Excel Formula 1

The *fastest* way to learn excel formulas

by

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http://chandoo.org/wp/

How to read this book?

This book explains 75 very commonly used Microsoft excel formulas in plain English. The best way to read this book is to read few formulas at a time and then practice them on using excel.

Each formula is explained with description, syntax and 2 examples. I suggest you to give these formulas a try by typing them in excel.

For more information on excel formulas, do visit the following links:

http://chandoo.org/wp/tag/formulas
http://chandoo.org/excel-formulas
http://chandoo.org/wp/category/excel

All the best

List of Formulas Covered in This Book

Math Formulas		Logical	Text	Lookup	Statistical	Date & Time	Financial
Sum	Rand	If	Concatenate	Vlookup	Min	Today	Npv
Count	Randbetween	And	Left	Hlookup	Max	Now	Fv
Average	Subtotal	Or	Mid	Match	Small	Year	Pmt
Countif	Sign	Not	Lower	Index	Large	Month	Ipmt
Sumif	Product	Choose	Upper	Row	Mode	Day	Ppmt
Averageif	Abs	Iserror	Proper	Column	Median	Weekday	
Countblank	Floor	Isblank	Len		Rank	Hour	
Round	Ceiling	Isnumber	Find		Percentile	Minute	
Int	Roman	Istext	Trim			Second	
Mod		Iferror	Dollar			Datevalue	
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Mathematical Formulas

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Sum

What it does?

Adds a bunch of numbers

Syntax

sum(add this, [and this ..])

Example

sum(1,2,3,4) = 10

sum(5.6,2.3) = 7.9

Learn more here: http://chandoo.org/wp/?s=Sum+formula

Count

What it does?

Counts the number of cells in a range (only numbers will be counted)

Syntax

count(range of cells)

Example

count(1,2,3,4,5,6,"hello",7,8) = 8 (ignores the text value hello)

Note: if you want to count only blank cells, use countblank() instead

Learn more here: http://chandoo.org/wp/?s=Count+formula

Average

What it does?

Average of given numbers

Syntax

average(of this number, [and this number too..])

Example

average(2,4,6) = 4

average(A1:A5) = average of numbers in A1:A5

Learn more here: http://chandoo.org/wp/?s=Average+formula

Countif

What it does?

Counts of items in a list matching a condition

Syntax

countif(in this range, values meeting this criteria)

Example

countif(A1:A20, 1) = counts how many cells have "1"

countif(A1:A20, "<3") = counts how many cells have less than 3

Learn more here: http://chandoo.org/wp/?s=Countif+formula

Sumif

What it does?

Sums items in a list matching a condition

Syntax

sumif(in this range, values meeting this criteria, [sum-this-range])

Example

sumif(A1:A20, 3) = sums the cells with a value of "3"

sumif(A1:A20, 3, b1:b20) = same as above but adds values in B1:B20

Learn more here: http://chandoo.org/wp/?s=Sumif+formula

Averageif

Excel 2007 only

What it does?

Gets the average of values in a list that match a condition

Syntax

averageif(in this range, values meeting this criteria, [use this range for average])

Example

averageif(A1:A20, ">5") = average of all the values above 5 in A1:A20

averageif(A1:A20, "Bob", B1:B20) = Average of all values in B1:B20 where the corresponding row in A has "Bob"

Learn more here: http://chandoo.org/wp/?s=Averageif+formula

Countblank

What it does?

Counts blank cells in a given list

Syntax

countblank(in this list)

Example

countblank(list) = number of blank cells in the list

Learn more here: http://chandoo.org/wp/?s=Countblank+formula

Round

What it does?

Rounds a number to nearest decimal you specify

Syntax

round(this number, to this many digits after decimal)

Example

round(1.2365,0) = 1

round(1.2365,2) = 1.24

Learn more here: http://chandoo.org/wp/?s=Round+formula

Int

What it does?

