sign to a cross-hair
3. Drag the AutoFill handle using the right mouse button.

☐ Excel displays a shortcut menu with additional fill options.

4. Select Fill Series option from the shortcut menu

Lab 6: Using Auto-Fill Feature

1. Start a new workbook session
2. Create the worksheet below by entering the initial value in each column and filling the rest of the values using auto-Fill Feature
3. Save it as **auto-fill** in your folder

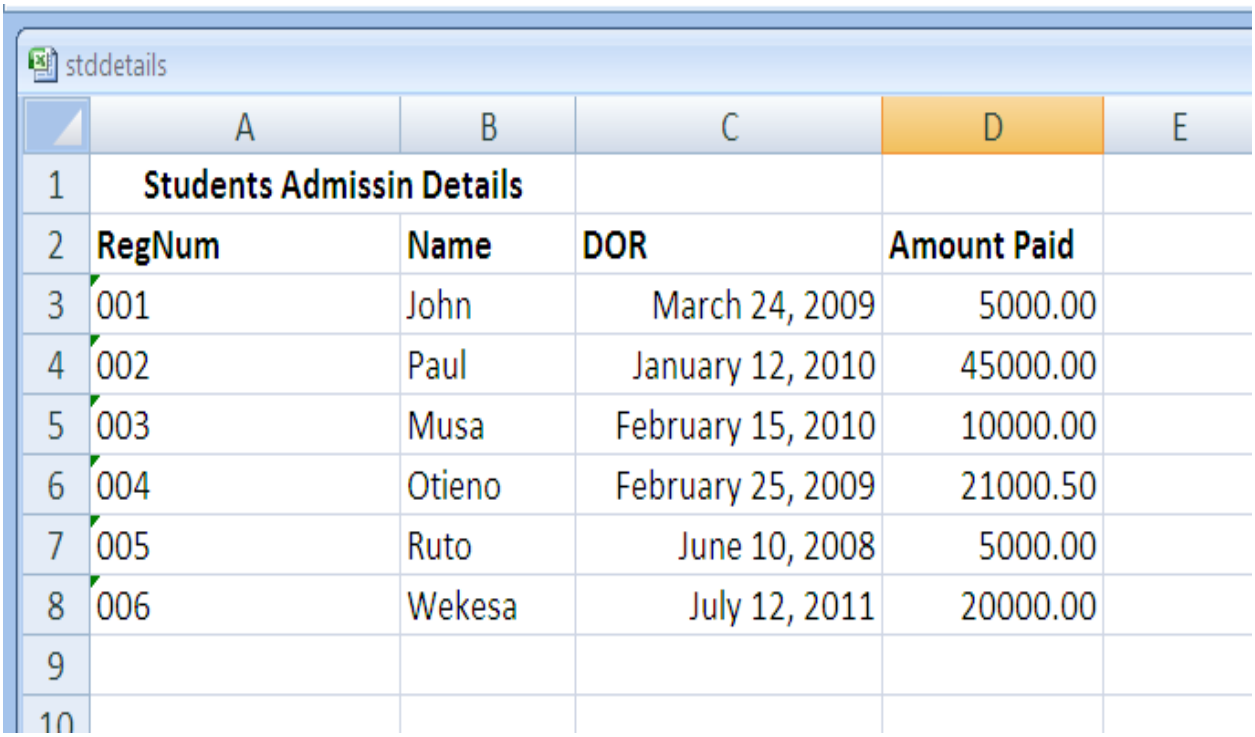


	A	B	C	D	E
1	Serial Nur	WeekDay	Months	Years	
2	1	Monday	Jan	2011	
3	2	Tuesday	Feb	2012	
4	3	Wednesd	Mar	2013	
5	4	Thursday	Apr	2014	
6	5	Friday	May	2015	
7	6	Saturday	Jun	2016	
8	7	Sunday	Jul	2017	
9	8	Monday	Aug	2018	
10	9	Tuesday	Sep	2019	
11	10	Wednesd	Oct	2020	
12	11	Thursday	Nov	2021	
13					
14					

Lab 6: Applying all the Skills

1. Start a new workbook session

2. Create the worksheet below
3. Save it as **Fee** in your folder



stddetails

	A	B	C	D	E
1	**Students Admissin Details**				
2	**RegNum**	**Name**	**DOR**	**Amount Paid**	
3	001	John	March 24, 2009	5000.00	
4	002	Paul	January 12, 2010	45000.00	
5	003	Musa	February 15, 2010	10000.00	
6	004	Otieno	February 25, 2009	21000.50	
7	005	Ruto	June 10, 2008	5000.00	
8	006	Wekesa	July 12, 2011	20000.00	
9					
10					

Formatting Numbers

- Values that you enter into cells normally are unformatted (General format).
- You format the numbers so that they're easier to read or are more consistent in terms of the number of decimal places shown.

