Excel FUNCTION DICTIONARY

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Select An Option - Then click OK

- What the dictionary can be used for.
- How to use the dictionary.
- (•) View the Function List.
- Analysis ToolPak.
- Change the colour settings.

on slow computers.

OK

What Is In The Dictionary ?

This workbook contains 173 worksheets, each explaining the purpose and usage of particular Excel functions.

There are also a number of sample worksheets which are simple models of common applications, such as Timesheet and Date Calculations.

Formatting

Each worksheet uses the same type of formatting to indicate the various types of entry.

North
100
100
100
300

Text headings are shown in grey.

Data is shown as purple text on a yellow background.

The results of Formula are shown as blue on yellow.

=SUM(C13:C15) The formula used in the calulations is shown as blue text.

The Arial font is used exclusivley throughout the workbook and should display correctly with any installation of Windows.

Each sheet has been designed to be as simple as possible, with no fancy macros to accomplish the desrired result.

Printing

Each worksheet is set to print on to A4 portrait.
The printouts will have the column headings of A,B,C... and the row numbers 1,2,3... which will assist with the reading of the formula.
The ideal printer would be a laser set at 600dpi.
If you are using a dot matrix or inkjet, it may be worth switching off the colours before printing, as these will print as dark grey. (See the sheet dealing with Colour settings).

Protection

Each sheet is unprotected so that you will be able to change values and experiment with the calculations.

Macros

There are only a few very simple macros which are used by the various buttons to naviagte through the sheets. These have been written very simply, and do not make any attempt to change your current Toolbars and Menus.

What Do The Buttons Do ?

View

View

This button will display the worksheet containing the function example.

1. Click on the function name, then
2. Click on the **View** button.

Sort

Sort

This button sorts the list of functions into alphabetical order.

Category

Category

This describes the category the function is a member of.

Click this button to sort alphabetically.

Location

Location

This shows where the function is stored in Excel.

Built-in indicates that the function is part of Excel itself.

Analysis ToolPak indicates the function is stored in the Analysis ToolPak add-in.

Click this button to sort alphabetically.

Using Different Monitor Settings

Each sheet has been designed to fit within the visible width of monitors with a low resolution of 640 x 480. This ensures that you do not need to scroll from left and right to see all the data.

The colours are best suited to monitors capable of 256 colours.
On monitors using just 16 colours the greys may look a bit rough!
You can switch colours off and on using the button below.

☒ Colour On

This may take a few minutes on any computer !

Sample Colour Scheme

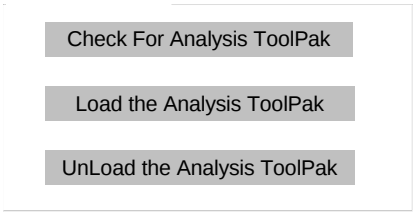
	North	South	East	West	Total
Alan	100	100	100	100	400
Bob	100	100	100	100	400
Carol	100	100	100	100	400
Total	300	300	300	300	1200

Analysis ToolPak

What Is The Analysis ToolPak ?

The Analysis ToolPak is an add-in file containing extra functions which are not built in to Excel. The functions cover areas such as Date and Mathematical operations.

The Analysis ToolPak must be added-in to Excel before these functions will be available.



Any formula using these functions without the ToolPak loaded will show the #NAME error.

