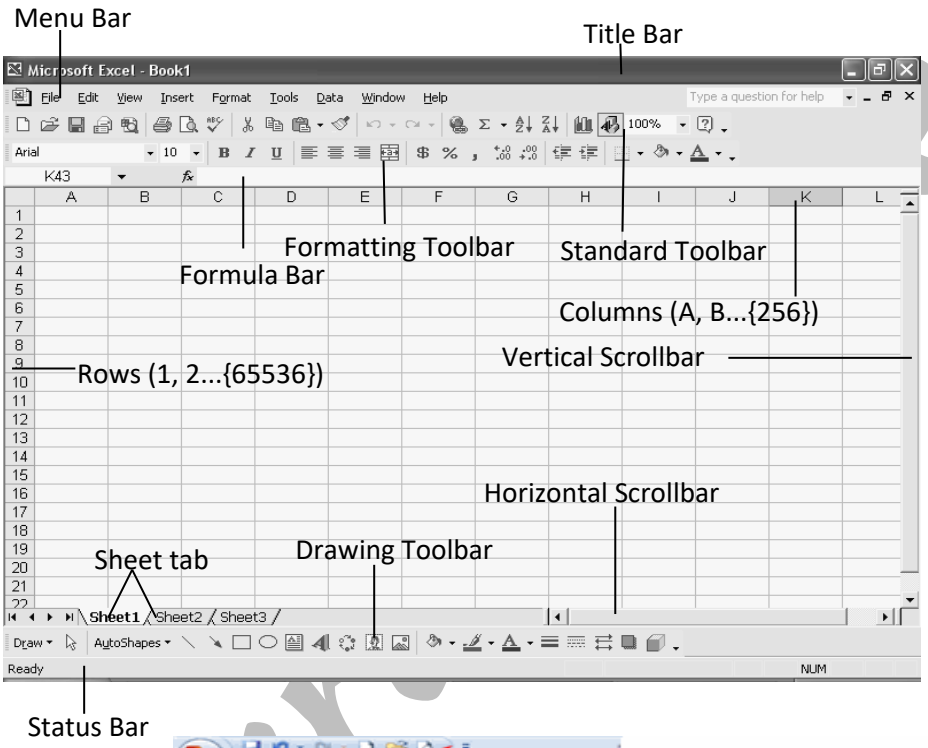
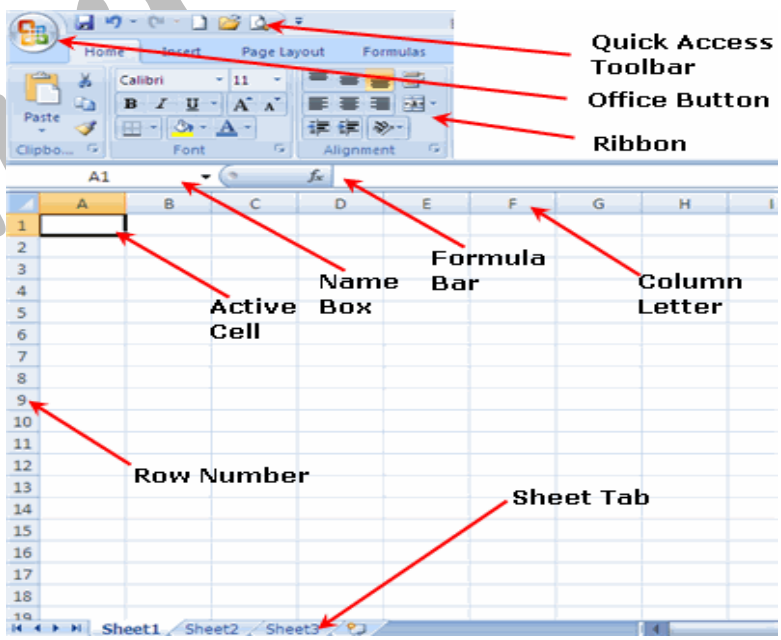
Spreadsheet Application (MICROSOFT EXCEL)