Converts a decimal number to integer lower than it

Syntax

int(this number)

Example

int(1.2365) = 1

Learn more here: http://chandoo.org/wp/?s=Int+formula

Mod

What it does?

Tells you what is the reminder after dividing one number with another

Syntax

mod(of this number, divided by this number)

Example

mod(5,3) = 2

mod(3,5) = 3

Learn more here: http://chandoo.org/wp/?s=Mod+formula

Rand

What it does?

Gives you a random number to play with

Syntax

rand()

Example

rand() = who knows

Learn more here: http://chandoo.org/wp/?s=Rand+formula

Randbetween

What it does?

Gets you a random integer between 2 given numbers (including both)

Syntax

randbetween(lower limit, higher limit)

Example

randbetween(0,100) = returns a random number between 0 and 100

Note: if you are using excel 2003 or earlier, you need to enable this function by adding analysis toolpak add-in.

Learn more here: http://chandoo.org/wp/?s=Randbetween+formula

Subtotal

What it does?

tells you the sum, average, count, standard deviation etc. of a list of numbers. If you apply data filters, the subtotal value changes based on the filtered values.

Syntax

subtotal(<function number>,list-of-values)

Example

subtotal(1,scores_list) = average of the scores_list

Note: function number 1 - Average, 2 - Count, 3 - Counta, 4 - Max, 5 - Min, 6 - Product, 7 - Standard Deviation, 8 - STDEVP, 9 - Sum

Learn more here: http://chandoo.org/wp/?s=Subtotal+formula

Sign

What it does?

tells you the sign of a number, 1 for positive, 0 for zero and -1 for negative values

Syntax

sign(of this number)

Example

sign(15) = 1

sign(0) = 0, sign(-15) = -1

Learn more here: http://chandoo.org/wp/?s=Sign+formula

Product

What it does?

multiplies a bunch of numbers

Syntax

product(list of numbers)

Example

product(1,2,3,4,5) = 120

product(400,40%,50%) = 80 (50% of 40% of 400)

Learn more here: http://chandoo.org/wp/?s=Product+formula

Abs

What it does?

tells you the absolute value of a given number

Syntax

abs(some number)

Example

abs(-5) = 5

abs(1) = 1, abs(0) = 0

Learn more here: http://chandoo.org/wp/?s=Abs+formula

Floor

What it does?

Rounds a number down, towards zero

Syntax

floor(this number, to the nearest multiple of this number)

Example

floor(3.678,1) = 1 (since 3 is the nearest multiple of 1)

floor(89,2) = 88, floor(-89,-2) = -88

Learn more here: http://chandoo.org/wp/?s=Floor+formula

Ceiling

What it does?

Rounds a number up, away from zero

Syntax

ceiling(this number, to the nearest multiple of this number)

Example

ceiling(3.678,1) = 4 (since 4 is the nearest multiple of 1 away from zero)

ceiling(89,2) = 90, ceiling(-89,-2) = -90

Learn more here: http://chandoo.org/wp/?s=Ceiling+formula

Roman

What it does?

converts a number to roman number format

Syntax

roman(number)

Example

roman(4) = IV

roman(2009) = MMIX, roman(1999,4) = MIM

Learn more here: http://chandoo.org/wp/?s=Roman+formula

Logical Formulas

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IF

What it does?

Fetches one of the two values based on a condition

Syntax

if(is-this-true?, do this, or this)

Example

if(5<10,"hello","world") = hello

if(5>10,"hello","world") = world

Learn more here: http://chandoo.org/wp/?s=If+formula

And

What it does?

Checks whether all conditions are passed or not

Syntax

and(list of conditions)

Example

and(true, false) = false

and(true, true) = true

Learn more here: http://chandoo.org/wp/?s=And+formula

Or

What it does?

Checks whether any condition is met

Syntax

or(list of conditions)

Example

or(true, false) = true

or(false, false) = false

Learn more here: http://chandoo.org/wp/?s=Or+formula

Not

What it does?

