무료 전자 책

배우기

excel-vba

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#excel-vba

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1: excel-vba

Microsoft Excel VBA . .

1. Excel . Excel Excel VBA .
2. .
3. Microsoft Word, PowerPoint, Internet Explorer, Excel .

VBA Visual Basic for Applications . 1990 Microsoft Excel Visual Basic .

excel-vba Microsoft Excel VBA . VBA .

- :

  ✓
  ✓ `WorksheetFunction`
  ✓ `xlDirection`

- :

  "for each '
  ✗ `MsgBox`
  V *VBA WinAPI*

VB

VB6	1998-10-01
VB7	2001-06-06
WIN32	1998-10-01
WIN64	2001-06-06
	1998-10-01

16	2016-01-01
15	2013-01-01
14	2010-01-01
12	2007-01-01

11	2003-01-01
10	2001-01-01
9	1999-01-01
8	1997-01-01
7	1995-01-01
5	1993-01-01
2	1987-01-01

Examples

VBA `Dim` . `Variant` .

`Option Explicit` ("Option Explicit").

/ / `Option Explicit` .

```
Option Explicit

Sub Example()
    Dim a As Integer
    a = 2
    Debug.Print a
    'Outputs: 2

    Dim b As Long
    b = a + 2
    Debug.Print b
    'Outputs: 4

    Dim c As String
    c = "Hello, world!"
    Debug.Print c
    'Outputs: Hello, world!
End Sub
```

, `Variant` .

```
Dim Str As String, IntOne, IntTwo As Integer, Lng As Long
Debug.Print TypeName(Str)     'Output: String
Debug.Print TypeName(IntOne) 'Output: Variant <--- !!!
Debug.Print TypeName(IntTwo) 'Output: Integer
Debug.Print TypeName(Lng)     'Output: Long
```

($ % &! # @) .

```
 Dim this$  'String
```

```
Dim this%  'Integer
Dim this&  'Long
Dim this!  'Single
Dim this#  'Double
Dim this@  'Currency
```

▪

- `Static` : `Static CounterVariable as Integer`

  Dim Static .

- `Public` like : `Public CounterVariable as Integer`

  . .

- `Private` : `Private CounterVariable as Integer`

  .

:

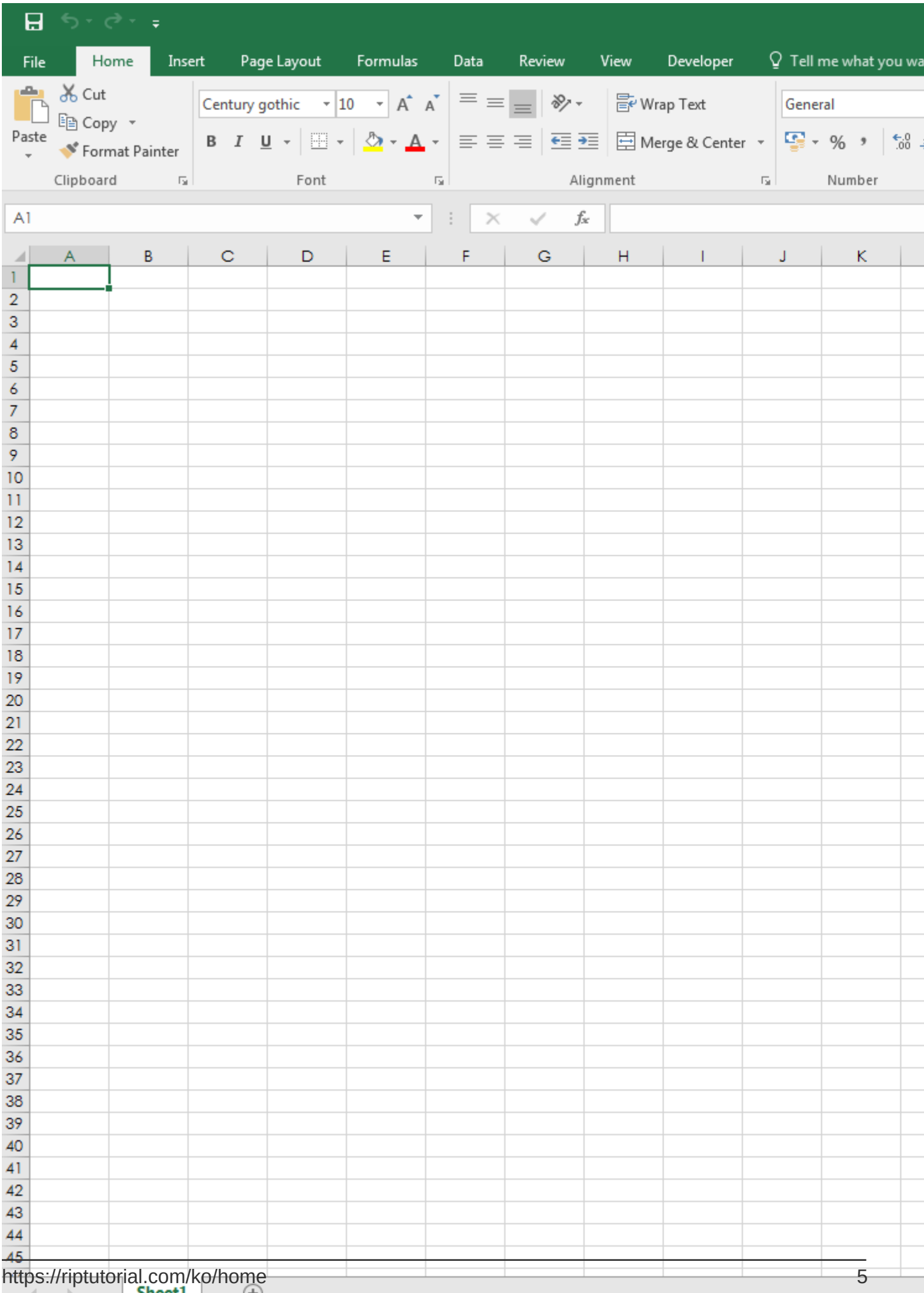
MSDN

(Visual Basic)

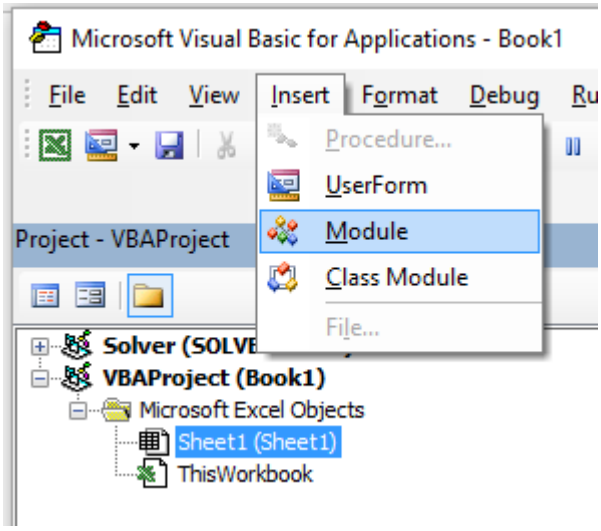
Visual Basic Editor (VBE)

---

1 :


File
Home
Insert
Page Layout
Formulas
Data
Review
View
Developer
Tell me what you wa
Cut
Copy
Paste
Format Painter
Clipboard
Century gothic
10
Font
Wrap Text
Merge & Center
Alignment
General
Number
A1
Sheet1

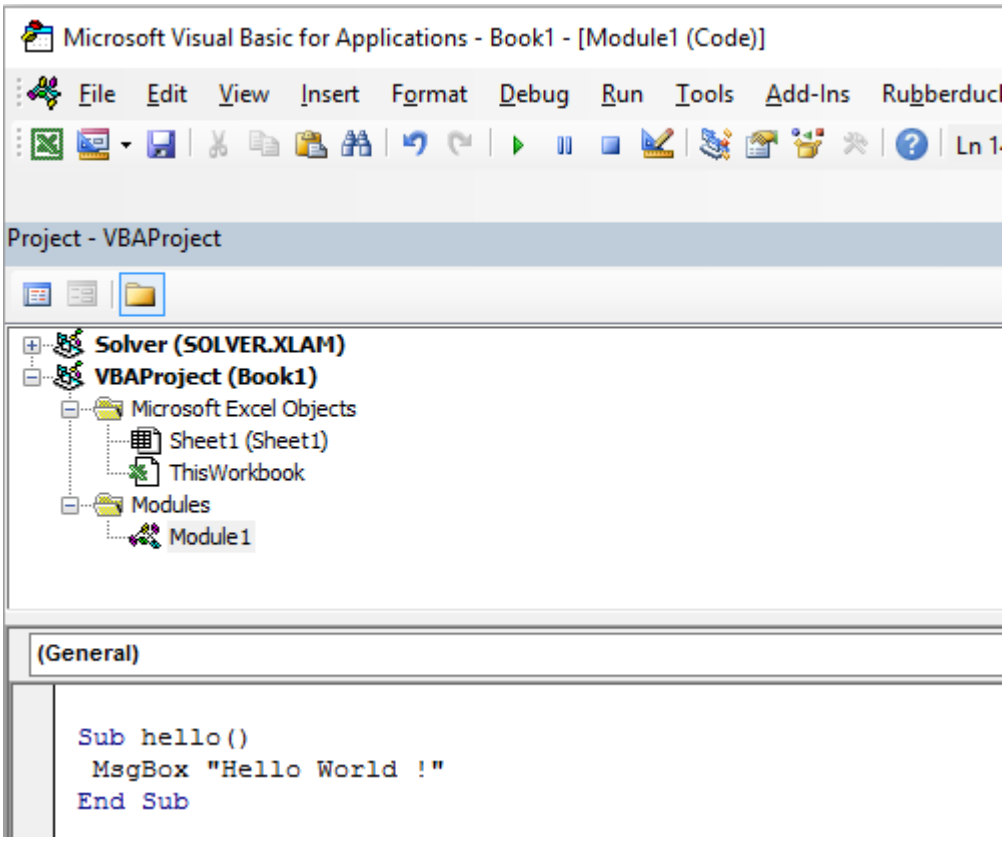
2. -> .



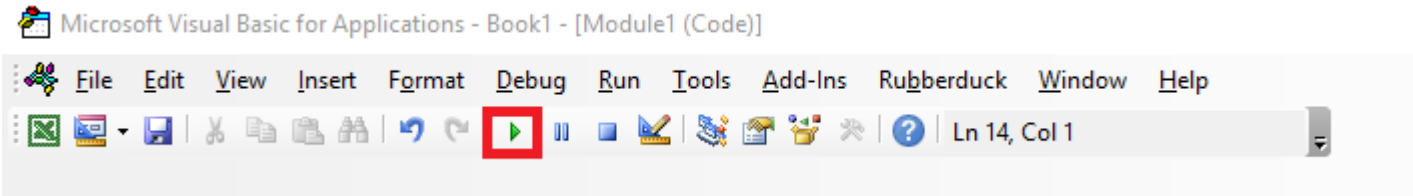
3. .

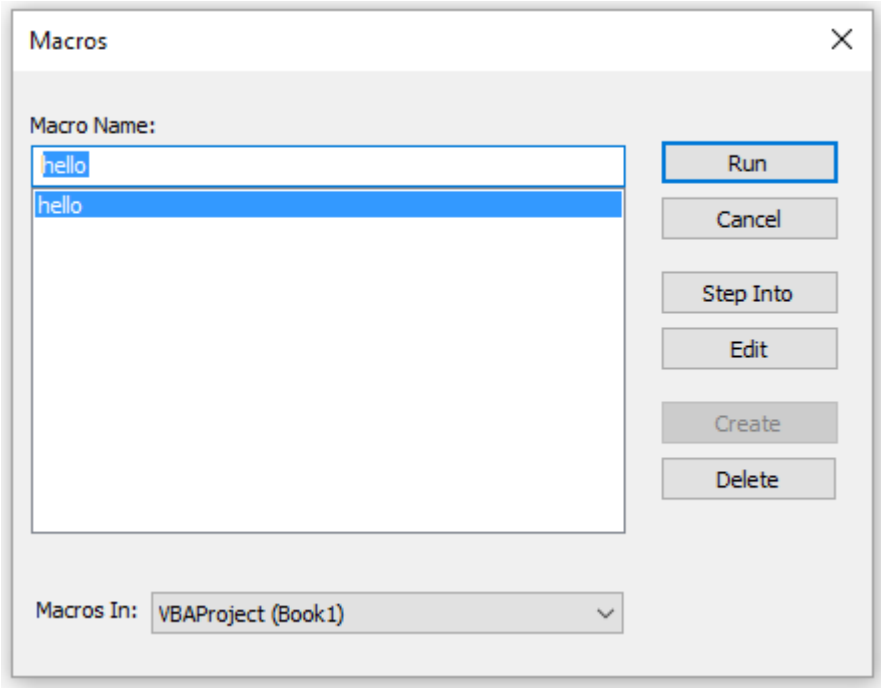
```
Sub hello()
  MsgBox "Hello World !"
End Sub
```

:



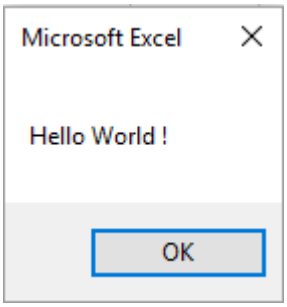
4. Visual Basic "" (F5) .





5. "hello" `Run` `Run` :

6. .

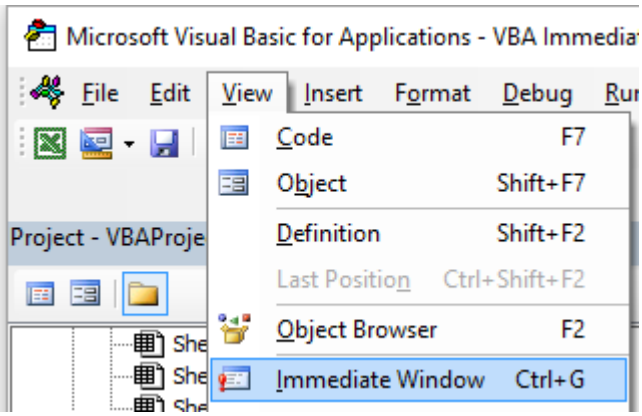


Excel

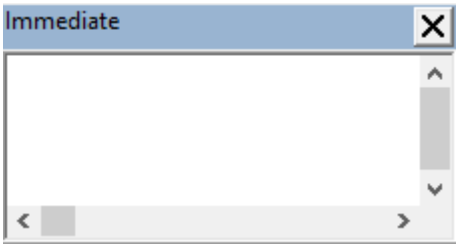
Excel Object Model .

---

1. VBE (Visual Basic Editor) .
2. -> (`ctrl` + `G`) .



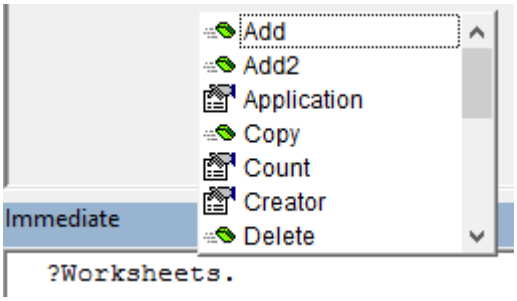
3. VBE .



VBA . . .

```
?Worksheets.
```

VBE .



`.Cout` `.Cout` .

```
?Worksheets.Count
```

4. Enter . 1 . . (`?`) Debug.Print .

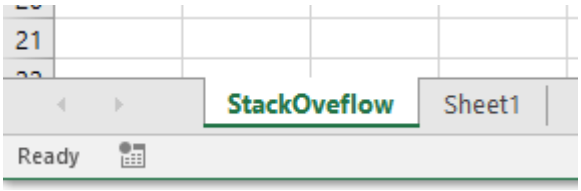
Object Count . Excel (`Workbook` , `Worksheet` , `Range` , `Chart` ..) . Excel VBA . .

Excel VBA Excel .

5. (`?`) :

```
Worksheets.Add().Name = "StackOveflow"
```

6. . `StackOverflow.` `StackOverflow.` :



Excel Add . .

```
Add:  Creates a new worksheet, chart, or macro sheet.
The new worksheet becomes the active sheet.
Return Value: An Object value that represents the new worksheet, chart,
 or macro sheet.
```

`Worksheets.Add()` . ( ) Object `Name` ( ). :

```
Worksheet.Name Property:  Returns or sets a String value that
 represents the object name.
```

`Worksheets.Add().Name = "StackOveflow"` `Worksheets.Add().Name = "StackOveflow"` .

`Add()` Name "StackOverflow" .

. Excel . Excel . `Worksheet` `WorkSheets` . Object .