Spreadsheet software is the software that works with data on the sheet. MS Excel is a spreadsheet program developed by Microsoft Corporation. It is used for storing data, creating table, chart, using formula and performing other data related tasks. Ms Excel Workbook till window 2003 has extension .xls while 2007 and later has extension .xlsx. Excel Template has extension .xlt

List of spreadsheet package

StarOffice/OpenOffice Calc	Lotus 1-2-3	Quattro Pro	PlanMaker
AppleWorks	Ability Spreadsheet	Mariner Calc	KSpread
Gnumeric	Thinkfree Office	Gs-Calc	





Handout: Spreadsheet (Computer Operator)

Some terminologies

Workbook: Collection of worksheets, which stores data
Worksheet: Each sheet with the collection of rows and columns. A workbook has 3 worksheet in default.
Rows: A long horizontal rectangular box (number of rows: 65,536 in excel 2003, 10,48,576 in excel 2007)
Columns: A long vertical rectangular box (number of columns: 256 in excel 2003, 16, 384 in excel 2007)
Cell: Each box created by the intersection of a row and a column.
Active Cell: It is the current cell which is clicked or selected.

Points to be remembered

- ***Default Number formatting***: general
- ***Default alignment***: number - right, text - left
- ***Maximum size of data a cell can hold***: 32767 bytes (characters)
- ***Default row height***: 12.75 pt (2003), 15 pt (2007), **Default Column width**: 8.43 char
- Hold 'Shift' Key to select cell range or group of adjacent cells.
- Hold 'Ctrl' key to select multiple non-adjacent cells.
- A workbook contains 3 sheets by default

Excel data type

There are four data types supported by MS Excel
1. **Value (Number):** All the numeric values (0-9) which are used for calculation
2. **Label (Text):** Alphanumeric value that is not used for calculation. Numeric value can be changed to label with apostrophe (') at the beginning.
3. **Formula:** All formulae that start with equal to (=) sign which calculates and stores value in cell.
[Note: values taken by formula for calculation are known as parameter (arguments)
e.g. =SUM(A2, B2), here A2 and B2 are parameters (arguments)]
4. **Date/Time**: Contains date and time.

Operators and operands

An operator is an expression that performs an operation. Operands are value that involve in operation.

Types of operator

1. **Arithmetic/ Mathematical Operator**: Performs mathematical calculations and returns the result
   + (plus) → Addition
   - (minus) → Subtraction/Negation
   * (asterisk) → Multiplication
   / (forward slash) → Division
   MOD → Modulus (Remainder) / % (percentage)
   ^ (caret) → Exponentiation (Power)
2. **Comparison/Relational Operator**: It compares two values and return either TRUE or FALSE
   = → Equal to
   > → Greater than
   < → Less than
   > = → Greater than or equal to
   < = → Less than or equal to
   <> → Not equal to
3. **Text/String/Concatenation Operator**: Used to combine two string (alphanumeric) values and return result. The process to combine the values is known as concatenation. & (ampersand) is used as string operator
4. **Reference Operator**: Combine range of cells for calculations
   : (colon) → Range Operator
   , (comma) → Union Operator
   Space → Intersection Operator

5. **Logical Operator**: Combine two or more relational operators and return result
   AND : Returns true if all of the conditions are true otherwise returns false
   OR: Returns true if any one of the given conditions is true otherwise returns false
   NOT: Returns true if the condition is false and vice versa

Truth tables for AND, OR

Function	Logic 1	Logic 2	Result
If(and(	True	True	True
	True	False	False
	False	True	False
	False	False	False
If(or(	True	True	True
	True	False	True
	False	True	True
	False	False	False