Negates a logical value

Syntax

not(this logical value)

Example

not(false) = true

not(not(false)) = false

Learn more here: http://chandoo.org/wp/?s=Not+formula

Choose

What it does?

selects one of the parameters based on first parameter. Works like a really big nested IF()

Syntax

choose(this value, from this list of values…)

Example

choose(3,"value 1", "value2", "another value") = another value

choose(int(test_score/20),"F","D","C","B","A") = tells you the letter grade for the given score

Learn more here: http://chandoo.org/wp/?s=Choose+formula

Iserror

What it does?

Checks if the input has error or not

Syntax

iserror(this value)

Example

iserror(1/0) = true

iserror(0/1) = false

Learn more here: http://chandoo.org/wp/?s=Iserror+formula

Isblank

What it does?

Checks if the input is blank or not

Syntax

isblank(this value)

Example

isblank(A1) = true if A1 is blank

isblank("") = false

Learn more here: http://chandoo.org/wp/?s=Isblank+formula

Isnumber

What it does?

Checks if the input is number of not

Syntax

isnumber(this value)

Example

isnumber(123) = true

isnumber("chandoo") = false

Learn more here: http://chandoo.org/wp/?s=Isnumber+formula

Istext

What it does?

Checks if the input is text or not

Syntax

istext(this value)

Example

istext(123) = false

istext("chandoo") = true

Learn more here: http://chandoo.org/wp/?s=Istext+formula

Iferror

Excel 2007 only

What it does?

An easy way to handle errors in formulas.

IFERROR returns the value you want incase of an error with the formula

Syntax

iferror(some formula, value to return incase of error)

Example

iferror(1/0,"cant divide by zero") = cant divide by zero

iferror(0/1,"cant divide by zero") = 0

Learn more here: http://chandoo.org/wp/?s=Iferror+formula

Text Formulas

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Concatenate

What it does?

Adds a bunch of text values to one another

Interesting Tip

You can use & operator instead of concatenate(). For eg. ="one"&"big"&"text" works the same way as example 1

Syntax

concatenate(this, [to this..])

Example

concatenate("one ","big ","text") = one big text

concatenate(A1,A2,A3) = adds the text values in A1,A2 and A3

Learn more here: http://chandoo.org/wp/?s=Concatenate+formula

Left

What it does?

Cuts a text from left

Syntax

left(from this text, this many letters)

Example

left("Pointy Haired Dilbert rocks", 6) = Pointy

left(A1,5) = first five characters in the cell A1

Learn more here: http://chandoo.org/wp/?s=Left+formula

Mid

What it does?

Gets a portion of text

Syntax

mid(from this text, start here, this many letters)

Example

mid("hello",2,3) = ell

mid("hello",2,99) = ello

Learn more here: http://chandoo.org/wp/?s=Mid+formula

Lower

What it does?

Converts a text to lower case

Syntax

lower(this text)

Example

lower("Hello") = hello

lower("hELLo") = hello

Learn more here: http://chandoo.org/wp/?s=Lower+formula

Upper

What it does?

Gets you upper case text from given one

Syntax

upper(this text)

Example

upper("hello") = HELLO

upper("hELLo") = HELLO

Learn more here: http://chandoo.org/wp/?s=Upper+formula

Proper

What it does?

Converst text to proper case

Syntax

proper(this text)

Example

proper("hello world") = Hello World

proper("Hello world") = Hello World

Learn more here: http://chandoo.org/wp/?s=Proper+formula

Len

What it does?

Tells you the length of a given text

Syntax

len(of this text)

Example

len("hello") = 5

len(A1) = length of the value in cell A1

Learn more here: http://chandoo.org/wp/?s=Len+formula

Find

What it does?

Finds the position of a text in another text

Syntax

find(this, in this text, [start here])

Example

find("e","hello") = 2

find("m","hello") = ERROR

Learn more here: http://chandoo.org/wp/?s=Find+formula

Trim

What it does?