1. General

- The General format is Excel's standard number format;.
- Every cell starts out with the same number format: General.
- This format comes with a couple of basic rules:

1. If a number has any decimal places, Excel displays them, provided they fit in the column. If the number's got more decimal places than Excel can display, it leaves out the ones that don't fit. i.e. It rounds up the last displayed digit, when appropriate.
2. Excel removes leading and trailing zeros. Thus, 004.00 becomes 4.

2. Number

- The Number format is like the General format but with three refinements:

1. First, it uses a fixed number of decimal places (which you set).
2. It also allows you to use commas as a separator between groups of three digits.
3. Can display negative numbers displayed with the negative sign, in parentheses, or in red lettering.

3. Currency

- The Currency format displays the currency symbol before the number.
- Always includes commas.
- Also supports a fixed number of decimal places (chosen by you), and it allows you to customize how negative numbers are displayed.

4. Accounting

- The Accounting format is modeled on the Currency format.
- It also allows you to choose a currency symbol, uses commas, and has a fixed number of decimal places.
- The currency symbol's always at the far left of the cell (away from the number), and there's always an extra space that pads the right side of the cell.
- Also, the Accounting format always shows negative numbers in parentheses, which is an accounting standard.
- The number 0 is never shown when using the Accounting format. Instead, a dash (-) is displayed in its place.

5. Percentage

- The Percentage format displays fractional numbers as percentages. For example, if you enter 0.5, that translates to 50%.
- You can choose the number of decimal places to display.

6. Fraction

- The Fraction format displays your number as a fraction instead of a number with decimal places.
- The Fraction format doesn't mean you have to enter the number as a fraction

7. Scientific

- Scientific notation displays the first non-zero digit of a number, followed by a fixed number of digits, and then indicates what power of 10 that number needs to be multiplied by to generate the original number. For example, 0.0003 becomes 3.00×10^{-4} (displayed in Excel as 3.00E-04).
- The number 300, on the other hand, becomes 3.00×10^{2} (displayed in Excel as 3.00E02).

8. Text

- The Text format simply displays a number as though it were text, although you can still perform calculations with it.

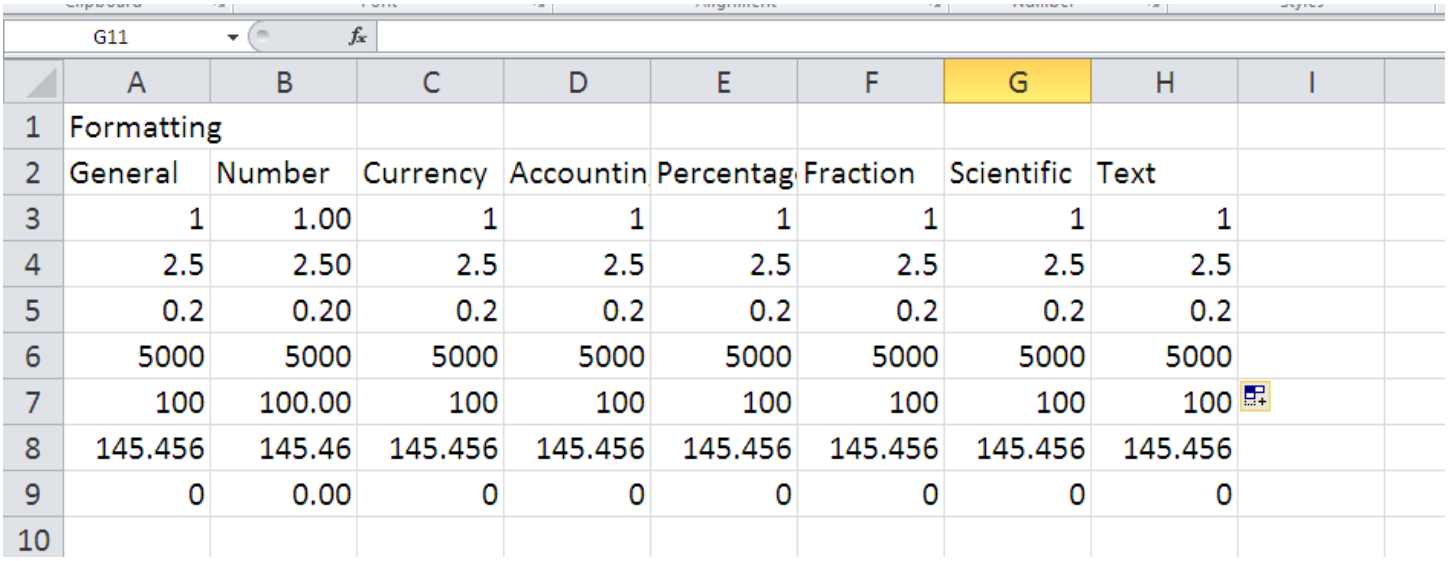
- Excel positions it against the left edge of the column.

