

VBA Data Types

Variant	any data type
Integer	(2 bytes) integer
Long	(4 bytes) integer
Single	(4 bytes) floating point
Double	(8 bytes) floating point
String	non-numeric data (declared with quotes)
Object	any object reference
Date	a date
Boolean	True / False
Byte	0-255

Operators (Syntax)

Comparison	=, <> (not equal to), >, <, >=, <=
Logical (Boolean)	NOT (opposite), AND (if all <i>true</i> then returns true), OR (at least 1 <i>true</i> returns true)
Mathematical	+, -, *, /, \ (integer division), Mod (remainder), ^ (remember to put space)

String Concatenation &

The concatenate operator eg. "A" & "B" becomes "AB".

Operators (Precedence)

1	^
2	* OR / (division)
3	\ (integer division)
4	Mod
5	+ OR -

Declarations

Variables	Dim [varname] As [type]
Arrays	Dim [array name (index)] As [type]
Re-declare Array	ReDim [array name (new index?)] As [new type]
ReDim and keep values	ReDim Preserve [arrayname (newindex?)] As [new type]

Option Explicit is used to require declarations of all variables. Option Base 1 makes the index of all arrays starts from 1. If declared array has no numeral index provided, then it is dynamic in size.

Data Functions (Conversions)

...value to a boolean	CBool (value)
...value to a integer	CInt (value)
...value to a double	CDbl (value)
...value to a string	CStr (value)

Val function accepts a string as input and returns the numbers found in that string.

Math Functions

Absolute	Abs ([numeric value])
Square root	Sqr ([numeric value])
Exponential, <i>e</i>	Exp ([numeric value])
Natural log, <i>ln</i>	Log ([numeric value])
Is it a number (boolean)?	IsNumeric ([numeric value])
Truncate to integer	Int ([numeric value])
(Num1 / Num2) remainder?	[Num2] Mod [Num2]
Round to a decimal place	Round ([numeric value], [# of digits])

Sin/Cos/Tan for trigonometric functions, **ASin/ACos/ATan** for inverse trig functions.



By **takshimaro**

Published 11th December, 2014.

Last updated 8th May, 2016.

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String Functions

All upper case	UCase ([string value])
All lower case	LCase ([string value])
Length of string (integer)	Len ([string value])
Filters a string to a double	Val ([string value])
Convert number to string	Str ([numeric value])

Val function accepts a string as input and returns the numbers found in that string.

User Interaction and Cell Selection

A popup dialog box
MsgBox " dialogue " [& variable etc.]

Prompt user for input
InputBox ("di alo gue ")

...a single cell A1
Range ("A1 ").S elect

...an active cell
ActiveCell.Select

...a contiguous range
Range ("A1 :G5 ").S elect

...offset and select
[**ActiveCell/Range**(#)].O ffs et(1,0).S - elect

...set a cell's value
[**ActiveCell/Range**(#)].Value = [varname]

Use **Range** to select specific cells or group of cells. Use **ActiveCell** to select highlighted cell in excel.

Array Functions

Highest element number
UBound(ArrayName [, Dimension])

Lowest element number
LBound(ArrayName [, Dimension])

Highest element number is the size of possible entries a array can hold.

Array Iteration

```
Function MinIntegerofArray(TheArray As Variant) As Integer
Dim i As Integer, placeh older As Integer
placeh older = 0
For i = 1 To UBound (Th eArray)
    If TheArr ay(i) < TheArr ay( pla ceh older)
Then
        pla ceh older = i
    End If
Next
'index of min value is at placeh older
MinInt ege rof Array = TheArr ay( pla ceh older)
End Function
```

Error Handling with GoTo & Labels

```
...
tempst ude ntName = InputB ox( " Please enter
student name (type exit to end): ")
'error check and force reentry of input
    If IsText (te mps tud ent Name) = False Then
checker1:
        tem pst ude ntName = InputB -
ox( " Please enter a valid student name [not blank
and letter] (type exit to end): ")
        End If

    If tempst ude ntName = " exi t" Then
        End '(the program)
    ElseIf IsText (te mps tud ent Name) =
False Then
        GoTo checker1 'label

    Else
        stu den tName = tempst ude ntName
    End If
```

...

'checker1:' is a label: labels only include the next line



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Published 11th December, 2014.

Last updated 8th May, 2016.

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IsText, Case Statements, For loop

```
Function IsText(streng As Variant) As Boolean
    Dim i As Integer
    For i = 1 To Len(st reng)
        'checks if the text follows the ACII
numerials (a-z AND A-Z)

        Select Case Asc(Mi d(s treng, i,
1))

            Case 65 To 90, 97 To 122
                IsText = True

            Case Else
                IsText = False
                Exit For

        End Select

    Next
End Function
```



By **takshimaro**

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Published 11th December, 2014.

Last updated 8th May, 2016.

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