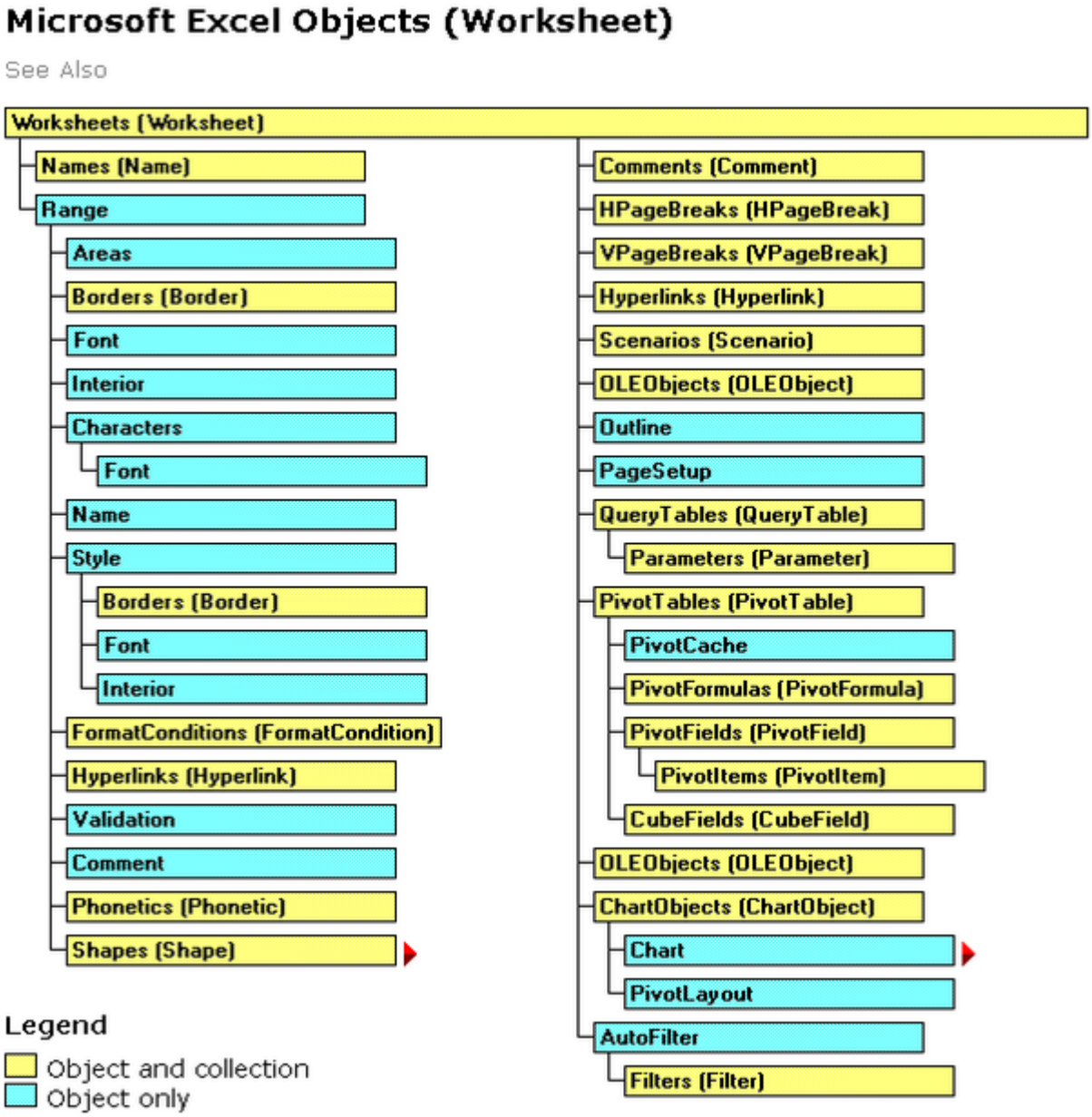
Excel Excel .

`Application` Excel . VBA . / .

( ) Excel Object Model .

```
Application
 Workbooks
 Workbook
Worksheets
 Worksheet
  Range
```

Excel 2007 ,



Excel .

Excel `events` (: `Workbook.WindowActivate`) .

excel-vba : https://riptutorial.com/ko/excel-vba/topic/777/excel-vba-

2: Excel VBA

SO . Excel "" .

Examples

xlVeryHidden

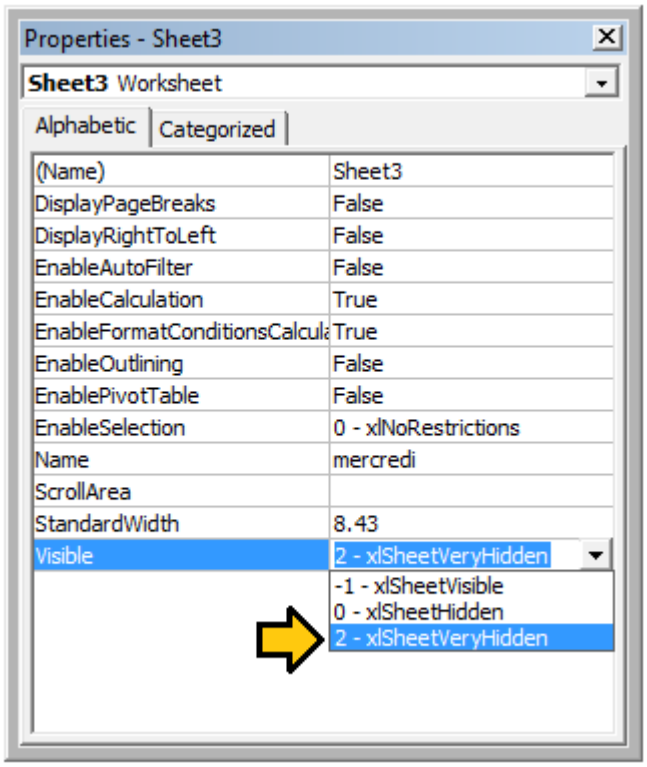
`Visible` . `xlSheetVisibility` .

1. `xlVisible` `xlSheetVisible` : `-1` ( )
2. `xlHidden` `xlSheetHidden` : `0`
3. `xlVeryHidden` `xlSheetVeryHidden` `xlVeryHidden` : `2`

. . . '' Excel .

Visual Basic Editor . Excel . VBA .

.Visible xlSheetVeryHidden VBE (`F4`) 13 .



.Visible xlSheetVeryHidden[1] .Visible .

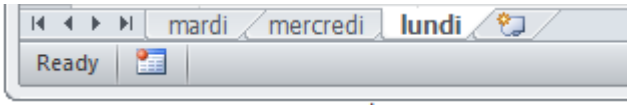
```
with Sheet3
    .Visible = xlSheetVeryHidden
end with
```

[1] **xlVeryHidden xlSheetVeryHidden 2 ( ).**

.Name, .Index .CodeName

' ' . .Name , .Index .CodeName . .

. , , 3 VBA . . .



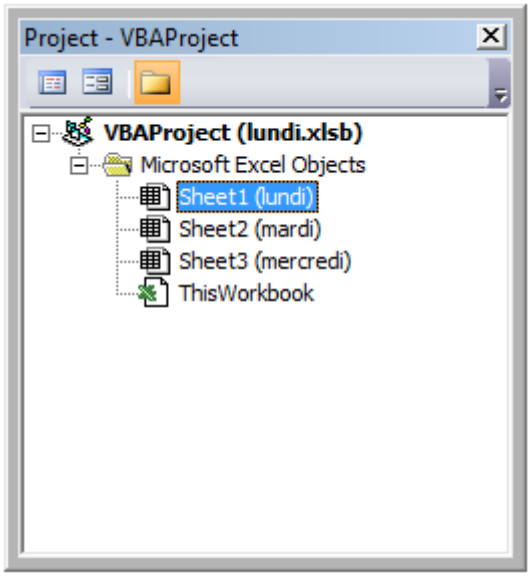
.

```
'reference worksheet by .Name
with worksheets("Monday")
    'operation code here; for example:
    .Range(.Cells(2, "A"), .Cells(.Rows.Count, "A").End(xlUp)) = 1
end with

'reference worksheet by ordinal .Index
with worksheets(1)
    'operation code here; for example:
    .Range(.Cells(2, "A"), .Cells(.Rows.Count, "A").End(xlUp)) = 1
end with
```

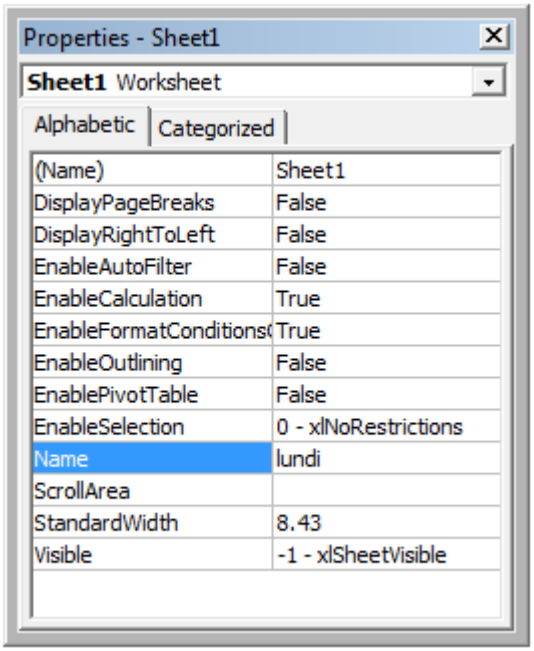
. .CodeName .

```
with Sheet1
    'operation code here; for example:
    .Range(.Cells(2, "A"), .Cells(.Rows.Count, "A").End(xlUp)) = 1
end with
```

VBA ([Ctrl] + R) . .CodeName, .Name ( ) . . .Index .



.CodeName . VBE Properties ([F4]) .



. . .Name . .

VBA . (Strings, Numbers, Booleans) `Split()` VBA `ReDim Preserve` . ListBox .

```
Private Sub UserForm_Initialize()

Dim Count As Long, DataString As String, Delimiter As String

For Count = 1 To ActiveSheet.UsedRows.Count
    If ActiveSheet.Range("A" & Count).Value <> "Your Condition" Then
        RowString = RowString & Delimiter & ActiveSheet.Range("A" & Count).Value
        Delimiter = "><" 'By setting the delimiter here in the loop, you prevent an extra
occurance of the delimiter within the string
    End If
Next Count

ListBox1.List = Split(DataString, Delimiter)

End Sub
```

`Delimiter` . . , . , - / . .

: (,). . VBA .

Excel

Excel "OnAction" . ( ) . VBA `OnAction` .

```
Public Const DOUBLECLICK_WAIT as Double = 0.25 'Modify to adjust click delay
Public LastClickObj As String, LastClickTime As Date

Sub ShapeDoubleClick()

    If LastClickObj = "" Then
```

```
        LastClickObj = Application.Caller
        LastClickTime = CDbl(Timer)
    Else
        If CDbl(Timer) - LastClickTime > DOUBLECLICK_WAIT Then
            LastClickObj = Application.Caller
            LastClickTime = CDbl(Timer)
        Else
            If LastClickObj = Application.Caller Then
                'Your desired Double Click code here
                LastClickObj = ""
            Else
                LastClickObj = Application.Caller
                LastClickTime = CDbl(Timer)
            End If
        End If
    End If

End Sub
```

.

-

debug.print .

```
Option Explicit

Sub OpenMultipleFiles()
    Dim fd As FileDialog
    Dim fileChosen As Integer
    Dim i As Integer
    Dim basename As String
    Dim fso As Variant
    Set fso = CreateObject("Scripting.FileSystemObject")
    Set fd = Application.FileDialog(msoFileDialogFilePicker)
    basename = fso.getBaseName(ActiveWorkbook.Name)
    fd.InitialFileName = ActiveWorkbook.Path ' Set Default Location to the Active Workbook
Path
    fd.InitialView = msoFileDialogViewList
    fd.AllowMultiSelect = True

    fileChosen = fd.Show
    If fileChosen = -1 Then
        'open each of the files chosen
        For i = 1 To fd.SelectedItems.Count
            Debug.Print (fd.SelectedItems(i))
            Dim fileName As String
            ' do something with the files.
            fileName = fso.getFileName(fd.SelectedItems(i))
            Debug.Print (fileName)
        Next i
    End If

End Sub
```

Excel VBA : https://riptutorial.com/ko/excel-vba/topic/2240/excel-vba--

3: Excel VBA SQL -

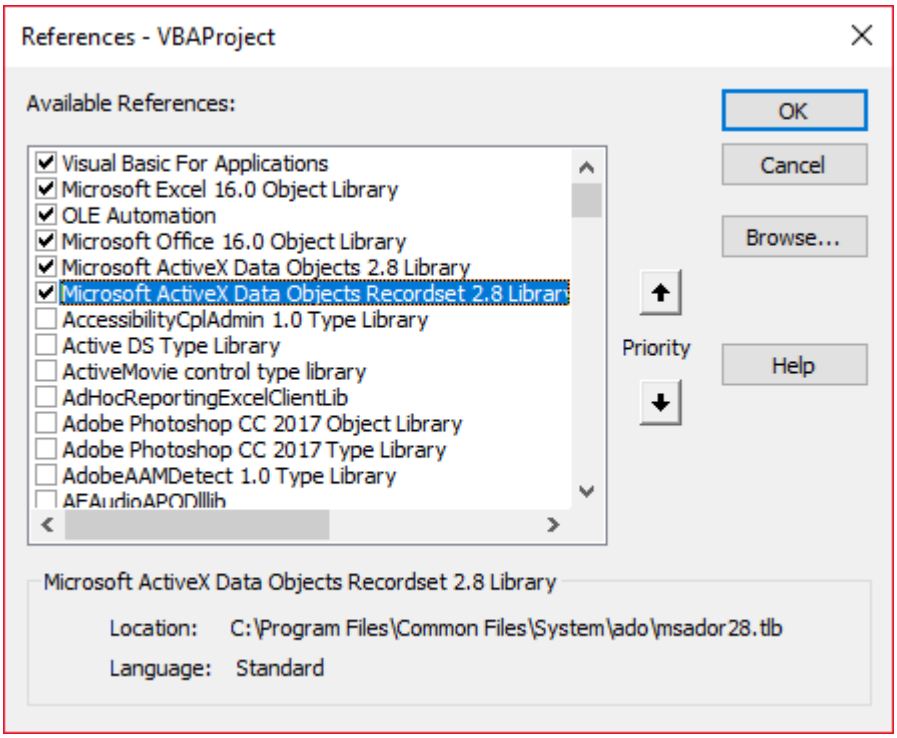
Examples

VBA ADODB.Connection ?

:

.

- Microsoft ActiveX 2.8
- Microsoft ActiveX Recordset 2.8




```
Private mDataBase As New ADODB.Connection
Private mRS As New ADODB.Recordset
Private mCmd As New ADODB.Command
```

. Windows

```
Private Sub OpenConnection(pServer As String, pCatalog As String)
    Call mDataBase.Open("Provider=SQLOLEDB;Initial Catalog=" & pCatalog & ";Data Source=" &
pServer & ";Integrated Security=SSPI")
    mCmd.ActiveConnection = mDataBase
```

```
End Sub
```

. SQL Server

```
Private Sub OpenConnection2(pServer As String, pCatalog As String, pUser As String, pPsw As
String)
    Call mDataBase.Open("Provider=SQLOLEDB;Initial Catalog=" & pCatalog & ";Data Source=" &
pServer & ";Integrated Security=SSPI;User ID=" & pUser & ";Password=" & pPsw)
    mCmd.ActiveConnection = mDataBase
End Sub
```

SQL

```
Private Sub ExecuteCmd(sql As String)
    mCmd.CommandText = sql
    Set mRS = mCmd.Execute
End Sub
```

```
Private Sub ReadRS()
    Do While Not (mRS.EOF)
        Debug.Print "ShipperID: " & mRS.Fields("ShipperID").Value & " CompanyName: " &
mRS.Fields("CompanyName").Value & " Phone: " & mRS.Fields("Phone").Value
        Call mRS.MoveNext
    Loop
End Sub
```

```
Private Sub CloseConnection()
    Call mDataBase.Close
    Set mRS = Nothing
    Set mCmd = Nothing
    Set mDataBase = Nothing
End Sub
```

?

```
Public Sub Program()
    Call OpenConnection("ServerName", "NORTHWND")
    Call ExecuteCmd("INSERT INTO [NORTHWND].[dbo].[Shippers]([CompanyName],[Phone]) Values
('speedy shipping','(503) 555-1234')")
    Call ExecuteCmd("SELECT * FROM [NORTHWND].[dbo].[Shippers]")
    Call ReadRS
    Call CloseConnection
End Sub
```

ShipperID : 1 CompanyName : Speedy Express : (503) 555-9831

ShipperID : 2 : : (503) 555-3199

ShipperID : 3 : : (503) 555-9931

ShipperID : 4 CompanyName : : (503) 555-1234

Excel VBA SQL - : https://riptutorial.com/ko/excel-vba/topic/9958/excel-vba-sql----

4: Excel-VBA

Excel-VBA . .