Steps for Formatting a Number

1. Select the cell or range of cells
2. Right-click the selection
3. Choose Format Cells option from the context menu.
4. Choose a category
5. Choose a format similar to the one you desire

Lab 3.1

1. Start a new workbook
2. Create the work sheet below



	A	B	C	D	E	F	G	H	I
1	Formatting								
2	General	Number	Currency	Accountin	Percentag	Fraction	Scientific	Text	
3	1	1.00	1	1	1	1	1	1	
4	2.5	2.50	2.5	2.5	2.5	2.5	2.5	2.5	
5	0.2	0.20	0.2	0.2	0.2	0.2	0.2	0.2	
6	5000	5000	5000	5000	5000	5000	5000	5000	
7	100	100.00	100	100	100	100	100	100	
8	145.456	145.46	145.456	145.456	145.456	145.456	145.456	145.456	
9	0	0.00	0	0	0	0	0	0	
10									

3. Format it to appear as shown below
4. Save it as **Format**.

- If a cell displays a series of hash marks (such as #########), it usually means that the column isn't wide enough to display the value in the number format that you selected.
- Either make the column wider or change the number format.

	A	B	C	D	E	F	G	H
1	Formatting							
2	General	Number	Currency	Accounting	Percentage	Fraction	Scientific	Text
3	1	1.00	$1.00	$ 1.00	100%	1	1.0E+00	1
4	2.5	2.50	$2.50	$ 2.50	250%	2 1/2	2.5E+00	2.5
5	0.2	0.20	$0.20	$ 0.20	20%	1/5	2.0E-01	0.2
6	5000	5,000.00	$5,000.00	$ 5,000.00	500000%	5000	5.0E+03	5000
7	100	100.00	$100.00	$ 100.00	10000%	100	1.0E+02	100
8	145.456	145.46	$145.46	$ 145.46	14546%	145 31/68	1.5E+02	145.456
9	0	0.00	$0.00	$ -	0%	0	0.0E+00	0
10								

Creating Formula

- A **formula** is a mathematical expression that returns a value
- A formula is written using **operators** that combine different values, returning a single value that is then displayed in the cell.
- The most commonly used operators are **arithmetic operators.**

Excel Arithmetic Operators

Operator	Name	Example	Result
+	Addition	=1+1	2
-	Subtraction	=1-1	0
*	Multiplication	=2*2	4
/	Division	=4/2	2
^	Exponentiation	=2^3	8
%	Percent	=20%	0.20

Operator Precedence

Symbol	Operator	Precedence
^	Exponentiation	1
*	Multiplication	2
/	Division	2
+	Addition	3
–	Subtraction	3
&	Concatenation	4
=	Equal to	5
<	Less than	5
>	Greater than	5

Excel reads a formula containing these operators from left to right and performs the calculations following these strict rules of precedence:

1. Parenthetical calculations first
2. Division or multiplication next *in the order in which the calculations appear from left to right*
3. Addition or subtraction next *in the order in which the calculations appear from left to right*

- For example, consider the following formula:

=5 + 2 * 2 ^ 3 - 1

To arrive at the answer of 20, Excel first performs the exponentiation (2 to the power of 3):

=5 + 2 * 8 - 1

and then the multiplication:

=5 + 16 - 1

and then the addition and subtraction:

=20

- To control this order, you can add parentheses.
- 5 + (2 * (2 ^ 3)) - 1 = 20
- 5 + 2 * 2 ^ (3 - 1) = 13
- (5 + 2) * 2 ^ 3 - 1 = 55
- (5 + 2) * 2 ^ (3 - 1) = 28