Sort	View	Category	Location	
Y	- Project Dates	Sample	Sample	Example using date calculation.
Y	- Timesheet	Sample	Sample	
-	ABS	Mathematical	Built-in	Returns the absolute value of a number
-	AND	Logical	Built-in	Returns TRUE if all its arguments are TRUE
-	AVEDEV	Statistical	Built-in	Returns the average of the absolute deviations of data points from their mea
-	AVERAGE	Statistical	Built-in	Returns the average of its arguments
-	BIN2DEC	Engineering	Analysis ToolPak	Converts a binary number to decimal
-	CEILING	Mathematical	Built-in	Rounds a number to the nearest integer or to the nearest multiple of significance
-	CELL	Information	Built-in	Returns information about the formatting, location, or contents of a cell
-	CHAR	Text	Built-in	Returns the character specified by the code number
-	CHOOSE	Lookup	Built-in	Chooses a value from a list of values
-	CLEAN	Text	Built-in	Removes all nonprintable characters from text
-	CODE	Text	Built-in	Returns a numeric code for the first character in a text string
-	COLUMN	Lookup	Built-in	Returns the column number of a reference
-	COLUMNS	Lookup	Built-in	Returns the number of columns in a reference
-	COMBIN	Mathematical	Built-in	Returns the number of combinations for a given number of objects
-	CONCATENATE	Text	Built-in	Joins several text items into one text item
-	CONVERT	Engineering	Analysis ToolPak	Converts a number from one measurement system to another
-	CORREL	Statistical	Built-in	Returns the correlation coefficient between two data sets
-	COUNT	Statistical	Built-in	Counts how many numbers are in the list of arguments
-	COUNTA	Statistical	Built-in	Counts how many values are in the list of arguments
-	COUNTBLANK	Information	Built-in	Counts the number of blank cells within a range
-	COUNTIF	Mathematical	Built-in	Counts the number of nonblank cells within a range that meet the given crite a
-	CUMIPMT	Financial	Analysis ToolPak	Returns the cumulative interest paid between two periods
-	CUMPRINC	Financial	Analysis ToolPak	Returns the cumulative principal paid on a loan between two periods
-	DATE	Date	Built-in	Returns the serial number of a particular date
-	DATEVALUE	Date	Built-in	Converts a date in the form of text to a serial number
-	DAVERAGE	Database	Built-in	Returns the average of selected database entries
-	DAY	Date	Built-in	Converts a serial number to a day of the month
-	DAYS360	Date	Built-in	Calculates the number of days between two dates based on a 360-day year
-	DB	Financial	Built-in	Returns the depreciation of an asset for a specified period using the fixed-declining balance method
-	DCOUNT	Database	Built-in	Counts the cells that contain numbers in a database
-	DCOUNTA	Database	Built-in	Counts nonblank cells in a database
-	DDB	Financial	Built-in	Returns depreciation of an asset for a specified period using the double-declining balance method or some other you specify
-	DEC2BIN	Engineering	Analysis ToolPak	Converts a decimal number to binary
-	DEC2HEX	Engineering	Analysis ToolPak	Converts a decimal number to hexadecimal
-	DELTA	Engineering	Analysis ToolPak	Tests whether two values are equal
-	DGET	Database	Built-in	Extracts from a database a single record that matches the specified criteria
-	DMAX	Database	Built-in	Returns the maximum value from selected database entries
-	DMIN	Database	Built-in	Returns the minimum value from selected database entries
-	DOLLAR	Text	Built-in	Converts a number to text, using currency format
-	DPRODUCT	Database	Built-in	Multiplies the values in a particular field of records that match the criteria in a database
-	DSTDEV	Database	Built-in	Estimates the standard deviation based on a sample of selected database entries
-	DSTDEVP	Database	Built-in	Calculates the standard deviation based on the entire population of selected database entries
-	DSUM	Database	Built-in	Adds the numbers in the field column of records in the database that match the criteria
-	DVAR	Database	Built-in	Estimates variance based on a sample from selected database entries
-	DVARP	Database	Built-in	Calculates variance based on the entire population of selected database entries
-	EDATE	Date	Analysis ToolPak	Returns the serial number of the date that is the indicated number of months before or after the start date
-	EFFECT	Financial	Analysis ToolPak	Returns the effective annual interest rate
-	EOMONTH	Date	Analysis ToolPak	Returns the serial number of the last day of the month before or after a specified number of months
-	ERROR.TYPE	Information	Built-in	Returns a number corresponding to an error type
-	EVEN	Mathematical	Built-in	Rounds a number up to the nearest even integer