*) , -32,768 ~ 32,767 16 . . 10 .

Examples

. , . Sub .

```
Sub OptimizeVBA(isOn As Boolean)
    Application.Calculation = IIf(isOn, xlCalculationManual, xlCalculationAutomatic)
    Application.EnableEvents = Not(isOn)
    Application.ScreenUpdating = Not(isOn)
    ActiveSheet.DisplayPageBreaks = Not(isOn)
End Sub
```

.

```
Sub MyCode()

    OptimizeVBA True

    'Your code goes here

    OptimizeVBA False

End Sub
```

. :

```
time1 = Timer

For Each iCell In MyRange
   iCell = "text"
Next iCell

time2 = Timer

For i = 1 To 30
   MyRange.Cells(i) = "text"
Next i

time3 = Timer

debug.print "Proc1 time: " & cStr(time2-time1)
debug.print "Proc2 time: " & cStr(time3-time2)
```

MicroTimer :

```
Private Declare PtrSafe Function getFrequency Lib "Kernel32" Alias "QueryPerformanceFrequency"
```

```
(cyFrequency As Currency) As Long
Private Declare PtrSafe Function getTickCount Lib "Kernel32" Alias "QueryPerformanceCounter"
(cyTickCount As Currency) As Long

Function MicroTimer() As Double
    Dim cyTicks1 As Currency
    Static cyFrequency As Currency

    MicroTimer = 0
    If cyFrequency = 0 Then getFrequency cyFrequency        'Get frequency
    getTickCount cyTicks1                                   'Get ticks
    If cyFrequency Then MicroTimer = cyTicks1 / cyFrequency 'Returns Seconds
End Function
```

With

. , , with-blocks .

```
With ActiveChart
    .Parent.Width = 400
    .Parent.Height = 145
    .Parent.Top = 77.5 + 165 * step - replacer * 15
    .Parent.Left = 5
End With
```

.

```
ActiveChart.Parent.Width = 400
ActiveChart.Parent.Height = 145
ActiveChart.Parent.Top = 77.5 + 165 * step - replacer * 15
ActiveChart.Parent.Left = 5
```

:

- With . With .
- **With** . With With End With
- With With .
- With . With With In With In With Out With .

:

With .

.

```
With MyObject
    .Height = 100               'Same as MyObject.Height = 100.
    .Caption = "Hello World"    'Same as MyObject.Caption = "Hello World".
    With .Font
        .Color = Red            'Same as MyObject.Font.Color = Red.
        .Bold = True            'Same as MyObject.Font.Bold = True.
```

```
        MyObject.Height = 200   'Inner-most With refers to MyObject.Font (must be qualified
    End With
End With
```

MSDN

-

- .
- .
-
- .
- .

:

```
Option Explicit

'Deleted rows: 775,153, Total Rows: 1,000,009, Duration: 1.87 sec

Public Sub DeleteRows()
    Dim oldWs As Worksheet, newWs As Worksheet, wsName As String, ur As Range

    Set oldWs = ThisWorkbook.ActiveSheet
    wsName = oldWs.Name
    Set ur = oldWs.Range("F2", oldWs.Cells(oldWs.Rows.Count, "F").End(xlUp))

    Application.ScreenUpdating = False
    Set newWs = Sheets.Add(After:=oldWs)    'Create a new WorkSheet

    With ur    'Copy visible range after Autofilter (modify Criteria1 and 2 accordingly)
        .AutoFilter Field:=1, Criteria1:="<>0", Operator:=xlAnd, Criteria2:="<>"
        oldWs.UsedRange.Copy
    End With
    'Paste all visible data into the new WorkSheet (values and formats)
    With newWs.Range(oldWs.UsedRange.Cells(1).Address)
        .PasteSpecial xlPasteColumnWidths
        .PasteSpecial xlPasteAll
        newWs.Cells(1, 1).Select: newWs.Cells(1, 1).Copy
    End With

    With Application
        .CutCopyMode = False
        .DisplayAlerts = False
            oldWs.Delete
        .DisplayAlerts = True
        .ScreenUpdating = True
    End With
    newWs.Name = wsName
End Sub
```

Excel

WorkBook WorkSheet Excel .

- FastWB () On Off .
- FastWS () WorkSheet .
- ws
  -
  - .

```
Public Sub FastWB(Optional ByVal opt As Boolean = True)
    With Application
        .Calculation = IIf(opt, xlCalculationManual, xlCalculationAutomatic)
        If .DisplayAlerts <> Not opt Then .DisplayAlerts = Not opt
        If .DisplayStatusBar <> Not opt Then .DisplayStatusBar = Not opt
        If .EnableAnimations <> Not opt Then .EnableAnimations = Not opt
        If .EnableEvents <> Not opt Then .EnableEvents = Not opt
        If .ScreenUpdating <> Not opt Then .ScreenUpdating = Not opt
    End With
    FastWS , opt
End Sub
```

```
Public Sub FastWS(Optional ByVal ws As Worksheet, Optional ByVal opt As Boolean = True)
    If ws Is Nothing Then
        For Each ws In Application.ThisWorkbook.Sheets
            OptimiseWS ws, opt
        Next
    Else
        OptimiseWS ws, opt
    End If
End Sub
Private Sub OptimiseWS(ByVal ws As Worksheet, ByVal opt As Boolean)
    With ws
        .DisplayPageBreaks = False
        .EnableCalculation = Not opt
        .EnableFormatConditionsCalculation = Not opt
        .EnablePivotTable = Not opt
    End With
End Sub
```

Excel

```
Public Sub XlResetSettings()    'default Excel settings
    With Application
        .Calculation = xlCalculationAutomatic
        .DisplayAlerts = True
        .DisplayStatusBar = True
        .EnableAnimations = False
        .EnableEvents = True
        .ScreenUpdating = True
        Dim sh As Worksheet
        For Each sh In Application.ThisWorkbook.Sheets
            With sh
                .DisplayPageBreaks = False
```

```
                .EnableCalculation = True
                .EnableFormatConditionsCalculation = True
                .EnablePivotTable = True
            End With
        Next
    End With
End Sub
```

... ("Erl ")

. . .

(Err.Number) (Err.Description) . **ERL ,** , (BTW) *) .

Erl 0 .

```
Option Explicit


Public Sub MyProc1()
Dim i As Integer
Dim j As Integer
On Error GoTo LogErr
10     j = 1 / 0    ' raises an error
okay:
Debug.Print "i=" & i
Exit Sub

LogErr:
MsgBox LogErrors("MyModule", "MyProc1", Err), vbExclamation, "Error " & Err.Number
Stop
Resume Next
End Sub

Public Function LogErrors( _
           ByVal sModule As String, _
           ByVal sProc As String, _
           Err As ErrObject) As String
' Purpose: write error number, description and Erl to log file and return error text
  Dim sLogFile As String: sLogFile = ThisWorkbook.Path & Application.PathSeparator &
"LogErrors.txt"
  Dim sLogTxt  As String
  Dim lFile    As Long

' Create error text
  sLogTxt = sModule & "|" & sProc & "|Erl " & Erl & "|Err " & Err.Number & "|" &
Err.Description

  On Error Resume Next
  lFile = FreeFile

  Open sLogFile For Append As lFile
  Print #lFile, Format$(Now(), "yy.mm.dd hh:mm:ss "); sLogTxt
      Print #lFile,
  Close lFile
' Return error text
  LogErrors = sLogTxt
 End Function
```

'

```
Sub ShowLogFile()
Dim sLogFile As String: sLogFile = ThisWorkbook.Path & Application.PathSeparator &
"LogErrors.txt"

On Error GoTo LogErr
Shell "notepad.exe " & sLogFile, vbNormalFocus

okay:
On Error Resume Next
Exit Sub

LogErr:
MsgBox LogErrors("MyModule", "ShowLogFile", Err), vbExclamation, "Error No " & Err.Number
Resume okay
End Sub
```

Excel-VBA : https://riptutorial.com/ko/excel-vba/topic/9798/excel-vba-

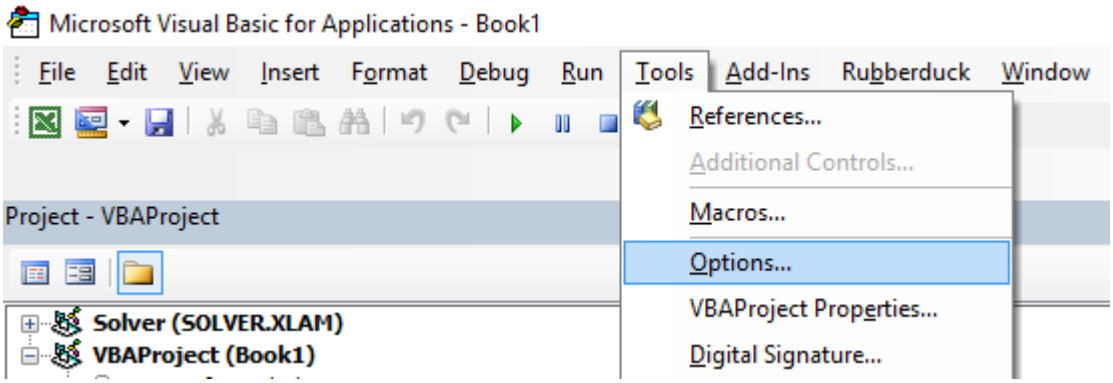
5: VBA

VBA .

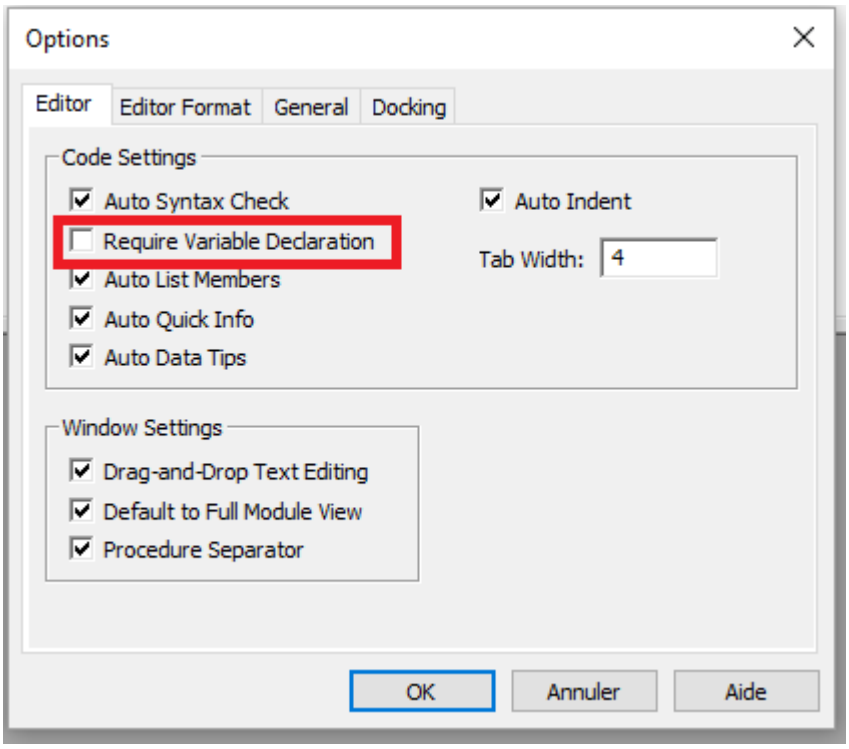
Examples

"Option Explicit" .

VBA "" .



"" " " .



`Option Explicit` VBA .

: , . "Require Variable Declaration" `Sheet1` `Option Explicit` !

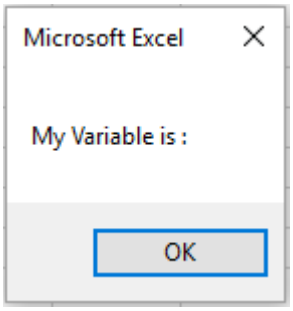
`Option Explicit` `Dim` . `Option Explicit` VBA `Variant` . `Option Explicit` .

:

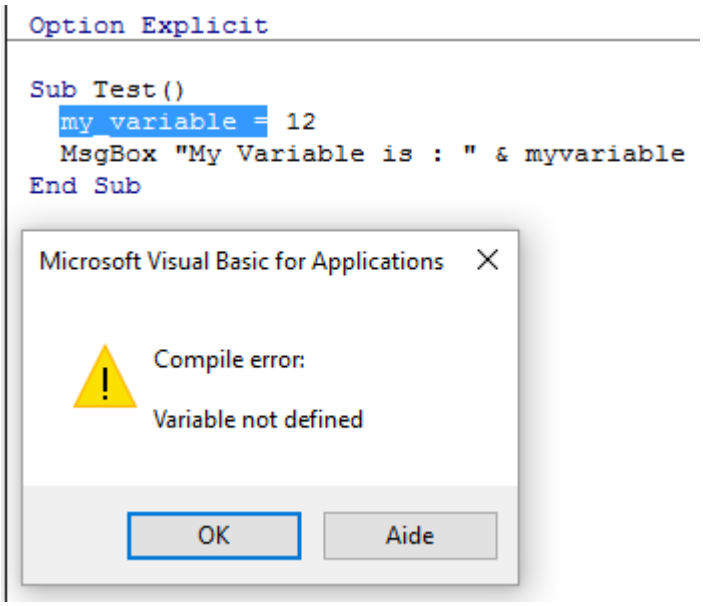
:

```
Sub Test()
  my_variable = 12
  MsgBox "My Variable is : " & myvariable
End Sub
```

.

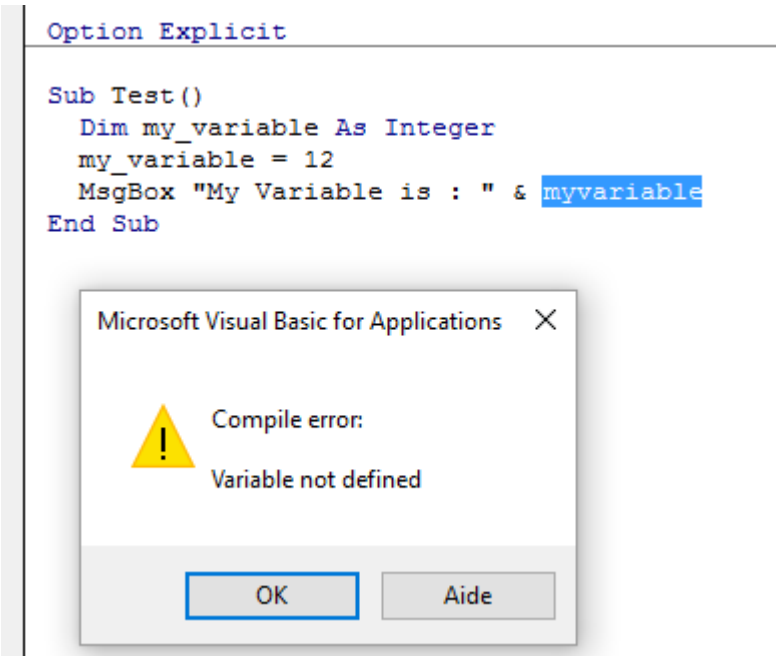


myvariable my_variable , . Option Explicit .




```
Sub Test()
  Dim my_variable As Integer
  my_variable = 12
  MsgBox "My Variable is : " & myvariable
End Sub
```

myvariable myvariable .



Option Explicit ( ) :

ReDim .

- ReDim .
- Option Explicit

```
Dim arr() as Long

ReDim ar() 'creates new array "ar" - "ReDim ar()" acts like "Dim ar()"
```

- Excel VBA

Range . Range Range Range . Range / 20 .

```
Option Explicit
Sub WorkWithArrayExample()

Dim DataRange As Variant
Dim Irow As Long
Dim Icol As Integer
DataRange = ActiveSheet.Range("A1:A10").Value ' read all the values at once from the Excel
grid, put into an array

For Irow = LBound(DataRange,1) To UBound(DataRange, 1) ' Get the number of rows.
  For Icol = LBound(DataRange,2) To UBound(DataRange, 2) ' Get the number of columns.
    DataRange(Irow, Icol) = DataRange(Irow, Icol) * DataRange(Irow, Icol) ' cell.value^2
  Next Icol
Next Irow
ActiveSheet.Range("A1:A10").Value = DataRange ' writes all the results back to the range at
once

End Sub
```

Timed Charles Williams VBA UDF (1) .