Creating a Simple Formula

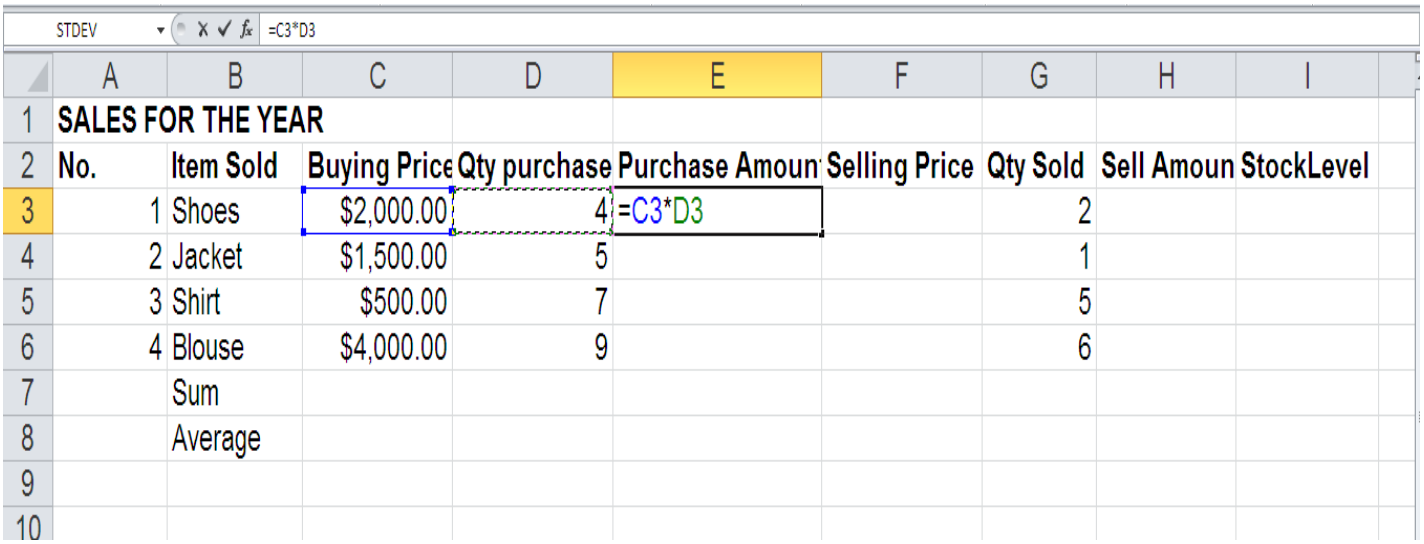
- A formula is expressed by reference to cell addresses e.g. = A1+ A2
- Must be preceded by an equal (=) sign.

Copying a Formula

- Drag the **Autofil**l handle through the cells that the formula is to be copied.
- **Alternatively**
  1. Right click on the cell that contains the formula
  2. Make cell where the formula is to be copied the active cell
  3. Right click on the active cell (cell where the formula is to be copied)
  4. Select Paste from the Shortcut Menu

Lab 3.1

1. Start a new workbook
2. Create the work sheet below
3. Enter formula cell E3 as shown
4. Press enter to view the answer
5. Copy the formula to fill the Purchase Amount for the other items
6. Save it as **STOCK**