Removes un-necessary spaces in a given text

Syntax

trim(this text)

Example

trim(" unusally spaced text ") = unusually spaced text

Learn more here: http://chandoo.org/wp/?s=Trim+formula

Dollar

What it does?

converts a number to $ currency format. Uses your local currency settings

Syntax

dollar(value, [number digits of decimal point])

Example

dollar(2300,2) = $ 2,300.00

Note: Dollar() uses your excel installation currency settings. So if you use someother currency like SEK, Rs. Euro, those symbols will appear

Learn more here: http://chandoo.org/wp/?s=Dollar+formula

Value

What it does?

Converts text to numbers

Syntax

value(from this text)

Example

value("1.2365") = 1.2365

value("hello") = ERROR

Learn more here: http://chandoo.org/wp/?s=Value+formula

Substitute

What it does?

Substitutes one text with another in the given text

Syntax

substitute(in this text, this text, with this text, [at this occurance])

Example

substitute("Pointy Haired Dilbert", "Pointy", "Curly") = Curly Haired Dilbert

substitute("123-123-1234","-","") = 1231231234

Learn more here: http://chandoo.org/wp/?s=Substitute+formula

Rept

What it does?

Repeats a particular text n number of times

Syntax

rept(this text, this many number of times)

Example

rept("|",5) = |||||

rept("And", 2) = AndAnd

Learn more here: http://chandoo.org/wp/?s=Rept+formula

Text

What it does?

Converts something in text to a number format (works for dates and times too)

Syntax

text(text value, format you want)

Example

text("2300","$0,00.00") = $2,300.00

Note: you can format the text value using any formatting code. Learn more about excel cell formatting codes from below links

Learn more here: http://chandoo.org/wp/?s=Text+formula

Type

What it does?

tells you the type of value in a cell

Syntax

type(of this value)

Example

type("chandoo") = 2

Type returns 1 if the input is number, 2 for text, 4 for logical values, 16 for error values and 64 for arrays

Learn more here: http://chandoo.org/wp/?s=Type+formula

Lookup & Reference Formulas

Excel Formula 1

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Vlookup

What it does?

Searches where a value is in a list, and then returns another value from the same row. Use when you need phone number based on name etc.

Syntax

vlookup(this value, in this list, and get me value in this column, [is-my-list-sorted?])

Example

vlookup("John", list, 2, false) = finds where John is in the list and returns the value in the 2nd column

Note: Use vlookup if your list is in rows and hlookup if your list is in columns

Learn more here: http://chandoo.org/wp/?s=Vlookup+formula

Hlookup

What it does?

Searches where a value is in a list, and then returns another value from the same column. Use when you need phone number based on name etc.

Syntax

hlookup(this value, in this list, and get me value in this row, [is-my-list-sorted?])

Example

hlookup("John", list, 2, false) = finds where John is in the list and returns the value in the 2nd row

Note: Use vlookup if your list is in rows and hlookup if your list is in columns

Learn more here: http://chandoo.org/wp/?s=Hlookup+formula

Match

What it does?

finds the location of a value in a range of cells

Syntax

match(what to find, in this list,type of match)

Example

match("bill gates", customer_list,0) = tells you position of customer named "bill gates" in the customer_list

match(23, scores_list,1) = gets the position of first score greaters than 23 in the scores_list (this should be sorted from low to high)

Learn more here: http://chandoo.org/wp/?s=Match+formula

Index

What it does?

gets you the value in a particular row (and column) of a given range of cells

Syntax

INDEX(range of cells, from this row, [and this column])

Example

INDEX(A1:C10,3,2) = gets you the value in cell B3 (which is 3rd and 2nd column in the range A1:C10

INDEX(A1:A10,15) = returns a #REF! error since there are only 10 values in the range A1:A10

Learn more here: http://chandoo.org/wp/?s=Index+formula

Row

What it does?

Tells you the current row number

Syntax

row([of this cell])

Example

row() = row number where you wrote this formula

row(C4) = 4

Learn more here: http://chandoo.org/wp/?s=Row+formula

Column

What it does?