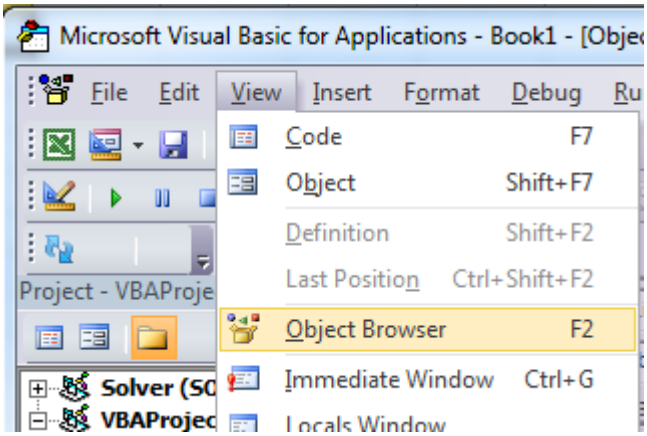
VB .

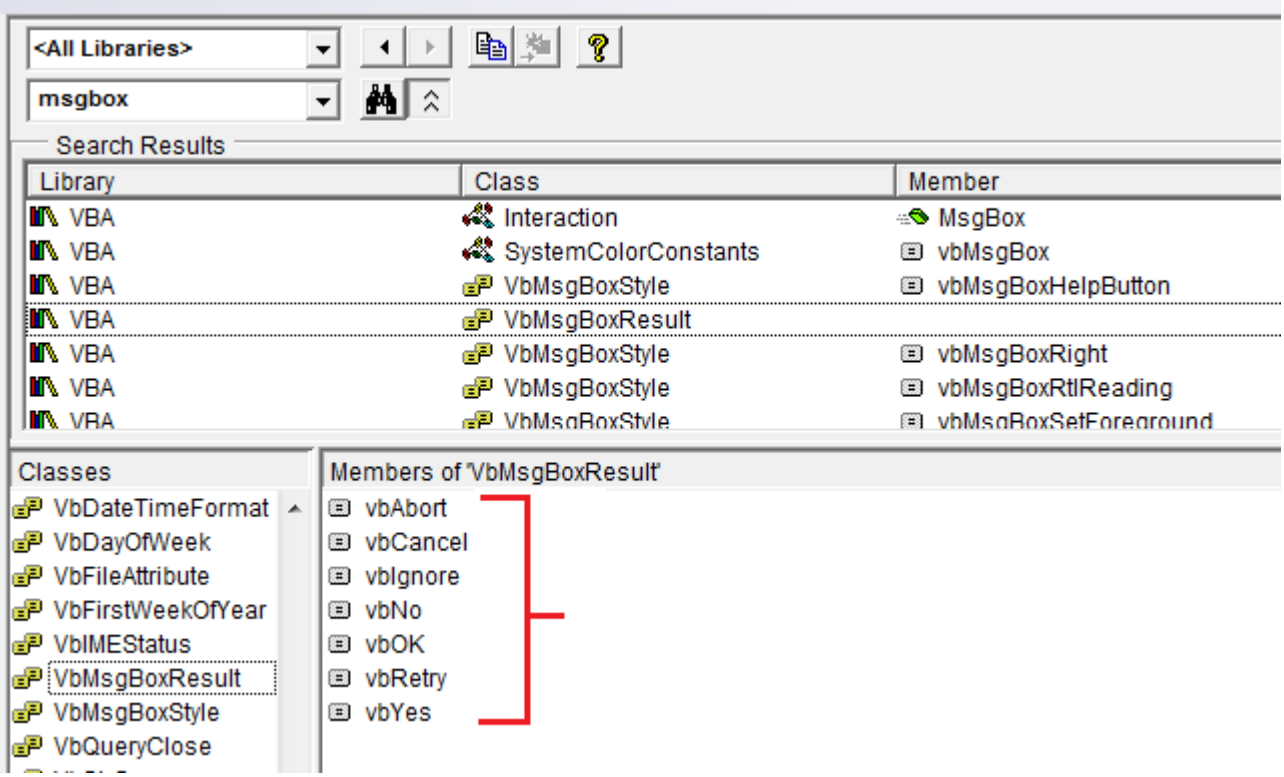
```
If MsgBox("Click OK") = vbOK Then
```

.

```
If MsgBox("Click OK") = 1 Then
```

VB . → VB F2 □□□□ .





.

```
Dim ductWidth  As Double
Dim ductHeight As Double
Dim ductArea   As Double

ductArea = ductWidth * ductHeight
```

~

```
Dim a, w, h

a = w * h
```

,, . .

```
Dim myWB As Workbook
Dim srcWS As Worksheet
Dim destWS As Worksheet
Dim srcData As Range
Dim destData As Range

Set myWB = ActiveWorkbook
Set srcWS = myWB.Sheets("Sheet1")
Set destWS = myWB.Sheets("Sheet2")
Set srcData = srcWS.Range("A1:A10")
Set destData = destWS.Range("B11:B20")
destData = srcData
```

.

```
Dim ductWidth As Double, ductHeight As Double, ductArea As Double
```

Variant .

```
Dim ductWidth, ductHeight, ductArea As Double
```

VBA .

VBA . .

```
On Error GoTo 0 'Avoid using
```

```
On Error Resume Next 'Avoid using
```

:

```
On Error GoTo <line> 'Prefer using
```

0

`On Error GoTo 0` . VBA `debug` . . .

`On Error Resume Next` VBA . . , Excel `On Error Resume Next` .

```
'In this example, we open an instance of Powerpoint using the On Error Resume Next call
Dim PPApp As PowerPoint.Application
Dim PPPres As PowerPoint.Presentation
Dim PPSlide As PowerPoint.Slide

'Open PPT if not running, otherwise select active instance
On Error Resume Next
Set PPApp = GetObject(, "PowerPoint.Application")
On Error GoTo ErrHandler
If PPApp Is Nothing Then
    'Open PowerPoint
    Set PPApp = CreateObject("PowerPoint.Application")
    PPApp.Visible = True
End If
```

`On Error Resume Next` Powerpoint `GetObject` . `On Error Resume Next` .

: `On Error Resume Next`

<line>

. VBA . . `On Error GoTo <line>` . `On Error GoTo <line>` .

: `Exit Sub` . .

```
Sub YourMethodName()
    On Error GoTo errorHandler
    ' Insert code here
    On Error GoTo secondErrorHandler

    Exit Sub 'The exit sub line is essential, as the code will otherwise
             'continue running into the error handling block, likely causing an error

errorHandler:
    MsgBox "Error " & Err.Number & ": " & Err.Description & " in " & _
        VBE.ActiveCodePane.CodeModule, vbOKOnly, "Error"
    Exit Sub

secondErrorHandler:
    If Err.Number = 424 Then 'Object not found error (purely for illustration)
        Application.ScreenUpdating = True
        Application.EnableEvents = True
        Exit Sub
    Else
        MsgBox "Error " & Err.Number & ": " & Err.Desctription
        Application.ScreenUpdating = True
        Application.EnableEvents = True
        Exit Sub
```

```
    End If
    Exit Sub

End Sub
```

.

- .
-
-
-
-
-
- End Sub
-

. .

```
Function Bonus(EmployeeTitle as String) as Double
    If EmployeeTitle = "Sales" Then
        Bonus = 0    'Sales representatives receive commission instead of a bonus
    Else
        Bonus = .10
    End If
End Function
```

. , :

```
Sub CopySalesNumbers
    Dim IncludeWeekends as Boolean

    'Boolean values can be evaluated as an integer, -1 for True, 0 for False.
    'This is used here to adjust the range from 5 to 7 rows if including weekends.
    Range("A1:A" & 5 - (IncludeWeekends * 2)).Copy
    Range("B1").PasteSpecial
End Sub
```

.

```
Sub CopySalesNumbers
    Dim IncludeWeekends as Boolean
    Dim DaysinWeek as Integer

    If IncludeWeekends Then
        DaysinWeek = 7
    Else
        DaysinWeek = 5
    End If
    Range("A1:A" & DaysinWeek).Copy
    Range("B1").PasteSpecial
End Sub
```

. . .

```
Public Sub SpeedUp( _
    SpeedUpOn As Boolean, _
    Optional xlCalc as XlCalculation = xlCalculationAutomatic _
)
    With Application
        If SpeedUpOn Then
            .ScreenUpdating = False
            .Calculation = xlCalculationManual
            .EnableEvents = False
            .DisplayStatusBar = False 'in case you are not showing any messages
            ActiveSheet.DisplayPageBreaks = False 'note this is a sheet-level setting
        Else
            .ScreenUpdating = True
            .Calculation = xlCalc
            .EnableEvents = True
            .DisplayStatusBar = True
            ActiveSheet.DisplayPageBreaks = True
        End If
    End With
End Sub
```

Office - Excel VBA

.

```
Public Sub SomeMacro
    'store the initial "calculation" state
    Dim xlCalc As XlCalculation
    xlCalc = Application.Calculation

    SpeedUp True

    'code here ...

    'by giving the second argument the initial "calculation" state is restored
    'otherwise it is set to 'xlCalculationAutomatic'
    SpeedUp False, xlCalc
End Sub
```

Public Sub " " Application.EnableEvents = False Worksheet_Change Workbook_SheetChange
. "" . '' .

```
Option Explicit

Private Sub Worksheet_Change(ByVal Target As Range)
    If Not Intersect(Target, Range("A:A")) Is Nothing Then
        On Error GoTo bm_Safe_Exit
        Application.EnableEvents = False

        'code that may change a value on the worksheet goes here

    End If
bm_Safe_Exit:
    Application.EnableEvents = True
End Sub
```

: . SpeedUp True .

xlCalculationManual xlCalculationManual .SpeedUp Application.Calculate .

: Application Application . (End Unload Me) .

:

```
Public Sub SomeMacro()
    'store the initial "calculation" state
    Dim xlCalc As XlCalculation
    xlCalc = Application.Calculation

    On Error GoTo Handler
    SpeedUp True

    'code here ...
    i = 1 / 0
CleanExit:
    SpeedUp False, xlCalc
    Exit Sub
Handler:
    'handle error
    Resume CleanExit
End Sub
```

Excel ActiveCell ActiveSheet .

ActiveCell ActiveSheet .

```
ActiveCell.Value = "Hello"
'will place "Hello" in the cell that is currently selected
Cells(1, 1).Value = "Hello"
'will always place "Hello" in A1 of the currently selected sheet

ActiveSheet.Cells(1, 1).Value = "Hello"
'will place "Hello" in A1 of the currently selected sheet
Sheets("MySheetName").Cells(1, 1).Value = "Hello"
'will always place "Hello" in A1 of the sheet named "MySheetName"
```

- Active* .
- .
- Sheets("MyOtherSheet").Select Sheets("MyOtherSheet").Select .

.

. Sub Function . .

, .- :

```
Option Explicit
Sub ShowTheTime()
    '--- displays the current time and date in cell A1 on the worksheet
    Cells(1, 1).Value = Now()  ' don't refer to Cells without a sheet reference!
End Sub
```

`Sheet1` `Sheet1` A1 . . .

.

```
Option Explicit
Sub ShowTheTime()
    '--- displays the current time and date in cell A1 on the worksheet
    Dim myWB As Workbook
    Set myWB = ThisWorkbook
    Dim timestampSH As Worksheet
    Set timestampSH = myWB.Sheets("Sheet1")
    timestampSH.Cells(1, 1).Value = Now()
End Sub
```

. , .

SELECT ACTIVATE

`Select Activate` Excel .

VBA . , Sheet2 D3 .

```
Option Explicit
Sub Macro1()
'
' Macro1 Macro
'

'
    Sheets("Sheet2").Select
    Range("D3").Select
    ActiveCell.FormulaR1C1 = "3.1415"   '(see **note below)
    Range("D4").Select
End Sub
```

() . `Sheets("Sheet2").Select` Sheet2) (`Sheets("Sheet2").Select`)) (`Range("D3").Select` D3 `Range("D3").Select`) `Range("D3").Select` Enter : `Range("D4").Select`).

. `.Select` :

- . .
- **`.Select()`** . `Application.ScreenUpdating False` .
- **`.Select()`** . `Application.ScreenUpdating True` Excel , . .
- **`.Select()`** . , `Worksheet_SelectionChange()` .

VBA , "" (: `Select`) . .

```
'--- GOOD
ActiveWorkbook.Sheets("Sheet2").Range("D3").Value = 3.1415

'--- BETTER
Dim myWB      As Workbook
Dim myWS      As Worksheet
Dim myCell    As Range
```

```
Set myWB = ThisWorkbook             '*** see NOTE2
Set myWS = myWB.Sheets("Sheet2")
Set myCell = myWS.Range("D3")

myCell.Value = 3.1415
```

(BETTER .GOOD .)

** : . . .

** NOTE2 : `ActiveWorkbook` `ThisWorkbook` ( ). VBA . Excel `ActiveWorkbook` *VBA* . . `ThisWorkbook` .

.

.

`ActiveWorkbook` `ActiveSheet` .

" *Data.xlsx* " " *Raw_Data* " " *Results.xlsx* " " *Refined_Data* " .

`Select` .

```
Option Explicit

Sub CopyRanges_BetweenShts()


    Dim wbSrc                           As Workbook
    Dim wbDest                          As Workbook
    Dim shtCopy                         As Worksheet
    Dim shtPaste                        As Worksheet

    ' set reference to all workbooks by name, don't rely on ActiveWorkbook
    Set wbSrc = Workbooks("Data.xlsx")
    Set wbDest = Workbooks("Results.xlsx")

    ' set reference to all sheets by name, don't rely on ActiveSheet
    Set shtCopy = wbSrc.Sheet1 '// "Raw_Data" sheet
    Set shtPaste = wbDest.Sheet2 '// "Refined_Data") sheet

    ' copy range from "Data" workbook to "Results" workbook without using Select
    shtCopy.Range("A1:C10").Copy _
    Destination:=shtPaste.Range("A1")

End Sub
```

WorksheetFunction UDF .

VBA .

SUM COUNTIF WorkSheetFunctions if .

() ( ) :

```
Sub UseRange()
    Dim rng as Range
    Dim Total As Double
    Dim CountLessThan01 As Long

    Total = 0
    CountLessThan01 = 0
    For Each rng in Sheets(1).Range("A1:A100")
        Total = Total + rng.Value2
        If rng.Value < 0.1 Then
            CountLessThan01 = CountLessThan01 + 1
        End If
    Next rng
    Debug.Print Total & ", " & CountLessThan01
End Sub
```

.

```
Sub UseArray()
    Dim DataToSummarize As Variant
    Dim i As Long
    Dim Total As Double
    Dim CountLessThan01 As Long

    DataToSummarize = Sheets(1).Range("A1:A100").Value2 'faster than .Value
    Total = 0
    CountLessThan01 = 0
    For i = 1 To 100
        Total = Total + DataToSummarize(i, 1)
        If DataToSummarize(i, 1) < 0.1 Then
            CountLessThan01 = CountLessThan01 + 1
        End If
    Next i
    Debug.Print Total & ", " & CountLessThan01
End Sub
```

`Application.Worksheetfunction` .

```
Sub UseWorksheetFunction()
    Dim Total As Double
    Dim CountLessThan01 As Long

    With Application.WorksheetFunction
        Total = .Sum(Sheets(1).Range("A1:A100"))
        CountLessThan01 = .CountIf(Sheets(1).Range("A1:A100"), "<0.1")
    End With

    Debug.Print Total & ", " & CountLessThan01
End Sub
```

`Application.Evaluate` .

```
Sub UseEvaluate()
    Dim Total As Double
    Dim CountLessThan01 As Long

    With Application
```

```
        Total = .Evaluate("SUM(" & Sheet1.Range("A1:A100").Address( _
            external:=True) & ")")
        CountLessThan01 = .Evaluate("COUNTIF('Sheet1'!A1:A100,""<0.1"")")
    End With

    Debug.Print Total & ", " & CountLessThan01
End Sub
```

Sub 25,000 (5) (PC).

1. UseWorksheetFunction : 2156ms
2. : 2219 ms (+ 3 %)
3. UseEvaluate : 4693 ms (+ 118 %)
4. : 6530ms (+ 203 %)

.

' ' .

- ( ) , Find / .

```
Option Explicit

Sub find()
    Dim row As Long, column As Long
    Dim find As String, address As Range

    find = "something"

    With ThisWorkbook.Worksheets("Sheet1").Cells
        Set address = .SpecialCells(xlCellTypeLastCell)
        row = .find(what:=find, after:=address).row        '< note .row not capitalized
        column = .find(what:=find, after:=address).column  '< note .column not capitalized

        Debug.Print "The first 'something' is in " & .Cells(row, column).address(0, 0)
    End With
End Sub
```

Good Form - .

```
Option Explicit

Sub myFind()
    Dim rw As Long, col As Long
    Dim wht As String, lastCell As Range

    wht = "something"

    With ThisWorkbook.Worksheets("Sheet1").Cells
        Set lastCell = .SpecialCells(xlCellTypeLastCell)
        rw = .Find(What:=wht, After:=lastCell).Row         '◂ note .Find and .Row
        col = .Find(What:=wht, After:=lastCell).Column     '◂ .Find and .Column

        Debug.Print "The first 'something' is in " & .Cells(rw, col).Address(0, 0)
    End With
End Sub
```

. , .