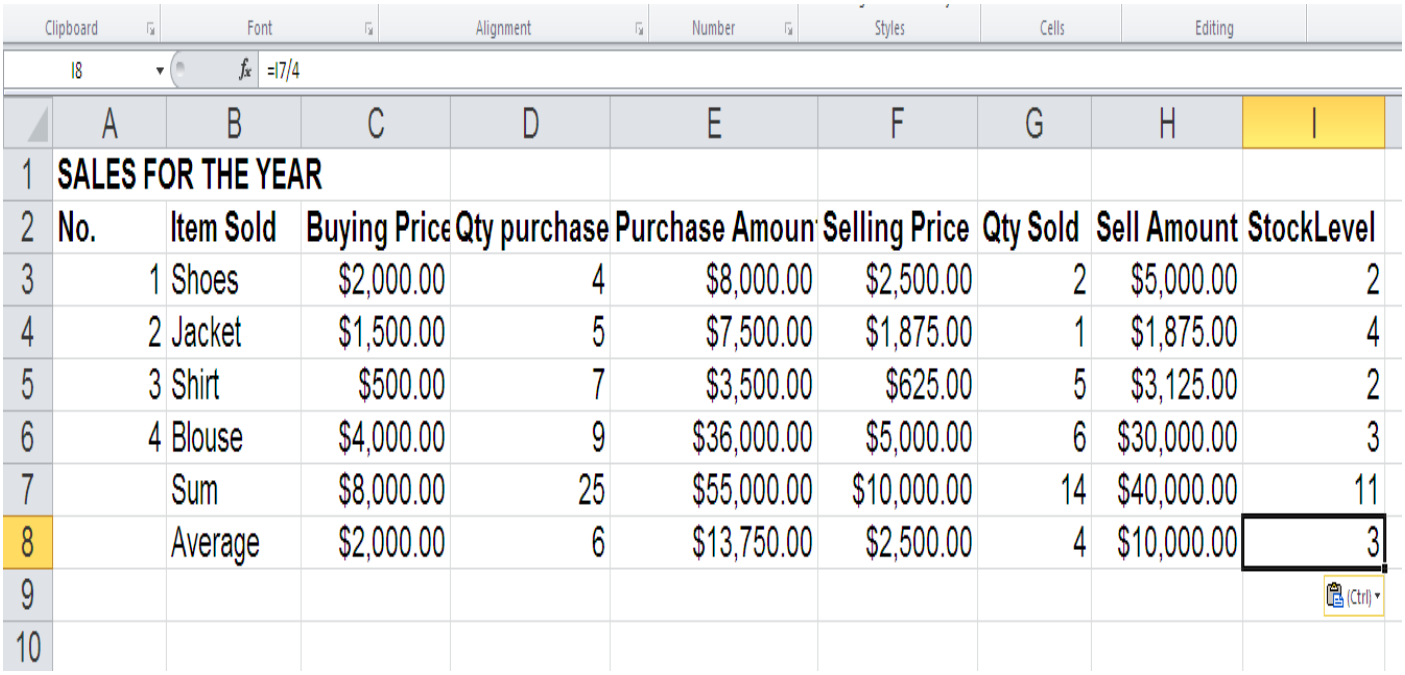


	A	B	C	D	E	F	G	H	I
1	SALES FOR THE YEAR								
2	No.	Item Sold	Buying Price	Qty purchase	Purchase Amoun	Selling Price	Qty Sold	Sell Amoun	StockLevel
3	1	Shoes	$2,000.00	4	=C3*D3		2		
4	2	Jacket	$1,500.00	5			1		
5	3	Shirt	$500.00	7			5		
6	4	Blouse	$4,000.00	9			6		
7		Sum							
8		Average							
9									
10									

7. Set the Selling Price such that a profit of 25% is realized. (In Cell F3 enter the formula: =C3*1.25)

8. Copy the formula to down to cell F6
9. Find the Sell amount for each Item (In Cell H3 enter the formula: =F3*G3)
10. Copy the formula down to H6
11. Find the Stock level for each Item (Qty Purchased – Qty Sold)
12. Copy the formula down to H6
13. Find the summation for all the values
14. Find the average for all the values. Format the values appropriately e.g. quantity must be a whole number while monetary values should be to 2 decimal places.
15. Resave the workbook.

- Your worksheet should look like the one below.



	A	B	C	D	E	F	G	H	I
1	SALES FOR THE YEAR								
2	No.	Item Sold	Buying Price	Qty purchase	Purchase Amoun	Selling Price	Qty Sold	Sell Amount	StockLevel
3	1	Shoes	$2,000.00	4	$8,000.00	$2,500.00	2	$5,000.00	2
4	2	Jacket	$1,500.00	5	$7,500.00	$1,875.00	1	$1,875.00	4
5	3	Shirt	$500.00	7	$3,500.00	$625.00	5	$3,125.00	2
6	4	Blouse	$4,000.00	9	$36,000.00	$5,000.00	6	$30,000.00	3
7		Sum	$8,000.00	25	$55,000.00	$10,000.00	14	$40,000.00	11
8		Average	$2,000.00	6	$13,750.00	$2,500.00	4	$10,000.00	3
9									
10									

Types of Cell References

- There are three types of references:

1. **Relative**: The row and column references can change when you copy the formula to another cell.

- Is the default cell reference mode.
- Example: A2

2. **Absolute**: The row and column references do not change when you copy the formula.