-	EXACT	Text	Built-in	Checks to see if two text values are identical
-	FACT	Mathematical	Built-in	Returns the factorial of a number
-	FALSE	Logical	Built-in	Returns the logical value FALSE
-	FIND	Text	Built-in	Finds one text value within another (case-sensitive)
-	FIXED	Text	Built-in	Formats a number as text with a fixed number of decimals
-	FLOOR	Mathematical	Built-in	Rounds a number down, toward zero
-	FORECAST	Statistical	Built-in	Returns a value along a linear trend
-	FREQUENCY	Statistical	Built-in	Returns a frequency distribution as a vertical array
-	FV	Financial	Built-in	Returns the future value of an investment
-	GCD	Mathematical	Analysis ToolPak	Returns the greatest common divisor
-	GESTEP	Engineering	Analysis ToolPak	Tests whether a number is greater than a threshold value
-	GROWTH	Statistical	Built-in	Returns values along an exponential trend
-	HEX2DEC	Engineering	Analysis ToolPak	Converts a hexadecimal number to decimal
-	HLOOKUP	Lookup	Built-in	Looks in the top row of an array and returns the value of the indicated cell
-	HOUR	Date	Built-in	Converts a serial number to an hour
-	HYPERLINK	Lookup	Built-in	Creates a shortcut or jump that opens a document stored on a network serve , an intranet, or the Internet
-	IF	Logical	Built-in	Specifies a logical test to perform
-	INDEX	Lookup	Built-in	Uses an index to choose a value from a reference or array
-	INDIRECT	Lookup	Built-in	Returns a reference indicated by a text value
-	INFO	Information	Built-in	Returns information about the current operating environment
-	INT	Mathematical	Built-in	Rounds a number down to the nearest integer
-	ISBLANK	Information	Built-in	Returns TRUE if the value is blank
-	ISERR	Information	Built-in	Returns TRUE if the value is any error value except #N/A
-	ISERROR	Information	Built-in	Returns TRUE if the value is any error value
-	ISEVEN	Information	Analysis ToolPak	Returns TRUE if the number is even
-	ISLOGICAL	Information	Built-in	Returns TRUE if the value is a logical value
-	ISNA	Information	Built-in	Returns TRUE if the value is the #N/A error value
-	ISNONTEXT	Information	Built-in	Returns TRUE if the value is not text
-	ISNUMBER	Information	Built-in	Returns TRUE if the value is a number
-	ISODD	Information	Analysis ToolPak	Returns TRUE if the number is odd
-	ISREF	Information	Built-in	Returns TRUE if the value is a reference
-	ISTEXT	Information	Built-in	Returns TRUE if the value is text
-	LARGE	Statistical	Built-in	Returns the k-th largest value in a data set
-	LCM	Mathematical	Analysis ToolPak	Returns the least common multiple
-	LEFT	Text	Built-in	Returns the leftmost characters from a text value
-	LEN	Text	Built-in	Returns the number of characters in a text string
-	LINEST	Statistical	Built-in	Returns the parameters of a linear trend
-	LOGEST	Statistical	Built-in	Returns the parameters of an exponential trend
Y	LOOKUP (vector)	Lookup	Built-in	Looks up values in a vector or array
-	LOWER	Text	Built-in	Converts text to lowercase
-	MATCH	Lookup	Built-in	Looks up values in a reference or array
-	MAX	Statistical	Built-in	Returns the maximum value in a list of arguments
-	MDETERM	Mathematical	Built-in	Returns the matrix determinant of an array
-	MEDIAN	Statistical	Built-in	Returns the median of the given numbers
-	MID	Text	Built-in	Returns a specific number of characters from a text string starting at the posi on you specify
-	MIN	Statistical	Built-in	Returns the minimum value in a list of arguments
-	MINUTE	Date	Built-in	Converts a serial number to a minute
-	MINVERSE	Mathematical	Built-in	Returns the matrix inverse of an array
-	MMULT	Mathematical	Built-in	Returns the matrix product of two arrays
-	MOD	Mathematical	Built-in	Returns the remainder from division
-	MODE	Statistical	Built-in	Returns the most common value in a data set
-	MONTH	Date	Built-in	Converts a serial number to a month
-	MROUND	Mathematical	Analysis ToolPak	Returns a number rounded to the desired multiple
-	N	Information	Built-in	Returns a value converted to a number
-	NA	Information	Built-in	Returns the error value #N/A
-	NETWORKDAYS	Date	Analysis ToolPak	Returns the number of whole workdays between two dates
-	NOT	Logical	Built-in	Reverses the logic of its argument
-	NOW	Date	Built-in	Returns the serial number of the current date and time
-	NPV	Financial	Built-in	Returns the net present value of an investment based on a series of periodic cash flows and a discount rate
-	ODD	Mathematical	Built-in	Rounds a number up to the nearest odd integer
-	OFFSET	Lookup	Built-in	Returns a reference offset from a given reference
-	OR	Logical	Built-in	Returns TRUE if any argument is TRUE