VBA : https://riptutorial.com/ko/excel-vba/topic/1107/vba--

6: VBA

Examples

VBA

VBA (:) . VBA .

:

1. Visual Basic Editor (Alt + F11).
2. -> VBAProject Properties ... .
3. .
4. " " .
5. .

Office . VBA .

VBA : https://riptutorial.com/ko/excel-vba/topic/7642/vba-

7: VBA

3 . Modify Delete .

Examples

FormatConditions.Add

:

```
FormatConditions.Add(Type, Operator, Formula1, Formula2)
```

:

	/	
		XlFormatConditionType
1		
2		

XlFormatConditionType enumaration :

xlAboveAverageCondition	
xlBlanksCondition	
xlCellValue	
xlColorScale	
xl	Databar
xlErrorsCondition	
xl	
XlIconSet	.
xlNoBlanksCondition	

xlNoErrorsCondition	
xlTextString	
xl	
xlTop10	10
xl	

:

```
With Range("A1").FormatConditions.Add(xlCellValue, xlGreater, "=100")
    With .Font
        .Bold = True
        .ColorIndex = 3
     End With
End With
```

:

xlBetween
xlEqual
xlGreater
xlGreaterEqual
xlLess
xlLessEqual
xlNotBetween
xlNotEqual

Type xlExpression Operator .

```
With Range("a1:a10").FormatConditions.Add(xlTextString, TextOperator:=xlContains,
String:="egg")
    With .Font
        .Bold = True
```

```
        .ColorIndex = 3
    End With
End With
```

:

xlBeginsWith	.
xl	.
xlDoesNotContain	.
xlEndsWith	

```
With Range("a1:a10").FormatConditions.Add(xlTimePeriod, DateOperator:=xlToday)
    With .Font
        .Bold = True
        .ColorIndex = 3
    End With
End With
```

:

xlLast7Days
xlLastWeek
xl
xlNextWeek
xlLastMonth
xlThisMonth
xlNextMonth

:

```
Range("A1:A10").FormatConditions.Delete
```

:

```
Cells.FormatConditions.Delete
```

FormatConditions.AddUniqueValues

```
With Range("E1:E100").FormatConditions.AddUniqueValues
   .DupeUnique = xlDuplicate
   With .Font
       .Bold = True
       .ColorIndex = 3
   End With
End With
```

```
With Range("E1:E100").FormatConditions.AddUniqueValues
   With .Font
       .Bold = True
       .ColorIndex = 3
   End With
End With
```

FormatConditions.AddTop10

5

```
With Range("E1:E100").FormatConditions.AddTop10
    .TopBottom = xlTop10Top
    .Rank = 5
    .Percent = False
    With .Font
        .Bold = True
        .ColorIndex = 3
    End With
End With
```

FormatConditions.AddAboveAverage

```
With Range("E1:E100").FormatConditions.AddAboveAverage
    .AboveBelow = xlAboveAverage
    With .Font
        .Bold = True
        .ColorIndex = 3
    End With
End With
```

:

XlAboveAverage	
XlAboveStdDev	
XlBelowAverage	
XlBelowStdDev	
XlEqualAboveAverage	
XlEqualBelowAverage	

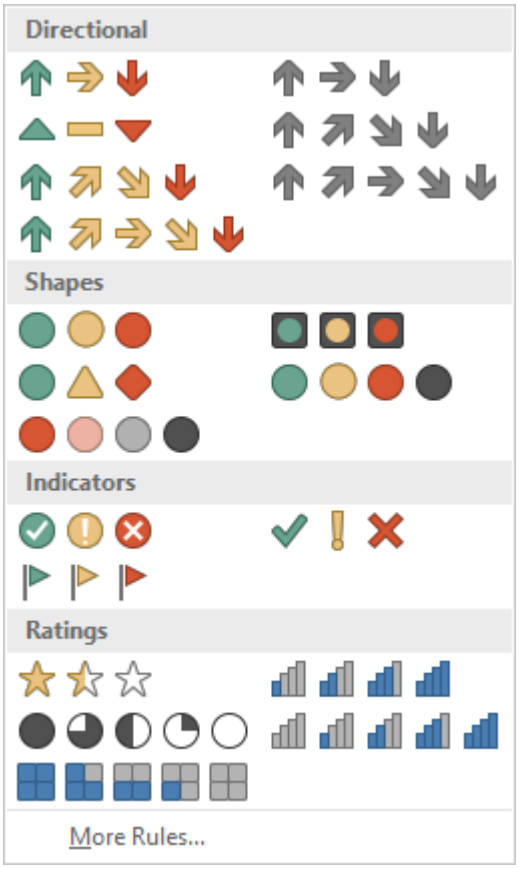
FormatConditions.AddIconSetCondition

	A
1	13
2	22
3	33
4	30
5	23
6	40
7	50
8	4
9	20
10	13
11	5
12	45
13	30
14	37
15	12

```
Range("a1:a10").FormatConditions.AddIconSetCondition
With Selection.FormatConditions(1)
    .ReverseOrder = False
    .ShowIconOnly = False
    .IconSet = ActiveWorkbook.IconSets(xl3Arrows)
End With

With Selection.FormatConditions(1).IconCriteria(2)
    .Type = xlConditionValuePercent
    .Value = 33
    .Operator = 7
End With

With Selection.FormatConditions(1).IconCriteria(3)
    .Type = xlConditionValuePercent
    .Value = 67
    .Operator = 7
End With
```

IconSet :

xl3Arrows
xl3ArrowsGray
xl3
xl3
xl3Stars
xl3
xl3 2
xl3TrafficLights1
xl3TrafficLights2
xl3
xl4Arrows
xl4ArrowsGray
xl4CRV
xl4RedToBlack
xl4
xl5Arrows
xl5ArrowsGray
xl5Boxes
xl5CRV
xl5



:

xlConditionValuePercent
xlConditionValueNumber
xlConditionValuePercentile
xlConditionValueFormula

:

xlGreater	5
xlGreaterEqual	7

:

.

VBA : https://riptutorial.com/ko/excel-vba/topic/9912/vba----

8: VBA PowerPoint

VBA PowerPoint . PowerPoint Excel . VBA .

Examples

: VBA PowerPoint

PowerPoint .

: PowerPoint VBA . References Documentation .

, . .

```
Dim PPApp As PowerPoint.Application
Dim PPPres As PowerPoint.Presentation
Dim PPSlide As PowerPoint.Slide
```

PowerPoint . `On Error Resume Next` PowerPoint `GetObject` . .

```
'Open PPT if not running, otherwise select active instance
On Error Resume Next
Set PPApp = GetObject(, "PowerPoint.Application")
On Error GoTo ErrHandler
If PPApp Is Nothing Then
    'Open PowerPoint
    Set PPApp = CreateObject("PowerPoint.Application")
    PPApp.Visible = True
End If
```

.

```
'Generate new Presentation and slide for graphic creation
Set PPPres = PPApp.Presentations.Add
Set PPSlide = PPPres.Slides.Add(1, ppLayoutBlank)

'Here, the slide type is set to the 4:3 shape with slide numbers enabled and the window
'maximized on the screen.  These properties can, of course, be altered as needed

PPApp.ActiveWindow.ViewType = ppViewSlide
PPPres.PageSetup.SlideOrientation = msoOrientationHorizontal
PPPres.PageSetup.SlideSize = ppSlideSizeOnScreen
PPPres.SlideMaster.HeadersFooters.SlideNumber.Visible = msoTrue
PPApp.ActiveWindow.WindowState = ppWindowMaximized
```

PowerPoint . , , .

VBA PowerPoint : https://riptutorial.com/ko/excel-vba/topic/2327/vba--powerpoint-

9: VBA Excel

VBA Excel . VBA Excel ListObject . ListObject ListRow (s), ListColumn (s), DataBodyRange, Range HeaderRowRange.

Examples

ListObject

```
Dim lo as ListObject
Dim MyRange as Range

Set lo = Sheet1.ListObjects(1)

'or

Set lo = Sheet1.ListObjects("Table1")

'or

Set lo = MyRange.ListObject
```

ListRows / ListColumns

```
Dim lo as ListObject
Dim lr as ListRow
Dim lc as ListColumn

Set lr = lo.ListRows.Add
Set lr = lo.ListRows(5)

For Each lr in lo.ListRows
    lr.Range.ClearContents
    lr.Range(1, lo.ListColumns("Some Column").Index).Value = 8
Next

Set lc = lo.ListColumns.Add
Set lc = lo.ListColumns(4)
Set lc = lo.ListColumns("Header 3")

For Each lc in lo.ListColumns
    lc.DataBodyRange.ClearContents   'DataBodyRange excludes the header row
    lc.Range(1,1).Value = "New Header Name"    'Range includes the header row
Next
```

Excel

```
Dim lo as ListObject

Set lo = Sheet1.ListObjects("Table1")
lo.Unlist
```

VBA Excel : https://riptutorial.com/ko/excel-vba/topic/9753/vba-excel--

10:

- Debug.Print (string)
- () /

Examples

Debug.Print

`Debug.Print .`

```
Private Sub ListErrCodes()
    Debug.Print "List Error Code Descriptions"
    For i = 0 To 65535
        e = Error(i)
        If e <> "Application-defined or object-defined error" Then Debug.Print i & ": " & e
    Next i
End Sub
```

.

- | **V** iew muitly Window
- **Ctrl-G**

Stop . .

```
Sub Test()
    Dim TestVar as String
    TestVar = "Hello World"
    Stop                    'Sub will be executed to this point and then wait for the user
    MsgBox TestVar
End Sub
```

`ENTER ENTER .`

`?  . print  print .`

Visual Basic Editor `CTRL + G` . "ExampleSheet" `ENTER`

```
   ActiveSheet.Name = "ExampleSheet"
```

```
? ActiveSheet.Name
ExampleSheet
```

. .

```
'In this example, the Immediate Window was used to confirm that a series of Left and Right
'string methods would return the desired string
```

```
'expected output: "value"
print Left(Right("1111value1111",9),5) ' <---- written code here, ENTER pressed
value                                  ' <---- output
```

, . `True` `Application.EnableEvents = False` (. .

```
? Application.EnableEvents       ' <---- Testing the current state of "EnableEvents"
False                            ' <---- Output
Application.EnableEvents = True  ' <---- Resetting the property value to True
? Application.EnableEvents       ' <---- Testing the current state of "EnableEvents"
True                             ' <---- Output
```

: . .

```
x = Split("a,b,c",","): For i = LBound(x,1) to UBound(x,1): Debug.Print x(i): Next i '<----
Input this and press enter
a '<----Output
b '<----Output
c '<----Output
```

. `Timer` VBA Windows PC 1/126 (3.90625) () . VBA `Now` `Time` .

```
Dim start As Double       ' Timer returns Single, but converting to Double to avoid
start = Timer             ' scientific notation like 3.90625E-03 in the Immediate window
' ... part of the code
Debug.Print Timer - start; "seconds in part 1"

start = Timer
' ... another part of the code
Debug.Print Timer - start; "seconds in part 2"
```

VBA . .

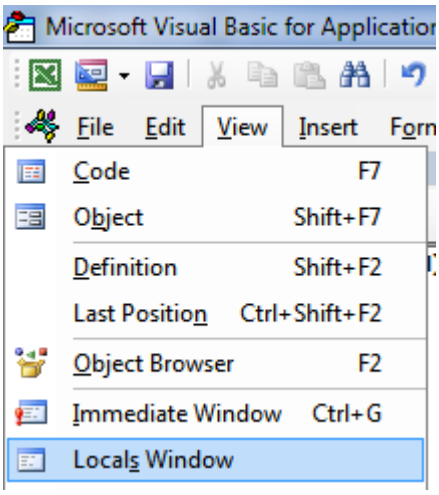
"" . .

. . .

.

```
Option Explicit
Sub LocalsWindowExample()
    Dim findMeInLocals As Integer
    Dim findMEInLocals2 As Range

    findMeInLocals = 1
    Set findMEInLocals2 = ActiveWorkbook.Sheets(1).Range("A1")
End Sub
```

VBA -> .



F8 findMeinLocals . 0 . . 'Nothing'.

```
Option Explicit
Sub LocalsWindowExample()
    Dim findMeInLocals As Integer
    Dim findMEInLocals2 As Range

    findMeInLocals = 1
    Set findMEInLocals2 = ActiveWorkbook.Sheets(1).Range("A1")
End Sub
```

Locals

VBAProject.Sheet1.LocalsWindowExample

Expression	Value	Typ
Me		Shee
findMeInLocals	0	Integ
findMEInLocals2	Nothing	Rang

.

```
Option Explicit
Sub LocalsWindowExample()
    Dim findMeInLocals As Integer
    Dim findMEInLocals2 As Range

    findMeInLocals = 1
    Set findMEInLocals2 = ActiveWorkbook.Sheets(1).Range("A1")
End Sub
```

findMeInLocals 1 Integer , FindMeInLocals2 / . + .

Locals

VBAProject.Sheet1.LocalsWindowExample

Expression	Value	Typ
Me		Shee
findMeInLocals	1	Integ
findMEInLocals2		Rang
AddIndent	False	Vari
AllowEdit	True	Bool
Application		Appl
Areas		Area
Borders		Bord
Cells		Rang
Column	1	Long
ColumnWidth	8.43	Vari
Comment	Nothing	Com
Count	1	Long
CountLarge	1	Vari
Creator	xlCreatorCode	XlCr
CurrentArray	<No cells were found.>	Rang
CurrentRegion		Rang
Dependents	<No cells were found.>	Rang
DirectDependents	<No cells were found.>	Rang
DirectPrecedents	<No cells were found.>	Rang
DisplayFormat		Displ

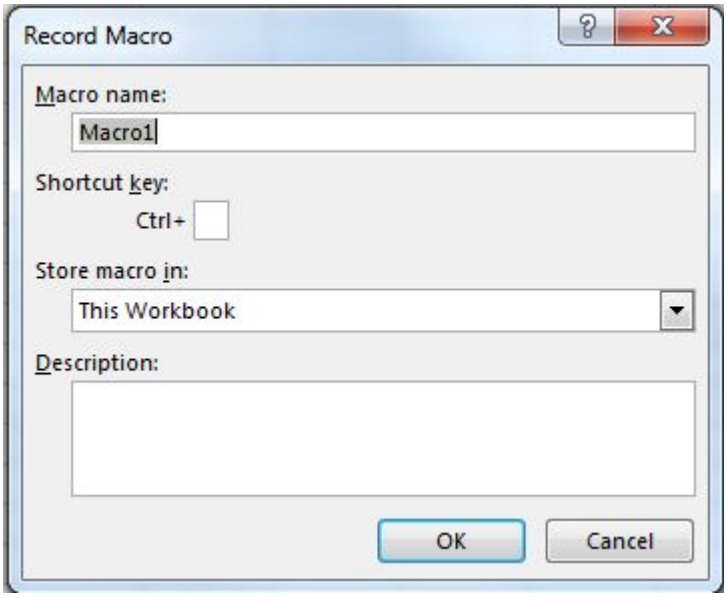
: https://riptutorial.com/ko/excel-vba/topic/861/---

11:

Examples

Excel . 

. . .



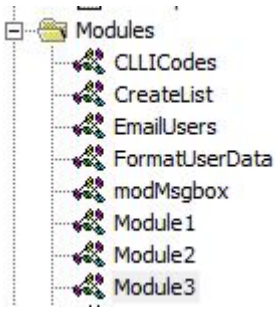
.

" ", " " " " . " " . " " . " " .

"" .

. . .

Visual Basic . (Alt + F11)

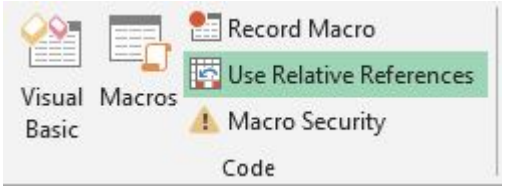


.

. .

.

```
Sub Macro1()
'
' Macro1 Macro
'

'
    Selection.Copy
    Range("A12").Select
    ActiveSheet.Paste
End Sub
```

"A12" " " . 

.

```
Sub Macro2()
'
' Macro2 Macro
'

'
    Selection.Copy
    ActiveCell.Offset(11, 0).Range("A1").Select
    ActiveSheet.Paste
End Sub
```

"A1" 11 , 11 .