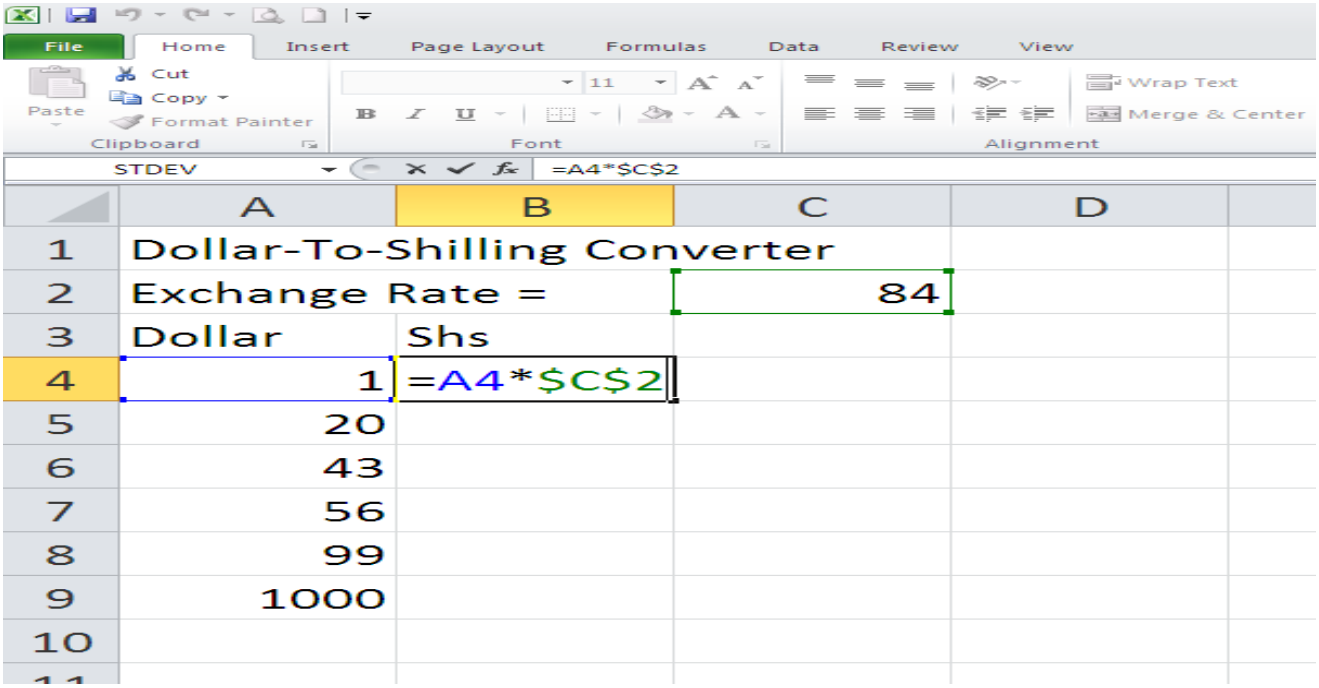
- Necessary when there is a constant in a formula.
- Both the column letter and row number are preceded by the dollar ($) sign
- Example: A2

3. **Mixed**: Either the row or column reference is relative, and the other is absolute.

- Example: A$2, $A2

Lab 3.2

1. Start a new workbook
2. Create the work sheet below
3. Enter formula cell b4 as shown
4. Copy the formula downwards up to cell B9
5. Save the workbook as **Dollar**.



	A	B	C	D
1	Dollar-To-Shilling Converter			
2	Exchange Rate =		84	
3	Dollar	Shs		
4	1	=A4*C2		
5	20			
6	43			
7	56			
8	99			
9	1000			
10				

Common Formula Errors

1. **#VALUE!**
   - You used the wrong type of data. E.g. you might have used a function or created a simple arithmetic formula with a cell that contains text instead of numbers.
2. **#NAME?**
   - Excel can't find the name of the function you used.
   - This error code usually means you misspelled a function's name.
3. **NUM!**
   - This error code appears when a calculation produces a number that's too large or too small for Excel to deal with.
4. **#DIV/0**
   - You tried to divide by zero.
   - This error code also appears if you try to divide by a cell that's blank, because Excel treats a blank cell as though it contains the number 0 for the purpose of simple calculations with the arithmetic operators.
5. **#REF!**
   - Your cell reference is invalid.
   - This error most often occurs if you delete or paste over the cells you were using.
6. **#N/A**
   - The value isn't available.
   - This error can occur if you try to perform certain types of lookup or statistical functions that work with cell ranges.
7. **#NULL!**
   - You used the intersection operator incorrectly.
   - The intersection operator finds cells that two ranges share in common. This error results if there are no cells in common.

8. **########**

- Excel has successfully calculated your formula. However, the formula can't be displayed in the cell using the current number format.
- To solve this problem, you can widen the column, or possibly change the number format.

Functions

- Inbuilt MS Excel text or mathematical operation that returns a value given a range of values (arguments).
- Identified by its name e.g. SUM (), PRODUCT (), etc.

Function Categories

- Functions are grouped into broad categories by some common features among them.

1. ***Financial***

- Analyze investments including appreciation, depreciation, compound interest etc.

2. ***Date & Time***

- Manipulates date and time values.

3. ***Math & Trig***

- Includes general math and trigonometric functions .

4. ***Statistical***

- Performs calculations on list of values.

5. ***Lookup & reference***

- A *lookup formula essentially returns a value from a table by looking up another* related value.

6. ***Database***

- Performs statistical calculations and queries on databases.

7. ***Logical***

- Capable of making a decision based on the outcome of a Boolean expression.