Sorting: Arrangement of data (records) in ascending or descending based on particular field (column)
Filtering: allows to display only selected categories of data at a time
Advanced Filter: Specifies complex criteria to limit when records are included in the result set of a query.
Wrap Text: Make all text visible within a cell by displaying it on multiple lines.
Number Format: Specifes how the value is displayed on the cell
General: No specific number format
Number: Specifies the number of decimal places, thousand separator and negative number format
Currency: Number of decimal places, negative number and currency symbol
Accounting: Number of decimal places and currency symbol
Date: Date format with location
Time: Time format with location
Percentage: Displays percentage sign after number and can be specified number of decimal Places
Fraction: Displays number in fractions
Scientific:Displays number with scientific notation
Text: Any value in the cell is treated as text
Special: Specifies the format for zip code, phone numbe and security number
Custom: Displays all the number formats
Conditional Formatting: Specifies the format of value based on specific conditions
Chart: Diagrammatic representation of numeric data is known as chart
Column chart: used to compare values across categories
Line chart: used to display trend ove time
Pie chart: Used to display the contribution of each value to a total
Bar chart: Best chart for comparing values
Area chart: emphasize differences between several sets of data over a period of time
Scatter chart: compares pairs of values
Radar chart: used when the categories are not directly comparable
Reference: A reference identifies a cell or a range of cells on a worksheet

REFERENCING METHOD

Relative references: It is default referencing method. If the position of the cell that contains the formula changes, the reference is changed
E.g. =A1+B1
Absolute Reference: If the position of the cell that contains the formula is changed, absolute reference remains same. Dollar Sign ($) is used to fix row and column
E.g: = $A$1+$B$1
Mixed reference: It combination of relative and absolute reference. It has either an absolute column and relative row, or absolute row and relative column. E.g.: =$A1+B$2

Pivot Table: It makes easy to arrange and summarize complicated data and drill down on detail
Print Area: specifies the area for printing
Print Title: Specifies row or column to be repeated on each printed page
Group/Ungroup: to group and ungroup range of cells together
Subtotal: go get the total of multiple rows related together
Text to column: To separate the text typed in a cell into different columns
Remove Duplicate: Remove duplicate row (rows containing same value) from sheet
Data Validation: To allow only required data to be typed on cell
Consolidate: to combine values from multiple range into new single range

WHAT IF ANALYSIS:

Scenario Manager: Allows to create and save different groups of values or scenarios and switch between them.
Goal Seek: Used to find the right input for required result
Data Table: used to see the results of many different possible inputs at the same time.

Save Workspace: used to save all opening workbooks in their size, position on the screen to workspace file so that the screen will look the same in the next time when next time it is opened. File extension of workspace is .xlw
Freeze Panes: Keeps a portion of the sheet visible while rest of the sheet scrolls
Split: Splits the window into multiple resizable panes
Hide: Hides the current window
Transpose: Returns vertical range (row) to horizontal range (column) and vice versa. It is available in paste special command.

DIFFERENT VIEWS

Normal View: Default View
Page Break Preview: Preview of worksheet as it prints.
Custom View: To set the required view of sheet with a name

ERROR CODES:

#DIV/0! → When divided by empty cell or zero
#NAME? → When supplied reference does not exist
#N/A → When the function is not available or function without all required parameters
#NULL! → When incorrect range separator is used
#NUM! → When incorrect argument is supplied
#REF! → When referred cell does not contain any data
#VALUE→When formula contains parameter of wrong data type

DATE/TIME FUNCTION

DATE: Returns date, syntax: DATE (year, month, day)
TIME: Returns time, syntax: TIME (hour, minute, second)
HOUR: Returns hour of time value, syntax: HOUR (serial_number)
MINUTE: Returns minutes of time value, syntax: MINUTE (serial_number)
SECOND: Returns second of time value, syntax: SECOND (serial_number)
NOW: Returns current date and time, NOW()
TODAY: Returns current date, TODAY()
DAY: Returns the day of date , DAY(serial_number)
MONTH: Returns the month of date, MONTH(serial_number)
YEAR: Returns the month of date, YEAR(serial_number)
WEEKDAY: Returns the day of the week
WORKDAY: Returns a date that is a supplied number of working days (excluding weekends and holidays) ahead of a given start date. Syntax: WORKDAY(start_date, days, [holidays])
NETWORKDAYS: Returns the number of whole working days between start_date and end_date. Syntax: NETWORKDAYS(start_date, end_date, [holidays])