: https://riptutorial.com/ko/excel-vba/topic/8204/--

12:

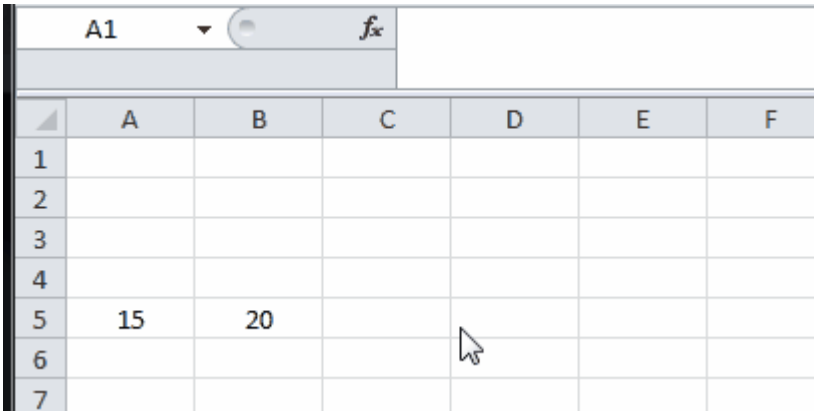
, , Excel .

Examples

.

`=A5*B5` `=Width*Height` .

.



: . Excel . . .

VBA

`A1` 'MyRange'

```
ThisWorkbook.Names.Add Name:="MyRange", _
    RefersTo:=Worksheets("Sheet1").Range("A1")
```

```
ThisWorkbook.Names("MyRange").Delete
```

```
Dim rng As Range
Set rng = ThisWorkbook.Worksheets("Sheet1").Range("MyRange")
Call MsgBox("Width = " & rng.Value)
```

`Range` . .

```
Call MsgBox("Width = " & [MyRange])
```

: Range Value `[MyRange]` `[MyRange].Value`

. MyRange .

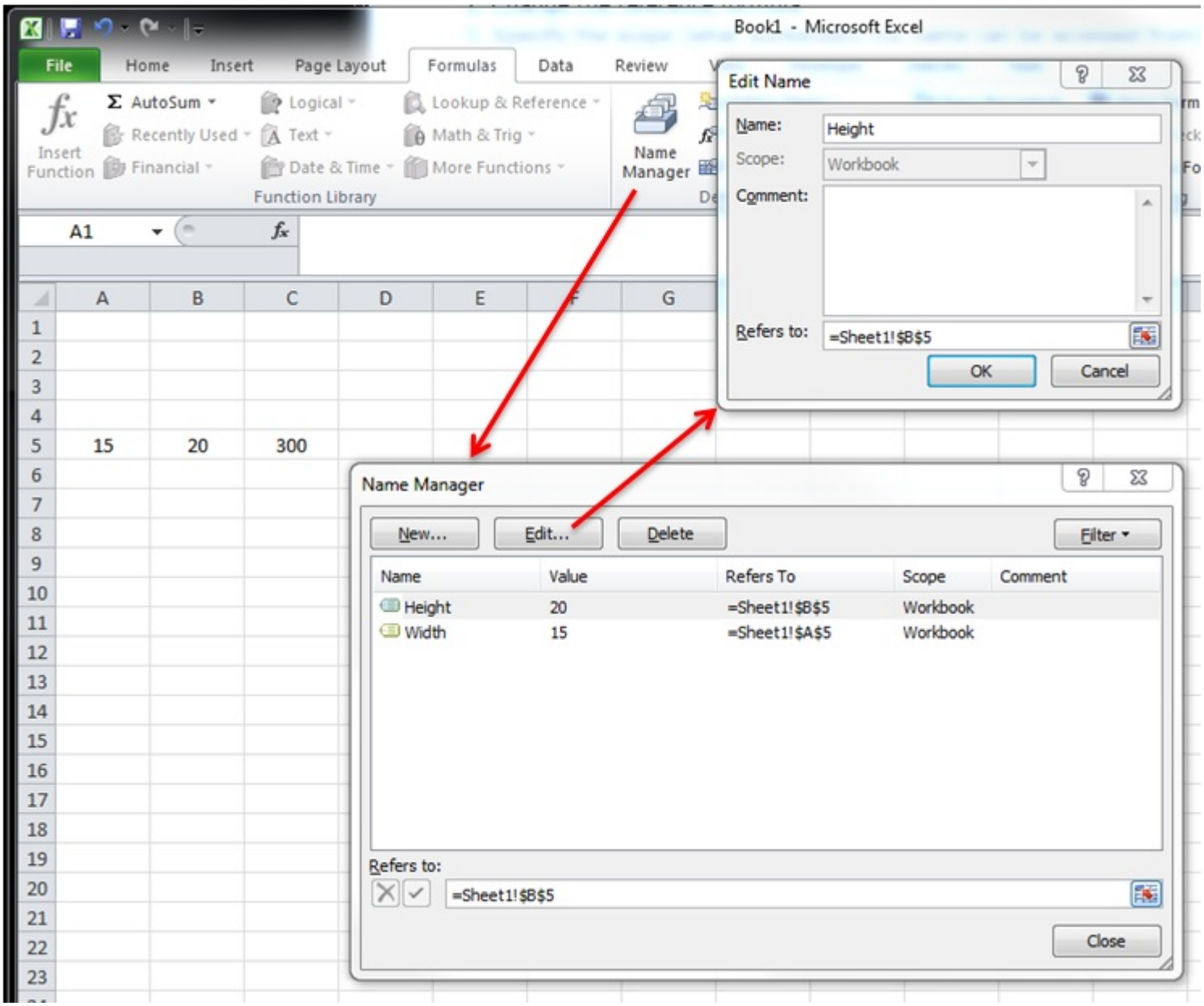
```
[MyRange].Select
```

: VBA . Width [Width] ThisWorkbook.Worksheets("Sheet1").Range("Width") ThisWorkbook.Worksheets("Sheet1").Range("Width")

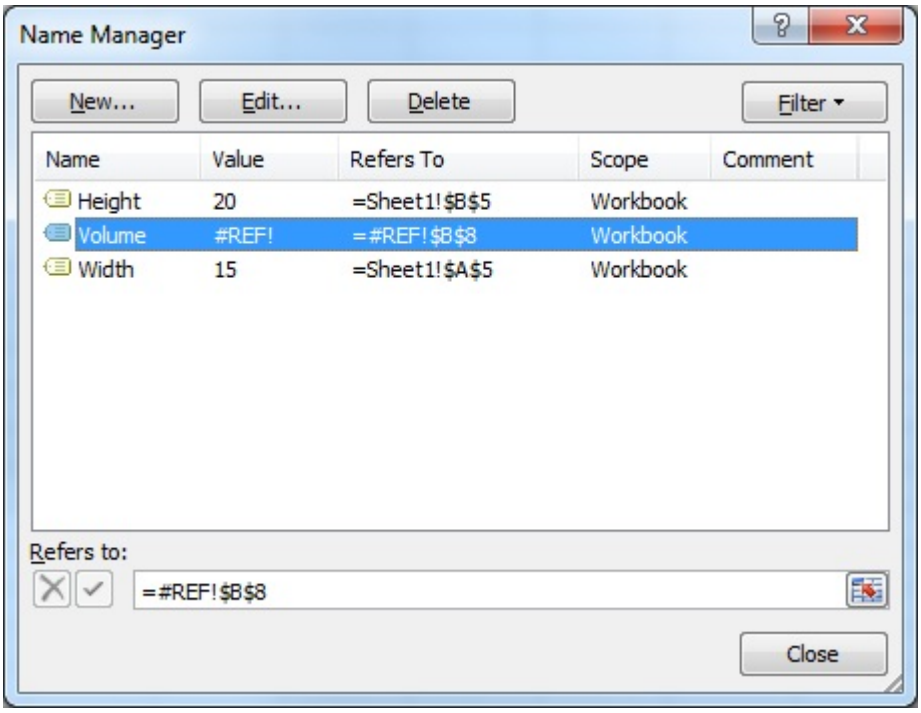
> >

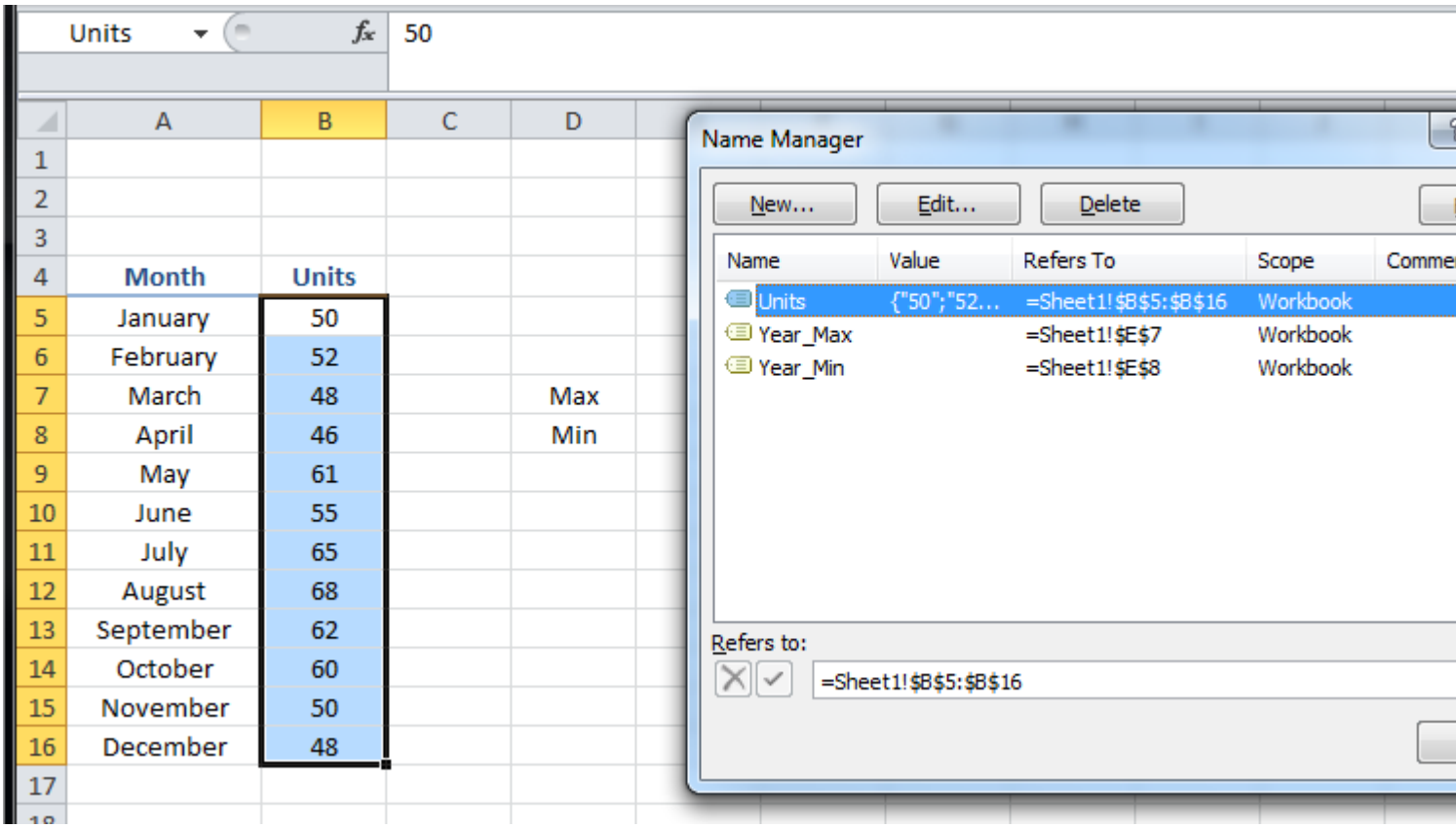
.

1.
2.
3.
4.



.






```
Sub Example()
    Dim wks As Worksheet
    Set wks = ThisWorkbook.Worksheets("Sheet1")

    Dim units As Range
    Set units = ThisWorkbook.Names("Units").RefersToRange

    Worksheets("Sheet1").Range("Year_Max").Value = WorksheetFunction.Max(units)
    Worksheets("Sheet1").Range("Year_Min").Value = WorksheetFunction.Min(units)
End Sub
```

Month	Units			
January	50			
February	52			
March	48		Max	68
April	46		Min	46
May	61			
June	55			
July	65			
August	68			
September	62			
October	60			
November	50			
December	48			

: https://riptutorial.com/ko/excel-vba/topic/8360/--

13:

Examples

( )

.

```
'one-dimensional
Dim arrayDirect1D(2) As String
arrayDirect(0) = "A"
arrayDirect(1) = "B"
arrayDirect(2) = "C"

'multi-dimensional (in this case 3D)
Dim arrayDirectMulti(1, 1, 2)
arrayDirectMulti(0, 0, 0) = "A"
arrayDirectMulti(0, 0, 1) = "B"
arrayDirectMulti(0, 0, 2) = "C"
arrayDirectMulti(0, 1, 0) = "D"
'...
```

Array ()

```
'one-dimensional only
Dim array1D As Variant 'has to be type variant
array1D = Array(1, 2, "A")
'-> array1D(0) = 1, array1D(1) = 2, array1D(2) = "A"
```

```
Dim arrayRange As Variant 'has to be type variant

'putting ranges in an array always creates a 2D array (even if only 1 row or column)
'starting at 1 and not 0, first dimension is the row and the second the column
arrayRange = Range("A1:C10").Value
'-> arrayRange(1,1) = value in A1
'-> arrayRange(1,2) = value in B1
'-> arrayRange(5,3) = value in C5
'...

'Yoo can get an one-dimensional array from a range (row or column)
'by using the worksheet functions index and transpose:

'one row from range into 1D-Array:
arrayRange = Application.WorksheetFunction.Index(Range("A1:C10").Value, 3, 0)
'-> row 3 of range into 1D-Array
'-> arrayRange(1) = value in A3, arrayRange(2) = value in B3, arrayRange(3) = value in C3

'one column into 1D-Array:
```

```
'limited to 65536 rows in the column, reason: limit of .Transpose
arrayRange = Application.WorksheetFunction.Index( _
Application.WorksheetFunction.Transpose(Range("A1:C10").Value), 2, 0)
'-> column 2 of range into 1D-Array
'-> arrayRange(1) = value in B1, arrayRange(2) = value in B2, arrayRange(3) = value in B3
'...

'By using Evaluate() - shorthand [] - you can transfer the
'range to an array and change the values at the same time.
'This is equivalent to an array formula in the sheet:
arrayRange = [(A1:C10*3)]
arrayRange = [(A1:C10&"_test")]
arrayRange = [(A1:B10*C1:C10)]
'...
```

Evaluate () 2D

```
Dim array2D As Variant
'[] ist a shorthand for evaluate()
'Arrays defined with evaluate start at 1 not 0
array2D = [{"1A","1B","1C";"2A","2B","3B"}]
'-> array2D(1,1) = "1A", array2D(1,2) = "1B", array2D(2,1) = "2A" ...

'if you want to use a string to fill the 2D-Array:
Dim strValues As String
strValues = "{""1A"","1B"","1C"";""2A"","2B"","2C""}"
array2D = Evaluate(strValues)
```

Split ()

```
Dim arraySplit As Variant 'has to be type variant
arraySplit = Split("a,b,c", ",")
'-> arraySplit(0) = "a", arraySplit(1) = "b", arraySplit(2) = "c"
```

( )

Excel-VBA VBA .

: ( )

( )

Excel-VBA VBA .

: ( )

( ).

Array . :

```
Dim myArray() As Integer
For i = 0 To UBound(myArray) 'Will result in a "Subscript Out of Range" error
```

.

```
If Not Not myArray Then MsgBox UBound(myArray) Else MsgBox "myArray not initialised"
```

[,]

```
Sub Array_clarity()

Dim arr() As Variant  'creates an empty array
Dim x As Long
Dim y As Long

x = Range("A1", Range("A1").End(xlDown)).Cells.Count
y = Range("A1", Range("A1").End(xlToRight)).Cells.Count

ReDim arr(0 To x, 0 To y) 'fixing the size of the array

For x = LBound(arr, 1) To UBound(arr, 1)
    For y = LBound(arr, 2) To UBound(arr, 2)
        arr(x, y) = Range("A1").Offset(x, y) 'storing the value of Range("A1:E10") from
activesheet in x and y variables
    Next
Next

'Put it on the same sheet according to the declaration:
Range("A14").Resize(UBound(arr, 1), UBound(arr, 2)).Value = arr

End Sub
```

: https://riptutorial.com/ko/excel-vba/topic/2027/

14:

- **Set** - Range .
- **For Each** - .

`r` , `cell` .