Sort	View	Category	Location	
-	PERCENTILE	Statistical	Built-in	Returns the k-th percentile of values in a range
-	PERCENTRANK	Statistical	Built-in	Returns the percentage rank of a value in a data set
-	PERMUT	Statistical	Built-in	Returns the number of permutations for a given number of objects
-	PI	Mathematical	Built-in	Returns the value of Pi
-	POWER	Mathematical	Built-in	Returns the result of a number raised to a power
-	PRODUCT	Mathematical	Built-in	Multiplies its arguments
-	PROPER	Text	Built-in	Capitalises the first letter in each word of a text value
-	PV	Financial	Built-in	Returns the present value of an investment
-	QUARTILE	Statistical	Built-in	Returns the quartile of a data set
-	QUOTIENT	Mathematical	Analysis ToolPak	Returns the integer portion of a division
-	RAND	Mathematical	Built-in	Returns a random number between 0 and 1
-	RANDBETWEEN	Mathematical	Analysis ToolPak	Returns a random number between the numbers you specify
-	RANK	Statistical	Built-in	Returns the rank of a number in a list of numbers
-	REPLACE	Text	Built-in	Replaces characters within text
-	REPT	Text	Built-in	Repeats text a given number of times
-	RIGHT	Text	Built-in	Returns the rightmost characters from a text value
-	ROMAN	Mathematical	Built-in	Converts an arabic numeral to roman, as text
-	ROUND	Mathematical	Built-in	Rounds a number to a specified number of digits
-	ROUNDDOWN	Mathematical	Built-in	Rounds a number down, toward zero
-	ROUNDUP	Mathematical	Built-in	Rounds a number up, away from zero
-	ROW	Lookup	Built-in	Returns the row number of a reference
-	ROWS	Lookup	Built-in	Returns the number of rows in a reference
-	SEARCH	Text	Built-in	Finds one text value within another (not case-sensitive)
-	SECOND	Date	Built-in	Converts a serial number to a second
-	SIGN	Mathematical	Built-in	Returns the sign of a number
-	SLN	Financial	Built-in	Returns the straight-line depreciation of an asset for one period
-	SMALL	Statistical	Built-in	Returns the k-th smallest value in a data set
-	STDEV	Statistical	Built-in	Estimates standard deviation based on a sample
-	STDEVA	Statistical	Built-in	Estimates standard deviation based on a sample, including numbers, text, and logical values
-	STDEVP	Statistical	Built-in	Calculates standard deviation based on the entire population
-	STDEVPA	Statistical	Built-in	Calculates standard deviation based on the entire population, including numbers, text, and logical values
-	SUBSTITUTE	Text	Built-in	Substitutes new text for old text in a text string
-	SUBTOTAL	Mathematical	Built-in	Returns a subtotal in a list or database
-	SUM	Mathematical	Built-in	Adds its arguments
-	SUM with OFFSET	Lookup		
-	SUMIF	Mathematical	Built-in	Adds the cells specified by a given criteria
-	SUMPRODUCT	Mathematical	Built-in	Returns the sum of the products of corresponding array components
-	SYD	Financial	Built-in	Returns the sum-of-years' digits depreciation of an asset for a specified period
-	T	Text	Built-in	Converts its arguments to text
-	TEXT	Text	Built-in	Formats a number and converts it to text
-	TIME	Date	Built-in	Returns the serial number of a particular time
-	TIMEVALUE	Date	Built-in	Converts a time in the form of text to a serial number
-	TODAY	Date	Built-in	Returns the serial number of today's date
-	TRANSPOSE	Lookup	Built-in	Returns the transpose of an array
-	TREND	Statistical	Built-in	Returns values along a linear trend
-	TRIM	Text	Built-in	Removes spaces from text
-	TRUE	Logical	Built-in	Returns the logical value TRUE
-	TRUNC	Mathematical	Built-in	Truncates a number to an integer
-	TYPE	Information	Built-in	Returns a number indicating the data type of a value
-	UPPER	Text	Built-in	Converts text to uppercase
-	VALUE	Text	Built-in	Converts a text argument to a number
-	VAR	Statistical	Built-in	Estimates variance based on a sample
-	VARP	Statistical	Built-in	Calculates variance based on the entire population
-	VDB	Financial	Built-in	Returns the depreciation of an asset for a specified or partial period using a declining balance method
-	VLOOKUP	Lookup	Built-in	Looks in the first column of an array and moves across the row to return the value of a cell
-	WEEKDAY	Date	Built-in	Converts a serial number to a day of the week
-	WORKDAY	Date	Analysis ToolPak	Returns the serial number of the date before or after a specified number of workdays
-	YEAR	Date	Built-in	Converts a serial number to a year
-	YEARFRAC	Date	Analysis ToolPak	Returns the year fraction representing the number of whole days between start_date and end_date