Practical Session

Advanced Filter

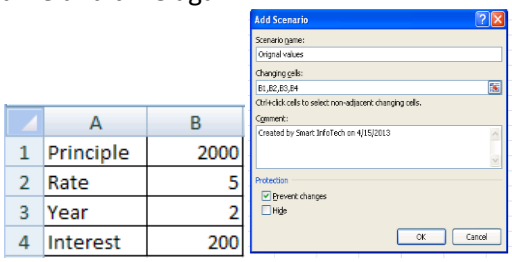
- Select the data
- Inside 'Data' tab click 'Advanced' option under 'Sort & Filter' group
- Type or select the range of data in 'List range'
- Select the criteria for the 'criteria range' [note: criteria should be typed before as in figure]
- OK

Removing duplicate values

- Select the data
- Under 'Data' tab click 'remove duplicates'

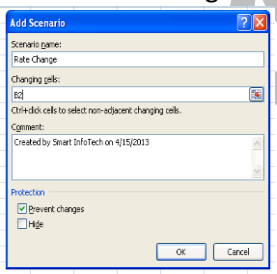
Scenarios

Scenarios are designed to help you quickly switch between different sets of inputs for a model without having to manually type in different values time and time again.



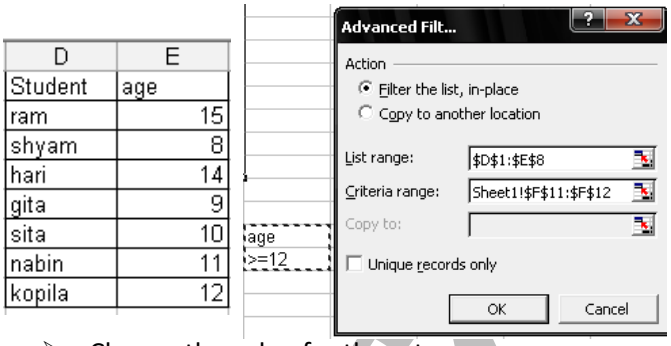
	A	B
1	Principle	2000
2	Rate	5
3	Year	2
4	Interest	200

- Select the data
- Under 'Data' tab Under 'Data Tools' Group click 'What-If Analysis'
- Select 'Scenarios'
- Click 'Add'
- Give name as 'Original'



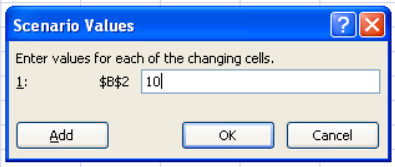
- Choose the cell whose values can be changed (in fig, B1, B2, B3, B4)
- OK
- OK

  Again
- Click 'Add' to add new scenario
- Give name 'Rate Change'
- Select the cell for rate value (here, B2)
- OK

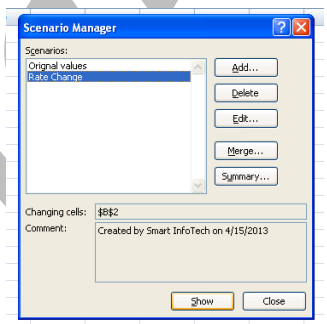


D	E
Student	age
ram	15
shyam	8
hari	14
gita	9
sita	10
nabin	11
kopila	12

- Change the value for the rate



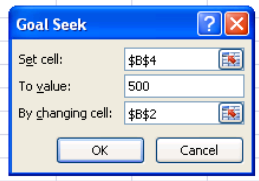
- OK



- Click 'Show' to view the change in interest [Select 'Original' and click 'Show' to view original data]

Goal Seek

This option allows getting the desired output by changing the value of a cell involved in formula



- Select the data
- Under 'Data' tab Under 'Data Tools' Group click 'What-If Analysis'
- Select 'Goal Seek'
- Select the cell to be changed in 'set cell' box
- Give desired value in 'To value' box
- Select the cell whose value should be changed in 'By changing cell'
- OK

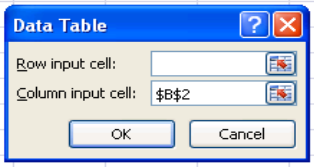
Handout: Spreadsheet (Computer Operator)

Data Table

It is used to create a table with existing cell having formula with different values

	A	B
1	Principle	2000
2	Rate	5
3	Year	2
5		
6	Rate	Interest
7	1	200
8	2	
9	3	
10	4	
11	5	

