# Calculating Cell Values with Formulas

## IMPLEMENTING OPERATIONS AND PERFORMING CALCULATIONS WITH FUNCTIONS AND FORMULAS

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# Course Pattern

**Introduction to the topic or type of action**

**Reasons for performing said action**

**Practical implementation**

# Module Overview

**Calculations with aggregate functions**

**Logical operators and functions**

**Statistical functions**

# Aggregate Functions – SUM and COUNT

# Functions in Excel

**Functions in excel are predefined formulas that perform calculations using specific values in a particular order**

<div style="text-align:center">

=      YEAR()      (date)

</div>

| Equal sign | Function name | Argument |
|---|---|---|
| Functions and formulas start with an equal sign | Unique identifier that tells Excel what we are trying to cook up | Arguments contain the information you want to calculate |

# SUM Function

Returns sum of all numbers in a range of cells/supplied values

Values  - numbers, cell references, ranges, arrays and constants

=SUM(number1, [number2], [number[3], ...)

Up to 255 individual arguments, ignores text

# COUNT Function

Returns the count of the numbers in the supplied values

Values – constants, cell references or ranges

=COUNT(value1, [value2[, [value3], …)

Ignores error, text, logical values, and empty cells

# Aggregate Functions – MIN, MAX and AGGREGATE

# MIN and MAX Functions

MIN returns smallest numeric value in a range of values

MAX returns largest numeric value in a range of values

=MIN(num1, [num2], ...)

=MAX(num1, [num2], ...)

255 arguments. Returns 0 if no numbers

255 arguments. Returns 0 if no numbers

=AGGREGATE()

Introduced in 2010

Can perform the actions of multiple functions – sum, count, average, min etc.
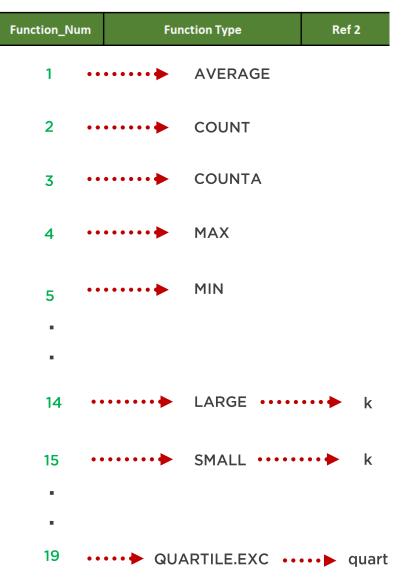
Speciality – ignores errors and hidden rows

=AGGREGATE (function_num, options, ref1, [ref2])

Designed for vertical ranges

# AGGREGATE Function – Function Num

| Function_Num | Function Type | Ref 2 |
|---|---|---|

1 ·········▶ AVERAGE

2 ·········▶ COUNT

3 ·········▶ COUNTA

4 ·········▶ MAX

5 ·········▶ MIN

.

.

14 ·········▶ LARGE ·········▶ k

15 ·········▶ SMALL ·········▶ k

.

.

19 ·······▶ QUARTILE.EXC ·····▶ quart

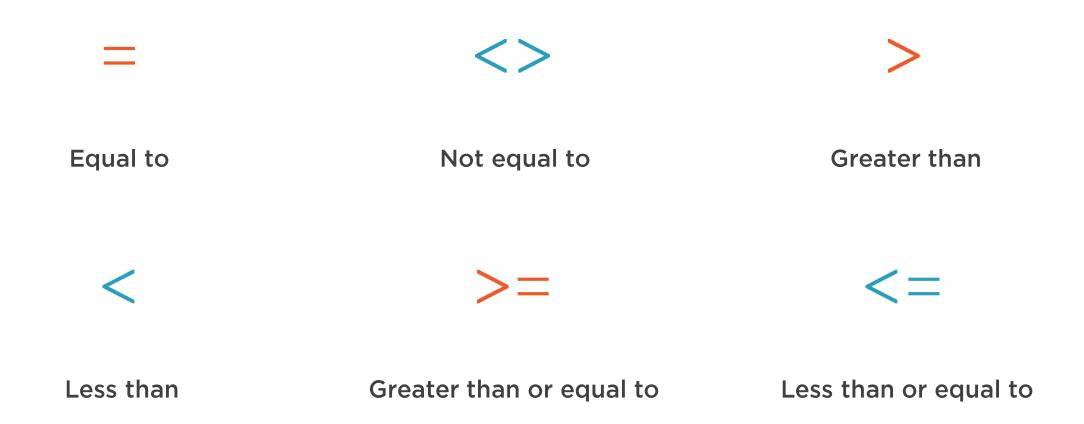# AGGREGATE Function – Options

| Option | Behaviour |
|--------|-----------|

0 ••••▶ Ignore SUBTOTAL and AGGREGATE functions

1 ••••▶ Ignore hidden rows, SUBTOTAL and AGGREGATE functions

2 ••••▶ Ignore error values, SUBTOTAL and AGGREGATE functions

3 ••••▶ Ignore hidden rows, error values, SUBTOTAL and AGGREGATE functions

4 ••••▶ Ignore nothing

5 ••••▶ Ignore hidden rows

6 ••••▶ Ignore error values

7 ••••▶ Ignore hidden rows and error values

# Logical Operators and Functions in Excel

# Logical Operators in Excel

=

**Equal to**

<>

**Not equal to**

>

**Greater than**

<

**Less than**

>=

**Greater than or equal to**

<=

**Less than or equal to**

# Logical Functions – AND and OR

**AND – returns true if all arguments evaluate to true**

=AND(A1>5, A2<3)

**OR – returns true if any arguments evaluate to true**

=OR(A1>5, A2<3)

# Logical Functions – XOR and NOT

**XOR - returns a logical Exclusive Or of all arguments**

**=XOR(A1>5, A2<3)**

**NOT – returns the reversed logical value of its argument**

**=NOT(A1>=5)**

# Logical Functions – IF

**IF – checks if a condition is met, and returns one value if true and another if false**

**=IF (logical_test, [value_if_true], [value_if_false])**

# AVERAGE, MEDIAN, MODE and STDDEV

Average (or mean) returns average of all the values supplied as input

=AVERAGE(num1, [num2], ...)

Median returns the middle number in a supplied group of numbers

=MEDIAN(num1, [num2], ...)

Mode returns most frequent number in a supplied group of numbers

=MODE(num1, [num2], ...)

Stddev returns the standard deviation of a dataset

=STDDEV(num1, [num2], ...)

# Statistical Functions – SUMIF, COUNTIF and AVERAGEIF

# SUMIF, COUNTIF and AVERAGEIF

Computes the result based on some criteria

SUMIF returns the sum of cells that match the supplied criteria

=SUMIF (range, criteria, [sum_range])

COUNTIF counts cells that meet a criteria

=COUNTIF (range, criteria)

AVERAGEIF returns average of numbers that meet a criteria

=AVERAGEIF (range, criteria, [average_range])

# Module Summary

**Aggregate functions – sum, count, min, max and aggregate**

**Logical functions – and, or, xor, not and if**

**Statistical functions – average, mean, mode, stddev, sumif, countif and averageif**