Notes.
Column A:
I used this to keep track of the my progress. A letter Y indicates that its been finished. This column would have been removed if I had ever completed the project.

Usage:
1. Click a function name in column B.
2. Then click on the **View** button at the top.

Protection:
Some of sheets may be protected, but there is no password. You may find that the macros re-protect the sheets at some stage.
If there are any passwords, try 'rainbow', I use that as a working password during project development.

Analysis ToolPak
Remember that these functions will not work unless the toolpak is loaded. See the Analysis Toolpak sheet for more details.
(Does anyone know how to change the colour of the tab for the sheet names?)

End

AVERAGEA

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp C	30	31	32	29	26	28	27	#MACRO?	=AVERAGE(D4:J4)
Rain cm	0	0	0	4	6	3	1	2	=AVERAGE(D5:J5)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp C	30		32	29	26	28	27	28.67	=AVERAGE(D8:J8)
Rain cm	0		0	4	6	3	1	2.33	=AVERAGE(D9:J9)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp C	30	No	32	29	26	28	27	28.67	=AVERAGE(D12:J12)
Rain cm	0	Reading	0	4	6	3	1	2.33	=AVERAGE(D13:J13)

What Does It Do ?

This function calculates the average from a list of numbers.
If the cell is blank or contains text, the cell will not be used in the average calculation.
If the cell contains zero 0, the cell will be included in the average calculation.

Syntax

=AVERAGE(Range1,Range2,Range3... through to Range30)

Formatting

No special formatting is needed.

	A	B	C	D	E	F	G	H	I	J
1	MAXA									
2										

ABS

Number	Absolute Value	
10	10	=ABS(C4)
-10	10	=ABS(C5)
1.25	1.25	=ABS(C6)
-1.25	1.25	=ABS(C7)

What Does it Do ?

This function calculates the value of a number, irrespective of whether it is positive or negative.

Syntax

=ABS(CellAddress or Number)

Formatting

The result will be shown as a number, no special formatting is needed.

Example

The following table was used by a company testing a machine which cuts timber.
The machine needs to cut timber to an exact length.
Three pieces of timber were cut and then measured.
In calculating the difference between the Required Length and the Actual Length it does not matter if the wood was cut too long or short, the measurement needs to be expressed as an absolute value.

Table 1 shows the original calculations.
The Difference for Test 3 is shown as negative, which has a knock on effect when the Error Percentage is calculated.
Whether the wood was too long or short, the percentage should still be expressed as an absolute value.

Table 1

Test Cut	Required Length	Actual Length	Difference	Error Percentage
Test 1	120	120	0	0%
Test 2	120	90	30	25%
Test 3	120	150	-30	-25%

=D36-E36

Table 2 shows the same data but using the =ABS() function to correct the calculations.

Table 2

Test Cut	Required Length	Actual Length	Difference	Error Percentage
Test 1	120	120	0	0%
Test 2	120	90	30	25%
Test 3	120	150	30	25%

=ABS(D45-E45)

ADDRESS

Type a column number :	2
Type a row number :	3
Type a sheet name :	Hello

B3	=ADDRESS(F4,F3,1,TRUE)
B$3	=ADDRESS(F4,F3,2,TRUE)
$B3	=ADDRESS(F4,F3,3,TRUE)
B3	=ADDRESS(F4,F3,4,TRUE)

R3C2	=ADDRESS(F4,F3,1,FALSE)
R3C[2]	=ADDRESS(F4,F3,2,FALSE)
R[3]C2	=ADDRESS(F4,F3,3,FALSE)
R[3]C[2]	=ADDRESS(F4,F3,4,FALSE)

Hello.B3	=ADDRESS(F4,F3,1,TRUE,F5)
Hello.B$3	=ADDRESS(F4,F3,2,TRUE,F5)
Hello.$B3	=ADDRESS(F4,F3,3,TRUE,F5)
Hello.B3	=ADDRESS(F4,F3,4,TRUE,F5)

What Does It Do ?

This function creates a cell reference as a piece of text, based on a row and column numbers given by the user.
This type of function is used in macros rather than on the actual worksheet.

Syntax

=ADDRESS(RowNumber,ColNumber,Absolute,A1orR1C1,SheetName)
The RowNumber is the normal row number from 1 to 16384.
The ColNumber is from 1 to 256, cols A to IV.

The Absolute can be 1,2,3 or 4.
When 1 the reference will be in the form A1, column and row absolute.
When 2 the reference will be in the form A$1, only the row absolute.
When 3 the reference will be in the form $A1, only the column absolute.
When 4 the reference will be in the form A1, neither col or row absolute.

The A1orR1C1 is either TRUE of FALSE.
When TRUE the reference will be in the form A1, the normal style for cell addresses.
When FALSE the reference will be in the form R1C1, the alternative style of cell address.

The SheetName is a piece of text to be used as the worksheet name in the reference.
The SheetName does not actually have to exist.