8. ***Information***

- Returns information about a cell e.g. the formatting features applied to the cell.

9. ***Engineering***

- Includes common engineering calculations

10. ***Text***

- Manipulates text data

General Mathematical functions

1. SUM()
2. PRODUCT()
3. EXP()
4. POWER()
5. ROUND()
6. SQRT()

SUM ( )

- Adds up a group of cells.
- Format: =SUM(range)
- Range can be specified in 2 ways:
  (i) =SUM(A1,A2) -adds two cells.
  (ii) =SUM(A2:A12)- adds the range of 11 cells from A2 to A12.

PRODUCT ()

- The PRODUCT( ) function takes a list of numbers, multiplies them together, and gives the result.
  (i) =PRODUCT(A1,A2,A3)
  (ii) =PRODUCT(A1:A10)
- Takes a range of values as its argument

Rounding Numbers

1. ROUND( )

- Rounds a numeric value to a specified number of significant figures e.g. decimal places.
- **Format:** ROUND(value,d.p.)
- **For example**
- =ROUND(3.987, 2) The result is 3.99.
- If you specify 0 for the number of d.p., then Excel rounds to the nearest whole number.

2. ROUNDDOWN( )

- **Rounds numbers down, towards zero.**
- the result of ROUNDDOWN(1.9, 0) is 1,

3. ROUNDUP( ):

- Rounds numbers up, away from zero.
- the result of ROUNDUP(1.1, 0) is 2

POWER()

- POWER( ) works out exponents.
- =POWER(2,3) => 8
- Takes two arguments, the base and the index.

SQRT()

- SQRT() finds the square root of a number.
- =SQRT(9)=->3
- Takes a single argument

Statistical Functions

1. COUNT()
2. MAX()
3. MIN()
4. LARGE()
5. SMALL()
6. RANK()
7. AVERAGE()
8. MEDIAN()
9. MODE()

Counting Values

1. **COUNT ()**
   - Returns the number of cells that contain a numeric value or date value.
   - Format: = COUNT(Range)
   - Example: =COUNT(A1:A10)
   - Function ignores blank cells and cells with text data.

2. **COUNTA ()**

- Returns the number of cells with any data type.
- Used to determine the number of nonblank cells.
  - Format: = COUNT(Range)
  - Example: =COUNTA(A1:A10)
- Function ignores blank cells

3. **COUNTBLANK ()**
   - Returns the number of blank cells
   - Format: = COUNT(Range)
   - Example: =COUNTBLANK(A1:A10)

Maximum and Minimum Values

1. **The MAX( )**

- Pick the largest value out of a series of cells.
- Format: =Max(range)
- Example: =Max(A1:A10)

2. **MIN( )**

- Returns smallest value out of a series of cells.
- Format: =Min(range)
- Example: =Min(A1:A10)

Note:

1. The **MAX( )** and **MIN( )** functions ignore any non-numeric content, which includes text, empty cells, and Boolean (true or false) values.
2. Excel includes dates in MAX( ) and MIN( ) calculations because it stores them internally as the number of days that have passed since a particular date.

Ranking Your Numbers

1. **LARGE( )**

- Returns the k-th largest value in a list e.g. the 5^{th} largest value in a list.
- Example: =Large(A1:A10,5)

2. **SMALL()**

- Returns the k-th smallest value in a list e.g. the 5^{th} smallest value in a list.
- Example: =SMALL(A1:A10,5)
- Takes two arguments: range and position in the list (range).

3. **RANK( )**

- Function finds where a specific value falls in the list.
- Format : =RANK(number, range, [order_type])
- Example :

  =RANK(A1,A1:A10) – ascending order
  =RANK(A1,A1:A10,1) – descending order

Measuring Central Tendency

1. **AVERAGE( )**

- Finds the mean of a list of values
- Format: =AVERAGE(A1:A10)
- Takes one argument: the range of values.
- Function ignores all empty cells or text values.