Examples

Range .

```
Sub RangeTest()
    Dim s As String
    Dim r As Range 'Specific Type of Object, with members like Address, WrapText, AutoFill,
etc.

    ' This is how we fill a String:
    s = "Hello World!"

    ' But we cannot do this for a Range:
    r = Range("A1") '//Run. Err.:  91 Object variable or With block variable not set//

    ' We have to use the Object approach, using keyword Set:
    Set r = Range("A1")
End Sub
```

.
MSDN (:) . MSDN Set .

.

```
Sub SetRangeVariable()
    Dim ws As Worksheet
    Dim r As Range

    Set ws = ThisWorkbook.Worksheets(1) ' The first Worksheet in Workbook with this code in it

    ' These are all equivalent:
    Set r = ws.Range("A2")
    Set r = ws.Range("A" & 2)
    Set r = ws.Cells(2, 1) ' The cell in row number 2, column number 1
    Set r = ws.[A2] 'Shorthand notation of Range.
    Set r = Range("NamedRangeInA2") 'If the cell A2 is named NamedRangeInA2. Note, that this
is Sheet independent.
    Set r = ws.Range("A1").Offset(1, 0) ' The cell that is 1 row and 0 columns away from A1
    Set r = ws.Range("A1").Cells(2,1) ' Similar to Offset. You can "go outside" the original
Range.

    Set r = ws.Range("A1:A5").Cells(2) 'Second cell in bigger Range.
    Set r = ws.Range("A1:A5").Item(2) 'Second cell in bigger Range.
    Set r = ws.Range("A1:A5")(2) 'Second cell in bigger Range.
End Sub
```

Cells (2, 1) Range ("A2") . Cell Range .
: Pearson ; MSDN ; John Walkenback- VBA .

Range ("A"& 2) / . :

```
Sub RangeIteration()
    Dim wb As Workbook, ws As Worksheet
    Dim r As Range

    Set wb = ThisWorkbook
    Set ws = wb.Worksheets(1)

    For i = 1 To 10
        Set r = ws.Range("A" & i)
        ' When i = 1, the result will be Range("A1")
        ' When i = 2, the result will be Range("A2")
        ' etc.
        ' Proof:
        Debug.Print r.Address
    Next i
End Sub
```

.

```
Sub RangeIteration2()
    Dim wb As Workbook, ws As Worksheet
    Dim r As Range

    Set wb = ThisWorkbook
    Set ws = wb.Worksheets(1)

    For i = 1 To 10
        For j = 1 To 10
            Set r = ws.Cells(i, j)
            ' When i = 1 and j = 1, the result will be Range("A1")
            ' When i = 2 and j = 1, the result will be Range("A2")
            ' When i = 1 and j = 2, the result will be Range("B1")
            ' etc.
            ' Proof:
            Debug.Print r.Address
        Next j
    Next i
End Sub
```

Excel A1 .

```
[a3] = "Hello!"
```

Application Evaluate .

```
Application.Evaluate("a3") = "Hello!"
```

Cells .

```
Cells(3, 1).Formula = "=A1+A2"
```

VBA Excel , A1 .

Excel ( ) . .

```
ActiveSheet.Cells(3, 1).Formula = "=SUM(A1:A2)"
```

.

```
Sheets("Sheet2").Cells(3, 1).Formula = "=SUM(A1:A2)"
```

. Rows Cells C1 .

```
ActiveSheet.Rows(1).Cells(3).Formula = "hi!"
```

Set . .

```
Dim R as Range
Set R = ActiveSheet.Cells(3, 1)
```

...

```
R.Font.Color = RGB(255, 0, 0)
```

Set ? Set Visual Basic = .

- **Offset (Rows, Columns) -** . . . .

```
Private Sub this()
    ThisWorkbook.Sheets("Sheet1").Range("A1").Offset(1, 1).Select
    ThisWorkbook.Sheets("Sheet1").Range("A1").Offset(1, 1).Value = "New Value"
    ActiveCell.Offset(-1, -1).Value = ActiveCell.Value
    ActiveCell.Value = vbNullString
End Sub
```

B2 A1 B2 .

( )

```
Sub TransposeRangeValues()
    Dim TmpArray() As Variant, FromRange as Range, ToRange as Range

    set FromRange = Sheets("Sheet1").Range("a1:a12")         'Worksheets(1).Range("a1:p1")
    set ToRange = ThisWorkbook.Sheets("Sheet1").Range("a1")
'ThisWorkbook.Sheets("Sheet1").Range("a1")

    TmpArray = Application.Transpose(FromRange.Value)
    FromRange.Clear
    ToRange.Resize(FromRange.Columns.Count,FromRange.Rows.Count).Value2 = TmpArray
End Sub
```

: Copy / PasteSpecial .

: https://riptutorial.com/ko/excel-vba/topic/1503/--

15:

. VBA . for-next if-then .

Examples

A2 A7 . : . xml .

```
    Sub find_duplicates()
' Declare variables
  Dim ws     As Worksheet                 ' worksheet
  Dim cell   As Range                     ' cell within worksheet range
  Dim n      As Integer                   ' highest row number
  Dim bFound As Boolean                   ' boolean flag, if duplicate is found
  Dim sFound As String: sFound = "|"      ' found duplicates
  Dim s      As String                    ' message string
  Dim s2     As String                    ' partial message string
' Set Sheet to memory
  Set ws = ThisWorkbook.Sheets("Duplicates")

' loop thru FULLY QUALIFIED REFERENCE
  For Each cell In ws.Range("A2:A7")
    bFound = False: s2 = ""               ' start each cell with empty values
 '  Check if first occurrence of this value as duplicate to avoid further searches
    If InStr(sFound, "|" & cell & "|") = 0 Then

      For n = cell.Row + 1 To 7            ' iterate starting point to avoid REDUNDANT SEARCH
        If cell = ws.Range("A" & n).Value Then
           If cell.Row <> n Then          ' only other cells, as same cell cannot be a duplicate
                 bFound = True              ' boolean flag
              '  found duplicates in cell A{n}
                 s2 = s2 & vbNewLine & " -> duplicate in A" & n
           End If
        End If
       Next
     End If
   ' notice all found duplicates
     If bFound Then
         ' add value to list of all found duplicate values
         ' (could be easily split to an array for further analyze)
           sFound = sFound & cell & "|"
           s = s & cell.Address & " (value=" & cell & ")" & s2 & vbNewLine & vbNewLine
     End If
   Next
' Messagebox with final result
  MsgBox "Duplicate values are " & sFound & vbNewLine & vbNewLine & s, vbInformation, "Found
duplicates"
End Sub
```

. n True If . .

: https://riptutorial.com/ko/excel-vba/topic/8295/---

16: /

Examples

/ .

, .

!

Merged Range ?

.

Range !

. ! ;)

.

- .
- .

/ : https://riptutorial.com/ko/excel-vba/topic/7308/-----

17: (UDF)

1. **function functionName (argumentVariable as dataType, argumentVariable2 as dataType, argumentVariable3 as dataType) functionReturnDataType .**
   . . 0 , . ( ). .

2. **functionName = theVariableOrValueBeingReturned**
   `Return` . VBA . . . return .

3.
   . `Function` . VBE .

UDF (User Defined Function) . (ex : `=SUM(...)`) Sub . UDF .

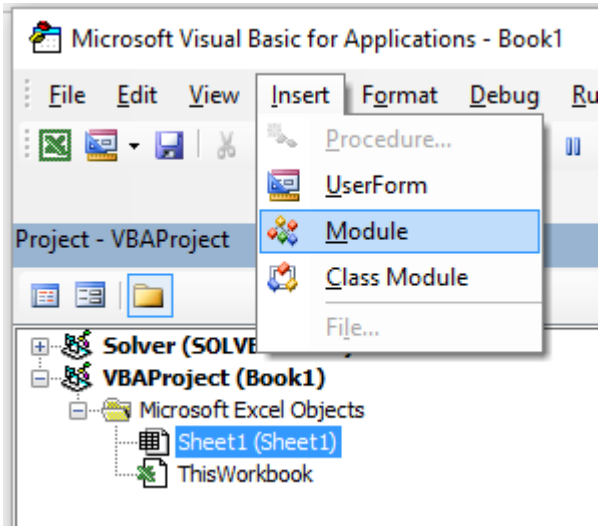
.

1. VBA .
2. Excel C API - Excel XLL .
3. COM .

Examples

UDF - Hello World

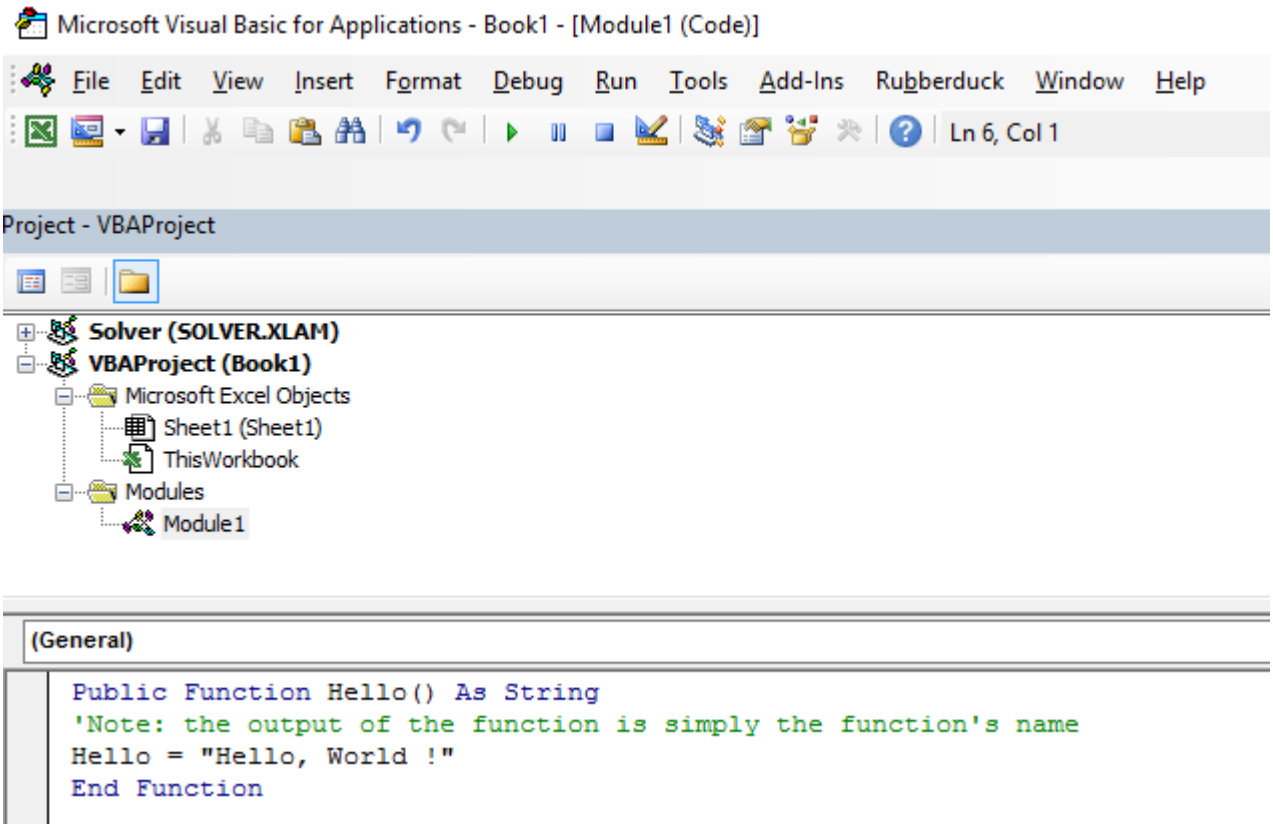
1. Excel
2. Visual Basic Editor (Visual Basic Editor).
3. -> .



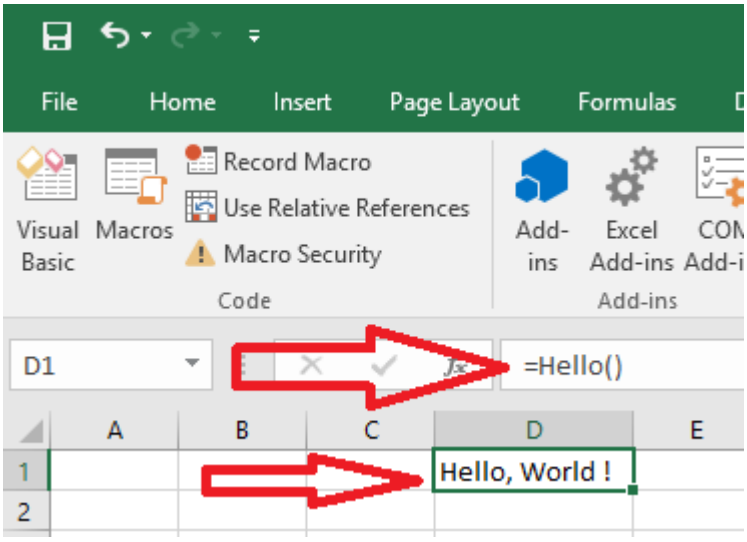
4. .

```
Public Function Hello() As String
'Note: the output of the function is simply the function's name
Hello = "Hello, World !"
End Function
```

:



5. "Hello World" "Hello ()" .



UDF . . VBA ( ) .

. .

Intersect Worksheet.UsedRange . _ *sum_range* _ *sum_range* SUMIF .

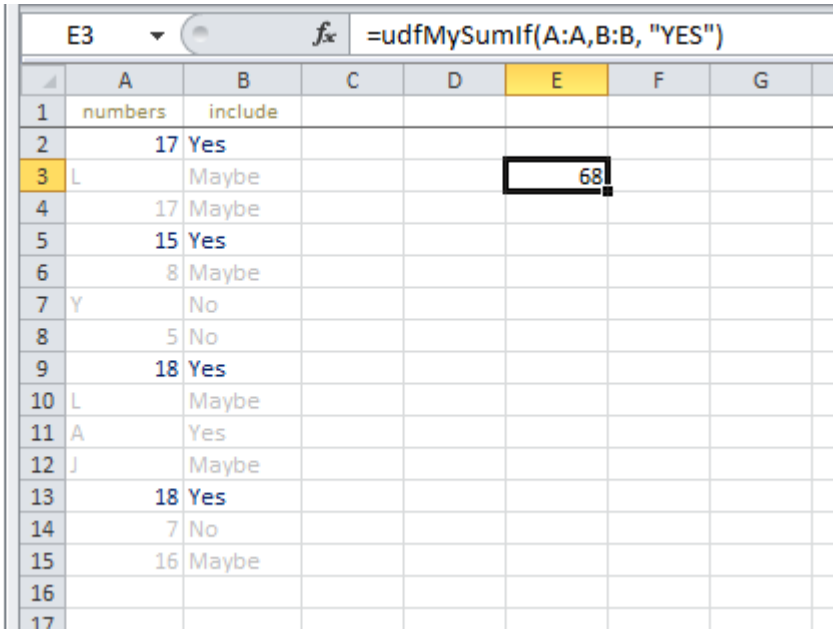
UDF Application.Caller . .Parent . .UsedRange .

:

```
Option Explicit

Function udfMySumIf(rngA As Range, rngB As Range, _
                    Optional crit As Variant = "yes")
    Dim c As Long, ttl As Double

    With Application.Caller.Parent
        Set rngA = Intersect(rngA, .UsedRange)
        Set rngB = rngB.Resize(rngA.Rows.Count, rngA.Columns.Count)
    End With

    For c = 1 To rngA.Cells.Count
        If IsNumeric(rngA.Cells(c).Value2) Then
            If LCase(rngB(c).Value2) = LCase(crit) Then
                ttl = ttl + rngA.Cells(c).Value2
            End If
        End If
    Next c

    udfMySumIf = ttl

End Function
```

:

```
=udfMySumIf(*sum_range*, *criteria_range*, [*criteria*])
```



2 (1,048,576) 15 .

Microsoft ™ MSDN .

```
Function countUnique(r As range) As Long
    'Application.Volatile False ' optional
    Set r = Intersect(r, r.Worksheet.UsedRange) ' optional if you pass entire rows or columns
to the function
    Dim c As New Collection, v
    On Error Resume Next   ' to ignore the Run-time error 457: "This key is already associated
with an element of this collection".
    For Each v In r.Value  ' remove .Value for ranges with more than one Areas
```

```
        c.Add 0, v & ""
    Next
    c.Remove "" ' optional to exclude blank values from the count
    countUnique = c.Count
End Function
```

(UDF) : https://riptutorial.com/ko/excel-vba/topic/1070/----udf-

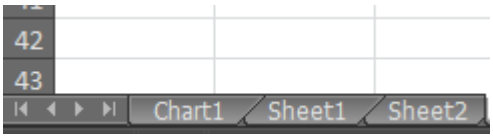
18:

VBA Worksheets Sheets . .