- Type the data as given
- Select the data with one cell having formula
- Under 'Data' tab Under 'Data Tools' Group click 'What-If Analysis'
- Select 'Data Table'



- In column input cell select the cell with the value of rate (here, B2)
- OK

[Use 'row input cell' if the value is in row]

3D referencing

- Type different data in different sheet in same rows/columns

	A	B
1	January	
2	Keyboard	500
3	Mouse	250
4	Printer	12000
5	Headset	1500
6	CD	100
7	Computer	25000

Sheet 1

	A	B
1	February	
2	Keyboard	1250
3	Mouse	1500
4	Printer	20000
5	Headset	500
6	CD	80
7	Computer	35000

Sheet 2

	A	B
1	March	
2	Keyboard	600
3	Mouse	400
4	Printer	6000
5	Headset	280
6	CD	200
7	Computer	22000

Sheet 3

- Hold 'Shift' key and Select all the sheets with the data

- Use desired formula in a sheet

	A	B
1	March	
2	Keyboard	600
3	Mouse	400
4	Printer	6000
5	Headset	280
6	CD	200
7	Computer	22000
8	Total	=sum(B2:B7)

- Now the formula is applied in all of the sheets

SUMIF and COUNTIF

COUNTIF

- Used to count the number of data depending upon the given condition
- To count the total number of students with grade A
- =COUNTIF($A$2:$A$9,"A")

	A
1	Grade
2	A
3	B
4	A
5	C
6	B
7	A
8	C
9	B

SUMIF

- To get the sum(total) of data depending upon given condition

27	Property	commission
28	10000	1000
29	15000	1500
30	12000	1200
31	100000	10000
32	14000	1400
33	9000	900

-
- To get the total of commission for properties value greater than 12000
- =SUMIF($A$28:$A$33,">12000",$B$28:$B$33)

Data Consolidation

Consolidation is the process of combining values from several ranges of data either from within the same or different workbooks. It can be used to summarize data from different worksheets

	A	B
1	Product A	
2	Jan	150
3	Feb	200
4	Mar	100
5	April	90
6	May	60
7	Jun	85
8	July	105
9	Aug	210
10	Sept	305
11	Oct	110
12	Nov	60
13	Dec	50
14	A Total	1525

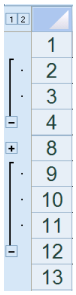
	A	B
1	Product B	
2	Jan	90
3	Feb	60
4	Mar	120
5	April	200
6	May	140
7	Jun	150
8	July	60
9	Aug	230
10	Sept	110
11	Oct	300
12	Nov	100
13	Dec	40
14	A Total	1600

- To get the total of two sheets in new worksheet
- Type the product A data in Sheet 1
- Type the product B data in Sheet
- Click on Sheet 3
- Data > Consolidate
- Select the function 'Sum'
- Select the total of Sheet 1 > Add
- Select the total of Sheet 2 > Add
- OK

Group/Ungroup

To group/ungroup different category of data separately

- Select the rows/columns to group
- Data > Group > Group
- Select 'Row' or 'Column'



- OK

[Grouped data can be expanded or condensed as desired]

VLOOKUP

Searches for a value in the first column of a table array and returns a value in the same row from another column in the table array.

	A	B
1	Particular	Price
2	MOUSE	
3	SPEAKER	

6	Particular	Price
7	Keyboard	300
8	Mouse	300
9	LCD	8000
10	Printer	8500
11	Speaker	500

- Click on B2 cell and type the formula as: =VLOOKUP(A2,$A$7:$B$11,2,FALSE)

Drop Down List

To create drop down list so that value can be chosen from the list

Name	Address	Qualification
Ram	Kathmandu	
Shyam	Pokhara	
Hari	Chitwan	
Gita	Dharan	
Sita	Kathmandu	
Rita	Pokhara	

Master
Bachelor
Inter
SLC
Under SLC

- Type the data as shown
- Type the item for list in next column
- Select the cell range to apply drop down list (here from C2 to C7)
- Under 'Data' tab click 'Data Validation'
- Select 'Data Validation'
- In 'Allow Box' Select 'List'
- Click inside the 'Source' box and select the data list to include in the drop down list

FUNCTIONS

Functions are commands which take data and return a value.