AND

Items To Test		Result	
500	800	TRUE	=AND(C4>=100,D4>=100)
500	25	FALSE	=AND(C5>=100,D5>=100)
25	500	FALSE	=AND(C6>=100,D6>=100)
	12	TRUE	=AND(D7>=1,D7<=52)

What Does It Do?

This function tests two or more conditions to see if they are all true.
It can be used to test that a series of numbers meet certain conditions.
It can be used to test that a number or a date falls between an upper and lower limit.
Normally the AND() function would be used in conjunction with a function such as =IF().

Syntax

=AND(Test1,Test2)
Note that there can be up to 30 possible tests.

Formatting

When used by itself it will show TRUE or FALSE.

Example 1

The following example shows a list of examination results.
The teacher wants to find the pupils who scored above average in all three exams.
The =AND() function has been used to test that each score is above the average.
The result of TRUE is shown for pupils who have scored above average in all three exams.

Name	Maths	English	Physics	Passed
Alan	80	75	85	TRUE
Bob	50	30	40	FALSE
Carol	60	70	50	FALSE
David	90	85	95	TRUE
Eric	20	30	Absent	FALSE
Fred	40	60	80	FALSE
Gail	10	90	80	FALSE
Harry	80	70	60	TRUE
Ian	30	10	20	FALSE
Janice	10	20	30	FALSE

=AND(C38>=AVERAGE(C29:C38),D38>=AVERAGE(D29:D38),E38>=AVERAGE(E29:E38))

Averages	47	54	60

AREAS

Pink

Name	Age
Alan	18
Bob	17
Carol	20

Green

Name	Age
David	20
Eric	16
Fred	19

Err:504 =AREAS(PeopleLists)

What Does It Do?

This function tests a range to determine whether it is a single block of data, or whether it is a multiple selection.
If it is a single block the result will be 1.
If it is a multiple block the result will be the number of ranges selected.
The function is designed to be used in macros.

Syntax

=AREAS(RangeToTest)

Formatting

The result will be shown as a number.

Example

The example at the top of this page shows two ranges coloured pink and green.
These ranges have been given the name PeopleLists.
The =AREAS(PeopleLists) gives a result of 2 indicating that there are two separate selections which form the PeopleLists range.

Note

To name multiple ranges the CTRL key must be used.
In the above example the pink range was selected as normal, then the Ctrl key was held down before selecting the green range.
When a Range Name is created it will consider both Pink and Green as being one range.

AVERAGE

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp	30	31	32	29	26	28	27	29	=AVERAGE(D4:J4)
Rain	0	0	0	4	6	3	1	2	=AVERAGE(D5:J5)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp	30		32	29	26	28	27	28.67	=AVERAGE(D8:J8)
Rain	0		0	4	6	3	1	2.33	=AVERAGE(D9:J9)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp	30	No	32	29	26	28	27	28.67	=AVERAGE(D12:J12)
Rain	0	Reading	0	4	6	3	1	2.33	=AVERAGE(D13:J13)

What Does It Do ?

This function calculates the average from a list of numbers.
If the cell is blank or contains text, the cell will not be used in the average calculation.
If the cell contains zero 0, the cell will be included in the average calculation.

Syntax

=AVERAGE(Range1,Range2,Range3... through to Range30)

Formatting

No special formatting is needed.

Note

To calculate the average of cells which contain text or blanks use =SUM() to get the total and then divide by the count of the entries using =COUNTA().

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp	30	No	32	29	26	28	27	24.57	=SUM(D31:J31)/COUNTA(D31:J31)
Rain	0	Reading	0	4	6	3	1	2	=SUM(D32:J32)/COUNTA(D32:J32)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average	
Temp	30		32	29	26	28	27	28.67	=SUM(D35:J35)/COUNTA(D35:J35)
Rain	0		0	4	6	3	1	2.33	=SUM(D36:J36)/COUNTA(D36:J36)

Further Usage

BIN2DEC

Binary Number	Decimal Equivalent	
0	0	=BIN2DEC(C4)
1	1	=BIN2DEC(C5)
10	2	=BIN2DEC(C6)
11	3	=BIN2DEC(C7)
111111111	511	=BIN2DEC(C8)
1111111111	-1	=BIN2DEC(C9)
1111111110	-2	=BIN2DEC(C10)
1111111101	-3	=BIN2DEC(C11)
1000000000	-512	=BIN2DEC(C12)
11111111111	Err:502	=BIN2DEC(C13)

What Does It Do ?

This function converts a binary number to decimal.
Negative numbers are represented using two's-complement notation.

Syntax

=BIN2DEC(BinaryNumber)
The binary number has a limit of ten characters.