Tells you the current column number

Syntax

column([of this cell])

Example

column() = column number where you wrote this formula

column(C4) = 3

Learn more here: http://chandoo.org/wp/?s=Column+formula

Statistical Formulas

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Min

What it does?

Finds the minimum of a given list of numbers

Syntax

min(of this list of numbers)

Example

min(1,2,3) = 1

min(A1:A20) = minimum value in the range A1:A20

Learn more here: http://chandoo.org/wp/?s=Min+formula

Max

What it does?

Finds the maximum of a given list of numbers

Syntax

max(of this list of numbers)

Example

max(1,2,3) = 3

max(A1:A20) = maximum value in the range A1:A20

Learn more here: http://chandoo.org/wp/?s=Max+formula

Small

What it does?

Finds the nth smallest number in a list

Syntax

small(from this list, nth smallest number)

Example

small(list, 2) = 2nd smallest number in the list

Learn more here: http://chandoo.org/wp/?s=Small+formula

Large

What it does?

Finds the nth largest number in a list

Syntax

large(from this list, nth largest number)

Example

large(list, 2) = 2nd largest number in the list

Learn more here: http://chandoo.org/wp/?s=Large+formula

Mode

What it does?

finds out the MODE of a list of values. Mode is a value with highest frequency in the list

Syntax

mode(list of values)

Example

mode(1,2,3,3,3,4,4,4,4,5,5,6,7) = 4

mode(1,2,3,4,5) = returns #N/A error since no value has highest frequency

Learn more here: http://chandoo.org/wp/?s=Mode+formula

Median

What it does?

finds the statistical median of a list of values

Syntax

median(list of values)

Example

median(3,4,5,1,2) = 3

median(1,1,2,2) = 1.5

Learn more here: http://chandoo.org/wp/?s=Median+formula

Rank

What it does?

tells you the rank of a number in a list of values

Syntax

rank(of this number, in this numbers, [order])

Example

rank(20,list of numbers) = rank of 20 in "list of numbers" (in descending order)

rank(20,list of numbers, 1) = rank of 20, but in ascending order

Learn more here: http://chandoo.org/wp/?s=Rank+formula

Percentile

What it does?

Gets the kth percentile value from a range of values

Syntax

percentile(range of values, percentile)

Example

percentile(scores_list,0.83) = gets the 83rd percentile value from scores_list

Learn more here: http://chandoo.org/wp/?s=Percentile+formula

Date & Time Formulas

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Today

What it does?

Today's date

Syntax

today()

Example

today() = today's date

Learn more here: http://chandoo.org/wp/?s=Today+formula

Now

What it does?

Today's date along with current time

Syntax

now()

Example

now() = today's date along with current time

Learn more here: http://chandoo.org/wp/?s=Now+formula

Year

What it does?

Tells you the year from a given date

Syntax

year(of this date)

Example

year("12/31/1981") = 1981

year(today()) = current year

Learn more here: http://chandoo.org/wp/?s=Year+formula

Month

What it does?

Tells you the month from a given date

Syntax

month(of this date)

Example

month("12/31/1981") = 12

month(today()) = current month

Learn more here: http://chandoo.org/wp/?s=Month+formula

Day

What it does?

Tells you the day of month from a given date

Syntax

day(of this date)

Example

day("12/31/1981") = 31

day(today()) = current day

Learn more here: http://chandoo.org/wp/?s=Day+formula

Weekday

What it does?

Tells you the day of week from a given date

Syntax

weekday(of this date)

Example

weekday("12/12/1981") = 7

weekday(today()) = current day of week

Learn more here: http://chandoo.org/wp/?s=Weekday+formula

Hour

What it does?

Tells you the hour from a given time

Syntax

hour(at this time)

Example

hour("11:30") = 11

hour(now()) = current hour

Learn more here: http://chandoo.org/wp/?s=Hour+formula

Minute

What it does?