String Function

1. Concatenate - join multiple strings into one string. (up to 30 strings).
"This is a test" = CONCATENATE("this","is","a","test")
2. Substitute - Substitute string function example:
"Monday the 13th" = SUBSTITUTE("Friday the 13th", "Friday", "Monday")
3. Replace - Replace string function example:
"!esting" = REPLACE("testing", 1, 1, "!")
4. Search - Search string function example:
3 = SEARCH("e", "Great!")
5. Value - Value string function example:
3000 = VALUE("$3,000")
6. Len - Len string function example:
4 = LEN("blue")
7. Lower - Lower string function example:
"lower case" = LOWER("LoWeR CaSE")
8. Proper - like Title Case
Proper string function example:
"Hello, world." = PROPER("hello, world.")
9. Day - Day string function example:
15 = DAY("15-Apr-2008")
10. Rept - Rept string function example:
"jjj" = REPT("j", 3)

Handout: Spreadsheet (Computer Operator)

Numeric Functions

Abs : Returns the absolute value of a number. The syntax for the Abs function is: Abs(number) number is a numeric value.
1=absI(-1)

Average: Returns average value. There can be up to 30 values entered

Cos: In Excel, the Cos function returns the cosine of an angle. The syntax for the Cos function is: Cos(number) number is a numeric value.

Count : The syntax for the Count function is: Count(argument1, argument2, ... argument_n) There can be up to 30 arguments.

Even : In Excel, the Even function rounds a number up to the nearest even integer.
4=even(3) -4=even(-3)

Fact : In Excel, the Fact function returns the factorial of a number. E.g. = Fact(5)
Factorial of 5=120 (1*2*3*4*5)
factorial of 4 =24 (1*2*3*4)

Max : Returns Maximum value. There can be up to 30 values entered.

Min : Returns minimum value. There can be up to 30 values entered.

Mod : It returns the remainder. The syntax for the Mod function is: Mod(number, divisor If the divisor is 0, then the Mod function will return the #DIV/0! error.

Odd : It rounds a number up to the nearest odd integer. The syntax: Odd(number

Product : Returns product. Syntax: Product(num1, num2, ...). There can be up to 30 numbers entered.

Round : The syntax for the Round function is: Round(number, digits) number is the number to round. digits is the number of digits to round the number to.

RoundDown: (Always rounds towards 0.) The syntax for the RoundDown function is: RoundDown(number, digits)

RoundUp : (Rounds away from 0.) The syntax for the RoundUp function is: RoundUp(number, digits)

Sign : If the number is positive, the Sign function will return 1. If the number is negative, the Sign function will return -1. If the number is 0, the Sign function will return 0. The syntax for the Sign function is: Sign(number) number is the number that you wish to return the sign for.

Sin : In Excel, the Sin function returns the sine of an angle. The syntax for the Sin function is: Sin(number) number is a numeric value

Sqrt: Returns the square root of a number. The syntax for the Sqrt function is: Sqrt(number) Note: If a negative number is entered in the number parameter, the Sqrt function will return the #NUM! error.

Sum: In Excel, the Sum function adds all numbers in a range of cells and returns the result. The syntax for the Sum function is: Sum(number1, number2, ... number_n) or Sum (cell1:cell2)

SumIf : In Excel, the SumIf function adds all numbers in a range of cells, based on a given criteria. The syntax for the SumIf function is: SumIf(range, criteria, sum_range) range is the range of cells that you want to apply the criteria against. criteria is used to determine which cells to add. sum_range are the cells to sum.

Tan : In Excel, the Tan function returns the tangent of an angle. The syntax for the Tan function is: Tan(number) number is a numeric value.