Formatting

No special formatting is needed.

CEILING

Number	Raised Up	
2.1	3	=CEILING(C4,1)
1.5	2	=CEILING(C5,1)
1.9	2	=CEILING(C6,1)
20	30	=CEILING(C7,30)
25	30	=CEILING(C8,30)
40	60	=CEILING(C9,30)

What Does It Do ?

This function rounds a number up to the nearest multiple specified by the user.

Syntax

=CEILING(ValueToRound,MultipleToRoundUpTo)
The ValueToRound can be a cell address or a calculation.

Formatting

No special formatting is needed.

Example 1

The following table was used by a estate agent renting holiday apartments.
The properties being rented are only available on a weekly basis.
When the customer supplies the number of days required in the property the =CEILING() function rounds it up by a multiple of 7 to calculate the number of full weeks to be billed.

	Days Required	Days To Be Billed	
Customer 1	3	7	=CEILING(D28,7)
Customer 2	4	7	=CEILING(D29,7)
Customer 3	10	14	=CEILING(D30,7)

Example 2

The following table was used by a builders merchant delivering products to a construction site.
The merchant needs to hire trucks to move each product.
Each product needs a particular type of truck of a fixed capacity.

Table 1 calculates the number of trucks required by dividing the Units To Be Moved by the Capacity of the truck.
This results of the division are not whole numbers, and the builder cannot hire just part of a truck.

Table 1

Item	Units To Be Moved	Truck Capacity	Trucks Needed	
Bricks	1000	300	3.33	=D45/E45
Wood	5000	600	8.33	=D46/E46
Cement	2000	350	5.71	=D47/E47

Table 2 shows how the =CEILING() function has been used to round up the result of the division to a whole number, and thus given the exact amount of trucks needed.

Table 2

Item	Units To Be Moved	Truck Capacity	Trucks Needed	
Bricks	1000	300	4	=CEILING(D54/E54,1)

	C	D	E	F	G
Wood	5000	600	9	=CEILING(D55/E55,1)
Cement	2000	350	6	=CEILING(D56/E56,1)

Example 3

The following tables were used by a shopkeeper to calculate the selling price of an item.
The shopkeeper buys products by the box.
The cost of the item is calculated by dividing the Box Cost by the Box Quantity.
The shopkeeper always wants the price to end in 99 pence.

Table 1 shows how just a normal division results in varying Item Costs.

Table 1

Item	Box Qnty	Box Cost	Cost Per Item	
Plugs	11	£20	1.81818	=D69/C69
Sockets	7	£18.25	2.60714	=D70/C70
Junctions	5	£28.10	5.62000	=D71/C71
Adapters	16	£28	1.75000	=D72/C72

Table 2 shows how the =CEILING() function has been used to raise the Item Cost to always end in 99 pence.

Table 2

Item	In Box	Box Cost	Cost Per Item	Raised Cost
Plugs	11	£20	1.81818	1.99
Sockets	7	£18.25	2.60714	2.99
Junctions	5	£28.10	5.62000	5.99
Adapters	16	£28	1.75000	1.99

=INT(E83)+CEILING(MOD(E83,1),0.99)

Explanation

=INT(E83)	Calculates the integer part of the price.
=MOD(E83,1)	Calculates the decimal part of the price.
=CEILING(MOD(E83),0.99)	Raises the decimal to 0.99

CELL

This is the cell and contents to test.	17.50%

The cell address.	D3	=CELL("address",D3)
The column number.	4	=CELL("col",D3)
The row number.	3	=CELL("row",D3)
The actual contents of the cell.	0.18	=CELL("contents",D3)
The type of entry in the cell. Shown as **b** for blank, **l** for text, **v** for value.	v	=CELL("type",D3)
The alignment of the cell. Shown as **'** for left, **^** for centre, **"** for right. Nothing is shown for numeric entries.		=CELL("prefix",D3)
The width of the cell.	12	=CELL("width",D3)
The number format fo the cell. (See the table shown below)	P2	=CELL("format",D3)
Formatted for braces ( ) on positive values. **1** for yes, **0** for no.	0	=CELL("parentheses",D3)
Formatted for coloured negatives. **1** for yes, **0** for no.	0	=CELL("color",D3)
The type of cell protection. **1** for a locked, **0** for unlocked.	1	=CELL("protect",D3)
The filename containing the cell.	'file:///storage/tailieu/files/source/20101110/vanthang122141/173_funtions_of_excel_1538.xls'#$CELL	=CELL("filename",D3)

What Does It Do ?

This function examines a cell and displays information about the contents, position and formatting.