Tells you the minutes from a given time

Syntax

minute(at this time)

Example

minute("11:30") = 30

minute(now()) = current minutes

Learn more here: http://chandoo.org/wp/?s=Minute+formula

Second

What it does?

Tells you the seconds from a given time

Syntax

second(at this time)

Example

second("11:30:45") = 45

second(now()) = current seconds

Learn more here: http://chandoo.org/wp/?s=Second+formula

Datevalue

What it does?

Converts a date in the text format to excel date format (remember, you still need to format it)

Syntax

datevalue(from this text)

Example

DATEVALUE("31/12/2001") = 37256 (which is the excel's way of saying it is 31st December 2001)

Note: Date value depends on your computer's settings. So if you use MM/DD/YYYY dates in your country, they work in the datevalue

Learn more here: http://chandoo.org/wp/?s=Datevalue+formula

Timevalue

What it does?

Converts a time in text format to excel time value

Syntax

timevalue(from this text)

Example

timevalue("12:30 am") = 0.020833333 (which is excel's way of saying it is almost beyond bed time)

timevalue("22:00") = 0.916666667 (it works with 24H format too)

Learn more here: http://chandoo.org/wp/?s=Timevalue+formula

Networkdays

What it does?

Tells you how many working days are there between 2 given dates

Syntax

networkdays(from this date, to this date, [add this holidays as well])

Example

networkdays("12/1/2008","12/31/2008") = 23

networkdays(TODAY(),TODAY()+30) =
total working days in next 30 days

Learn more here: http://chandoo.org/wp/?s=Networkdays+formula

Financial Formulas

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Npv

What it does?

Calculates net present value from a series of future payments

Syntax

npv(at this rate, list of payments)

Example

npv(10%,100,100,100,100,100) = 379.07

Learn more here: http://chandoo.org/wp/?s=Npv+formula

Fv

What it does?

Finds out how much a series of payments is worth in future

Syntax

fv(at this rate, this many payments, of each)

Example

fv(10%,12,-1000) = 21,384.28

Learn more here: http://chandoo.org/wp/?s=Fv+formula

Pmt

What it does?

Tells you how much you should pay on your mortage (every month ..)

Syntax

pmt(at this rate, this many payments, for this much amount)

Example

pmt(10%,12,-100000) = 14676.33

Learn more here: http://chandoo.org/wp/?s=Pmt+formula

Ipmt

What it does?

Tells you how much of your mortgage goes towards interest in specified month

Syntax

ipmt(at this rate, on this payment, out of this many payments, for this much amount)

Example

ipmt(10%,3,12,-100000) = 9017.97

Learn more here: http://chandoo.org/wp/?s=Ipmt+formula

Ppmt

What it does?

Tells you how much of your mortgage goes towards principle in specified month

Syntax

ppmt(at this rate, on this payment, out of this many payments, for this much amount)

Example

ppmt(10%,3,12,-100000) = 5658.36

Learn more here: http://chandoo.org/wp/?s=Ppmt+formula

List of Formulas Covered in This Book

Math Formulas		Logical	Text	Lookup	Statistical	Date & Time	Financial
Sum	Rand	If	Concatenate	Vlookup	Min	Today	Npv
Count	Randbetween	And	Left	Hlookup	Max	Now	Fv
Average	Subtotal	Or	Mid	Match	Small	Year	Pmt
Countif	Sign	Not	Lower	Index	Large	Month	Ipmt
Sumif	Product	Choose	Upper	Row	Mode	Day	Ppmt
Averageif	Abs	Iserror	Proper	Column	Median	Weekday	
Countblank	Floor	Isblank	Len		Rank	Hour	
Round	Ceiling	Isnumber	Find		Percentile	Minute	
Int	Roman	Istext	Trim			Second	
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Looking for More Material on Excel Formulas ?

For more information on excel formulas, do visit the following links:

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http://chandoo.org/wp/category/excel
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