LOGICAL FUNCTIONS

1. =if (logic / condition, true value, false value)
2. =if (and (logic 1, logic 2,…), true value, false value)
3. =if(or (logic 1, logic 2,…), true value, false value)

E.g. 1. Discount in Bill

	A	B	C	D	E	F	G
1	the kathmandu mall						
2	sundhara, kathmandu						
3	sn	particular	quanity	rate	amount	discount	bill amount
4	1	mobile	10	15000	150000		
5	2	computer	5	35000	175000		
6	3	watch	15	500	7500		
7	4	radio	10	1000	10000		
8	5	tv	5	10000	50000		

Amount
=C4*D4 [i.e. quantity *rate]

Discount
=if (E4 >= 50000, E4*10%, 0)

Condition (amount should be greater than or equal to 50000)
True value (10% discount)
False value (no discount)

Bill Amount
=E4-F4 [i.e. amount - discount]

E.g. 2. "Voter" / "Non Voter"

	A	B	C	D
1	Kirtipur Municipality			
2	kathmandu, nepal			
3	sn	name	age	remarks
4	1	kamala	12	
5	2	bimala	18	
6	3	sarita	24	
7	4	mahesh	43	
8	5	kumar	10	

Remarks

=if (C4 >= 18, "Voter", "No voter")

Condition (age should be greate than or equal to 18)

True value (can give vote)

False value (can not give vote)

	A	B	C	D	E	F	G	H	I
1	child heaven english school								
2	kathmandu, nepal								
3	roll no	name	math	science	english	total	%	result	division
4	1	kumar	85	58	68				
5	2	hari	48	64	20				
6	3	shital	35	92	46				
7	4	shova	31	68	15				
8	5	sabita	75	69	38				
9	6	mahesh	92	46	96				
10	7	sanu	99	99	31				

Total

=C4+D4+E4 OR =SUM(C4:E4)

Percentage =F4/3

$$\frac{MarksObtained}{FullMarks}*100$$

$$=\frac{F4}{300}*100$$

$$=F4/3$$

Result

=if (and (C4 >= 32, D4 >= 32, E4 >= 32), "Pass", "Fail")

Logic 1 (marks of math) Logic 2 (marks of science) Logic 3 (marks of eng) True value (pass) False value (fail)

Division

=IF(AND(H4 = "Pass",G4>=80), "Dist",IF(AND(H4 = "Pass",G4 >= 60), "First", IF(AND(H4="Pass",G4>=45),"Sec",IF(AND (H4>="Pass",G4<45),"Third","Fail"))))

OR

=IF(H4="Fail", "Fail", IF(G4>=80, "Distinction", IF(G4>=60, "First", IF(G4>=45, "Second","Third"))))

NTC को बिल

	A	B	C	D	E	F	G	H	I	J
1	Nepal Telecommunication Corporation									
2	Telephone Bill									
3	Bill of Month:									
4	Tele No.	Name	Previous Reading	Current Reading	Total Calls	Excess Calls	Sub Total	Telecom Tax	VAT	Grand Total
5		ABC Computer	3120	3240						
6		Wlink								
7		Ktm. Trade								
8		Unique Studio								

Total Calls:

=D5-C5

Excess Calls:

=if(E5>=100,E5-100,0)

(Minimum Calls 100 मान्दा)

Sub Total:

=150+F5*1.5

(Minimum Charge 150 र सोभन्दा माथि प्रतिकलको 1.5 को दरले लिँदा)

Telecom Tax:

=G5*10%

VAT:

=(G5+H5)*10%

Grand Total:

=G5+H5+I5

Salary sheet

	A	B	C	D	E	F	G
1	ABC COMPANY						
2	sn	name	qulalification	post	salary	tax	net salary
3	1	sapana	slc				
4	2	kamana	master				
5	3	shovit	master				
6	4	sarala	bachelor				
7	5	kamal	slc				
8	6	jagannath	master				
9	7	sushil	inter				
10	8	kapil	slc				
11	9	mohan	5 class				

Post

=IF(OR(C3="master",C3="bachelor"),"Officer", IF(C3="Inter","Subba", IF(C3="slc","Kharidar"," Helper")))

Salary

=IF(D3="Officer",30500,IF(D3="Subba",23500,IF(D3 ="Kharidar",18500,15000)))

Tax

=IF(E3>=15000,E3*10%,E3*5%)

Net Salary

=E3-F3