Syntax

=CELL("TypeOfInfoRequired",CellToTest)

The TypeOfInfoRequired is a text entry which must be surrounded with quotes " ".

Formatting

No special formatting is needed.

Codes used to show the formatting of the cell.

Numeric Format	Code
General	G
0	F0
#,##0	,0
0.00	F2
#,##0.00	,2
$#,##0_);($#,##0)	C0
$#,##0_);[Red]($#,##0)	C0-
$#,##0.00_);($#,##0.00)	C2
$#,##0.00_);[Red]($#,##0.00)	C2-
0%	P0
0.00%	P2
0.00E+00	S2
# ?/? or # ??/??	G
m/d/yy or m/d/yy h:mm or mm/dd/yy.	D4
d-mmm-yy or dd-mmm-yy	D1
d-mmm or dd-mmm	D2
mmm-yy	D3
mm/dd	D5
h:mm AM/PM	D7
h:mm:ss AM/PM	D6
h:mm	D9
h:mm:ss	D8

Example

The following example uses the =CELL() function as part of a formula which extracts the filename.

The name of the current file is :	#VALUE!

=MID(CELL("filename"),FIND("[",CELL("filename"))+1,FIND("]",CELL("filename"))-FIND("[",CELL("filename"))-1)

CHAR

ANSI Number	Character	
65	A	=CHAR(G4)
66	B	=CHAR(G5)
169	©	=CHAR(G6)

What Does It Do?

This function converts a normal number to the character it represent in the ANSI character set used by Windows.

Syntax

=CHAR(Number)

The Number must be between 1 and 255.

Formatting

The result will be a character with no special formatting.

Example

The following is a list of all 255 numbers and the characters they represent.
Note that most Windows based program may not display some of the special characters, these will be displayed as a small box.

1		26		51	3	76	L	101	e	126	~	151	1	176	°	201	É	226	â	251	û
2		27		52	4	77	M	102	f	127	1	152	1	177	±	202	Ê	227	ã	252	ü
3		28		53	5	78	N	103	g	128	1	153	1	178	²	203	Ë	228	ä	253	ý
4		29		54	6	79	O	104	h	129	1	154	1	179	³	204	Ì	229	å	254	þ
5		30		55	7	80	P	105	i	130	1	155	1	180	´	205	Í	230	æ	255	ÿ
6		31		56	8	81	Q	106	j	131	1	156	1	181	µ	206	Î	231	ç		
7		32		57	9	82	R	107	k	132	1	157	1	182	¶	207	Ï	232	è		
8		33	!	58	:	83	S	108	l	133	1	158	1	183	·	208	Ð	233	é		
9		34	"	59	;	84	T	109	m	134	1	159	1	184	¸	209	Ñ	234	ê		
10		35	#	60	<	85	U	110	n	135	1	160		185	¹	210	Ò	235	ë		
11		36	$	61	=	86	V	111	o	136	1	161	¡	186	º	211	Ó	236	ì		
12		37	%	62	>	87	W	112	p	137	1	162	¢	187	»	212	Ô	237	í		
13		38	&	63	?	88	X	113	q	138	1	163	£	188	¼	213	Õ	238	î		
14		39	'	64	@	89	Y	114	r	139	1	164	¤	189	½	214	Ö	239	ï		
15		40	(	65	A	90	Z	115	s	140	1	165	¥	190	¾	215	×	240	ð		
16		41	)	66	B	91	[	116	t	141	1	166	¦	191	¿	216	Ø	241	ñ		
17		42	*	67	C	92	\	117	u	142	1	167	§	192	À	217	Ù	242	ò		
18		43	+	68	D	93	]	118	v	143	1	168	¨	193	Á	218	Ú	243	ó		
19		44	,	69	E	94	^	119	w	144	1	169	©	194	Â	219	Û	244	ô		
20		45	-	70	F	95	_	120	x	145	1	170	ª	195	Ã	220	Ü	245	õ		
21		46	.	71	G	96	`	121	y	146	1	171	«	196	Ä	221	Ý	246	ö		
22		47	/	72	H	97	a	122	z	147	1	172	¬	197	Å	222	Þ	247	÷		
23		48	0	73	I	98	b	123	{	148	1	173	-	198	Æ	223	ß	248	ø		
24		49	1	74	J	99	c	124	|	149	1	174	®	199	Ç	224	à	249	ù		
25		50	2	75	K	100	d	125	}	150	1	175	¯	200	È	225	á	250	ú		

Note

Number 32 does not show as it is the SPACEBAR character.