2. **MEDIAN( )**

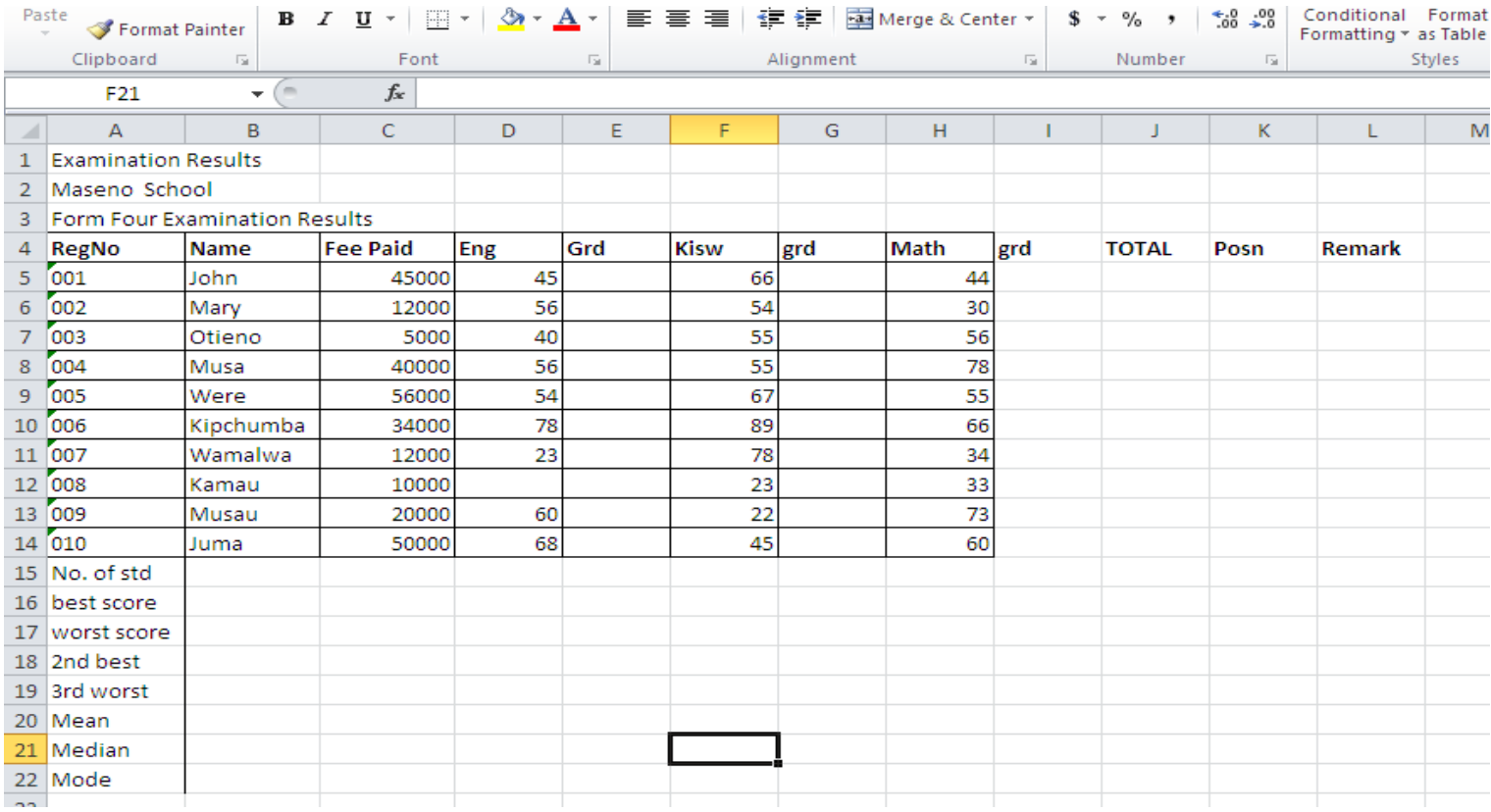
- Finds the median of a list of values.
- If the list is ordered in ascending order, the median is the value that lies in the middle position.
- Format: =MEDIAN(A2:A12)

3. **MODE( )**

- Returns the value that appears the highest number of times in a list (range) of values.
- Format: =MODE(A1:A10)
- Takes one argument: the range.
- It ignores text values and empty cells

Lab 5.1: Functions

1. Create the workbook below
2. Use functions to fill the gaps.
3. Save it as **Exam.**



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Examination Results												
2	Maseno School												
3	Form Four Examination Results												
4	**RegNo**	**Name**	**Fee Paid**	**Eng**	**Grd**	**Kisw**	**grd**	**Math**	**grd**	**TOTAL**	**Posn**	**Remark**	
5	001	John	45000	45		66		44					
6	002	Mary	12000	56		54		30					
7	003	Otieno	5000	40		55		56					
8	004	Musa	40000	56		55		78					
9	005	Were	56000	54		67		55					
10	006	Kipchumba	34000	78		89		66					
11	007	Wamalwa	12000	23		78		34					
12	008	Kamau	10000			23		33					
13	009	Musau	20000	60		22		73					
14	010	Juma	50000	68		45		60					
15	No. of std												
16	best score												
17	worst score												
18	2nd best												
19	3rd worst												
20	Mean												
21	Median												
22	Mode												