. Excel `Sheets` `Worksheets` .

Examples

.




```
Option Explicit

Sub CheckWorksheetsDiagram()

    Debug.Print Worksheets(1).Name
    Debug.Print Charts(1).Name
    Debug.Print Sheets(1).Name

End Sub
```

:

```
Sheet1
Chart1
Chart1
```

: https://riptutorial.com/ko/excel-vba/topic/9996/------

19: CustomDocumentProperties

CustomDocumentProperties (CDP) *).

: CDP BuiltInDocumentProperties .

*) " " .

Examples

. CustomDocumentProperties (CDP) .

:

" " (xlVeryHidden) (: ini , CSV) . .

:

- NextInvoiceNo,
- Invoice CDP DeleteInvoiceNo
- showAllCDPs CDPs . VBA VBA . [DropDown :] | |

(+ 1) . "InvoiceNo" CDP .

```
Dim sNumber As String
sNumber = NextInvoiceNo ()
```

:

```
Option Explicit

Sub Test()
  Dim sNumber As String
  sNumber = NextInvoiceNo()
  MsgBox "New Invoice No: " & sNumber, vbInformation, "New Invoice Number"
End Sub

Function NextInvoiceNo() As String
' Purpose: a) Set Custom Document Property (CDP) "InvoiceNo" if not yet existing
'          b) Increment CDP value and return new value as string
' Declarations
  Dim prop As Object
  Dim ret  As String
  Dim wb   As Workbook
' Set workbook and CDPs
  Set wb = ThisWorkbook
  Set prop = wb.CustomDocumentProperties

  ' -------------------------------------------------------
  ' Generate new CDP "InvoiceNo" if not yet existing
  ' -------------------------------------------------------
    If Not CDPExists("InvoiceNo") Then
```

```
    '  set temporary starting value "0"
       prop.Add "InvoiceNo", False, msoPropertyTypeString, "0"
    End If

  ' -------------------------------------------------------
  ' Increment invoice no and return function value as string
  ' -------------------------------------------------------
       ret = Format(Val(prop("InvoiceNo")) + 1, "0")
  ' a) Set CDP "InvoiceNo" = ret
       prop("InvoiceNo").value = ret
  ' b) Return function value
       NextInvoiceNo = ret
End Function

Private Function CDPExists(sCDPName As String) As Boolean
' Purpose: return True if custom document property (CDP) exists
' Method: loop thru CustomDocumentProperties collection and check if name parameter exists
' Site: cf. http://stackoverflow.com/questions/23917977/alternatives-to-public-variables-in-
vba/23918236#23918236
' vgl.: https://answers.microsoft.com/en-us/msoffice/forum/msoffice_word-mso_other/using-
customdocumentproperties-with-vba/91ef15eb-b089-4c9b-a8a7-1685d073fb9f
' Declarations
  Dim cdp As Variant      ' element of CustomDocumentProperties Collection
  Dim boo As Boolean      ' boolean value showing element exists
  For Each cdp In ThisWorkbook.CustomDocumentProperties
    If LCase(cdp.Name) = LCase(sCDPName) Then
       boo = True      ' heureka
       Exit For        ' exit loop
    End If
  Next
  CDPExists = boo          ' return value to function
End Function


Sub DeleteInvoiceNo()
' Declarations
  Dim wb     As Workbook
  Dim prop   As Object
' Set workbook and CDPs
  Set wb = ThisWorkbook
  Set prop = wb.CustomDocumentProperties

' ----------------------
' Delete CDP "InvoiceNo"
' ----------------------
 If CDPExists("InvoiceNo") Then
    prop("InvoiceNo").Delete
 End If
```

End Sub

```
Sub showAllCDPs()
' Purpose: Show all CustomDocumentProperties (CDP) and values (if set)
' Declarations
  Dim wb      As Workbook
  Dim cdp     As Object

  Dim i       As Integer
  Dim maxi   As Integer
  Dim s       As String
```

```
' Set workbook and CDPs
  Set wb = ThisWorkbook
  Set cdp = wb.CustomDocumentProperties
' Loop thru CDP getting name and value
  maxi = cdp.Count
  For i = 1 To maxi
    On Error Resume Next    ' necessary in case of unset value
    s = s & Chr(i + 96) & ") " & _
            cdp(i).Name & "=" & cdp(i).value & vbCr
  Next i
' Show result string
  Debug.Print s
End Sub
```

CustomDocumentProperties : https://riptutorial.com/ko/excel-vba/topic/10932/-customdocumentproperties

20:

: http://stackoverflow.com/a/11169920/4628637

Examples

.

.

End "" .

.

```
Sub FindingLastRow()
    Dim wS As Worksheet, LastRow As Long
    Set wS = ThisWorkbook.Worksheets("Sheet1")

    'Here we look in Column A
    LastRow = wS.Cells(wS.Rows.Count, "A").End(xlUp).Row
    Debug.Print LastRow
End Sub
```

.
`LastRow = wS.Cells(wS.Rows.Count, "A").End(xlUp).Row`

:

1. `"Sheet1"` :

   `LastRow = wS.UsedRange.Row - 1 + wS.UsedRange.Rows.Count` .

2. `"Sheet1"` `"A"` :

   ```
   Dim i As Long
   For i = LastRow To 1 Step -1
       If Not (IsEmpty(Cells(i, 1))) Then Exit For
   Next i
   LastRow = i
   ```

Sheet . .

```
Sub FindingLastRow()

Dim sht As Worksheet
Dim LastRow As Long
Dim FirstRow As Long

Set sht = ThisWorkbook.Worksheets("form")

'Using Named Range "MyNameRange"
FirstRow = sht.Range("MyNameRange").Row
```

```
' in case "MyNameRange" doesn't start at Row 1
LastRow = sht.Range("MyNameRange").Rows.count + FirstRow - 1

End Sub
```

:
@Jeeped . .
Asumptions : targes = `form` = `MyNameRange`

```
Sub FindingLastRow()
    Dim rw As Range, rwMax As Long
    For Each rw In Sheets("form").Range("MyNameRange").Rows
        If rw.Row > rwMax Then rwMax = rw.Row
    Next
    MsgBox "Last row of 'MyNameRange' under Sheets 'form': " & rwMax
End Sub
```

.

```
'if only one area (not multiple areas):
With Range("A3:D20")
    Debug.Print .Cells(.Cells.CountLarge).Row
    Debug.Print .Item(.Cells.CountLarge).Row 'using .item is also possible
End With 'Debug prints: 20

'with multiple areas (also works if only one area):
Dim rngArea As Range, LastRow As Long
With Range("A3:D20, E5:I50, H20:R35")
    For Each rngArea In .Areas
        If rngArea(rngArea.Cells.CountLarge).Row > LastRow Then
            LastRow = rngArea(rngArea.Cells.CountLarge).Row
        End If
    Next
    Debug.Print LastRow 'Debug prints: 50
End With
```

```
Private Sub Get_Last_Used_Row_Index()
    Dim wS As Worksheet

    Set wS = ThisWorkbook.Sheets("Sheet1")
    Debug.Print LastCol_1(wS)
    Debug.Print LastCol_0(wS)
End Sub
```

2 .

- : LastCol_1 : `wS.Cells(...,LastCol_1(wS))` .
- : Use LastCol_0 : 0

```
Public Function LastCol_1(wS As Worksheet) As Double
    With wS
        If Application.WorksheetFunction.CountA(.Cells) <> 0 Then
            LastCol_1 = .Cells.Find(What:="*", _
                                After:=.Range("A1"), _
```

```
                                Lookat:=xlPart, _
                                LookIn:=xlFormulas, _
                                SearchOrder:=xlByColumns, _
                                SearchDirection:=xlPrevious, _
                                MatchCase:=False).Column
        Else
            LastCol_1 = 1
        End If
    End With
End Function
```

Err 0 .

```
Public Function LastCol_0(wS As Worksheet) As Double
    On Error Resume Next
    LastCol_0 = wS.Cells.Find(What:="*", _
                            After:=ws.Range("A1"), _
                            Lookat:=xlPart, _
                            LookIn:=xlFormulas, _
                            SearchOrder:=xlByColumns, _
                            SearchDirection:=xlPrevious, _
                            MatchCase:=False).Column
End Function
```

Range.CurrentRegion

`Range.CurrentRegion` . ="" ' (`ISBLANK` Excel).

```
Dim rng As Range, lastCell As Range
Set rng = Range("C3").CurrentRegion       ' or Set rng = Sheet1.UsedRange.CurrentRegion
Set lastCell = rng(rng.Rows.Count, rng.Columns.Count)
```

```
Private Sub Get_Last_Used_Row_Index()
    Dim wS As Worksheet

    Set wS = ThisWorkbook.Sheets("Sheet1")
    Debug.Print LastRow_1(wS)
    Debug.Print LastRow_0(wS)
End Sub
```

2 .

- NO : LastRow_1 : `wS.Cells(LastRow_1(wS),...)` `wS.Cells(LastRow_1(wS),...)`
- : Use LastRow_0 : 0 .

```
Public Function LastRow_1(wS As Worksheet) As Double
    With wS
        If Application.WorksheetFunction.CountA(.Cells) <> 0 Then
            LastRow_1 = .Cells.Find(What:="*", _
                                After:=.Range("A1"), _
                                Lookat:=xlPart, _
                                LookIn:=xlFormulas, _
                                SearchOrder:=xlByRows, _
                                SearchDirection:=xlPrevious, _
                                MatchCase:=False).Row
```

```
        Else
            LastRow_1 = 1
        End If
    End With
End Function

Public Function LastRow_0(wS As Worksheet) As Double
    On Error Resume Next
    LastRow_0 = wS.Cells.Find(What:="*", _
                              After:=ws.Range("A1"), _
                              Lookat:=xlPart, _
                              LookIn:=xlFormulas, _
                              SearchOrder:=xlByRows, _
                              SearchDirection:=xlPrevious, _
                              MatchCase:=False).Row
End Function
```

.

.

End "" .

.

```
Sub FindingLastCol()
    Dim wS As Worksheet, LastCol As Long
    Set wS = ThisWorkbook.Worksheets("Sheet1")

    'Here we look in Row 1
    LastCol = wS.Cells(1, wS.Columns.Count).End(xlToLeft).Column
    Debug.Print LastCol
End Sub
```

- ()

- .
- .ThisWorkbook.ActiveSheet
- Nothing Cell(1, 1) .

:

```
GetMaxCell (Array): Duration: 0.0000790063 seconds
GetMaxCell (Find ): Duration: 0.0002903480 seconds
```

. MicroTimer .

```
Public Function GetLastCell(Optional ByVal ws As Worksheet = Nothing) As Range
    Dim uRng As Range, uArr As Variant, r As Long, c As Long
    Dim ubR As Long, ubC As Long, lRow As Long

    If ws Is Nothing Then Set ws = Application.ThisWorkbook.ActiveSheet
    Set uRng = ws.UsedRange
    uArr = uRng
```

```
    If IsEmpty(uArr) Then
        Set GetLastCell = ws.Cells(1, 1):   Exit Function
    End If
    If Not IsArray(uArr) Then
        Set GetLastCell = ws.Cells(uRng.Row, uRng.Column):  Exit Function
    End If
    ubR = UBound(uArr, 1):  ubC = UBound(uArr, 2)
    For r = ubR To 1 Step -1    '------------------------------------------------ last row
        For c = ubC To 1 Step -1
            If Not IsError(uArr(r, c)) Then
                If Len(Trim$(uArr(r, c))) > 0 Then
                    lRow = r:   Exit For
                End If
            End If
        Next
        If lRow > 0 Then Exit For
    Next
    If lRow = 0 Then lRow = ubR
    For c = ubC To 1 Step -1    '------------------------------------------------ last col
        For r = lRow To 1 Step -1
            If Not IsError(uArr(r, c)) Then
                If Len(Trim$(uArr(r, c))) > 0 Then
                    Set GetLastCell = ws.Cells(lRow + uRng.Row - 1, c + uRng.Column - 1)
                    Exit Function
                End If
            End If
        Next
    Next
End Function
```

```
'Returns last cell (max row & max col) using Find

Public Function GetMaxCell2(Optional ByRef rng As Range = Nothing) As Range 'Using Find

    Const NONEMPTY As String = "*"

    Dim lRow As Range, lCol As Range

    If rng Is Nothing Then Set rng = Application.ThisWorkbook.ActiveSheet.UsedRange

    If WorksheetFunction.CountA(rng) = 0 Then
        Set GetMaxCell2 = rng.Parent.Cells(1, 1)
    Else
        With rng
            Set lRow = .Cells.Find(What:=NONEMPTY, LookIn:=xlFormulas, _
                                   After:=.Cells(1, 1), _
                                   SearchDirection:=xlPrevious, _
                                   SearchOrder:=xlByRows)
            If Not lRow Is Nothing Then
                Set lCol = .Cells.Find(What:=NONEMPTY, LookIn:=xlFormulas, _
                                       After:=.Cells(1, 1), _
                                       SearchDirection:=xlPrevious, _
                                       SearchOrder:=xlByColumns)

                Set GetMaxCell2 = .Parent.Cells(lRow.Row, lCol.Column)
            End If
        End With
    End If
End Function
```

.

MicroTimer :

```
Private Declare PtrSafe Function getFrequency Lib "Kernel32" Alias "QueryPerformanceFrequency"
(cyFrequency As Currency) As Long
Private Declare PtrSafe Function getTickCount Lib "Kernel32" Alias "QueryPerformanceCounter"
(cyTickCount As Currency) As Long

Function MicroTimer() As Double
    Dim cyTicks1 As Currency
    Static cyFrequency As Currency

    MicroTimer = 0
    If cyFrequency = 0 Then getFrequency cyFrequency        'Get frequency
    getTickCount cyTicks1                                   'Get ticks
    If cyFrequency Then MicroTimer = cyTicks1 / cyFrequency 'Returns Seconds
End Function
```

: https://riptutorial.com/ko/excel-vba/topic/918/--------

21:

Excel VBA Excel . **Application** . Excel catchall. Excel **Application** .

Application Excel , .

Examples

: Excel

Application Excel .

```
Sub MinimizeExcel()

    Application.WindowState = xlMinimized

End Sub
```

: Excel VBE

```
Sub DisplayExcelVersions()

    MsgBox "The version of Excel is " & Application.Version
    MsgBox "The version of the VBE is " & Application.VBE.Version

End Sub
```

Application.Version Excel .

: https://riptutorial.com/ko/excel-vba/topic/5645/--

22: ;

. " / / " . 2 . : Autofilter Autofilter ( ).

'VBA .

("MySheet"). ("MyRange"). = (ColumnNumberWithin "MyRange"ToBeFilteredInNumericValue)
Criteria1 : = "WhatIWantToFilter"

' stackoverflow .

Examples

!

("") . . : ( ) "" ? (# 5)? .

	A	B	C	D	E	F	G	H
1	Control Num	DESCRIPTIOI	QUANTI	LOCATI	DATE	ACTIOI		1. How many "Pulp" do we have now? (Total)
2	9005124	Pulp	42	Rack #5	4-Oct-16	In		
15	9005137	Pulp	67	Rack #1	21-Nov-15	Out		
16	9005138	Pulp	92	Rack #3	19-Jun-15	Out		
42	9005164	Pulp	48	Rack #5	1-Dec-15	In		
45	9005167	Pulp	53	Rack #5	17-Mar-15	Out		
50	9005172	Pulp	13	Rack #3	5-Dec-15	In		
55	9005177	Pulp	30	Rack #2	15-Sep-16	In		
56	9005178	Pulp	90	Rack #3	27-Jan-16	Out		
68	9005190	Pulp	67	Rack #7	25-Aug-16	Out		
70	9005192	Pulp	62	Rack #6	7-Nov-15	Out		
71	9005193	Pulp	46	Rack #7	1-Dec-15	Out		
72	9005194	Pulp	6	Rack #2	18-Dec-16	Out		
83	9005205	Pulp	86	Rack #6	30-Mar-16	Out		
102	9005224	Pulp	78	Rack #3	7-Sep-16	Out		
109	9005231	Pulp	19	Rack #1	21-May-15	In		
115	9005237	Pulp	33	Rack #6	14-Jan-15	Out		
121	9005243	Pulp	46	Rack #1	25-Sep-15	Out		
124	9005246	Pulp	48	Rack #1	3-Jan-15	In		
125	9005247	Pulp	39	Rack #3	8-May-16	Out		
142	9005264	Pulp	68	Rack #1	15-Nov-15	In		
146	9005268	Pulp	50	Rack #2	30-Nov-16	In		
154	9005276	Pulp	11	Rack #4	8-Dec-15	In		
156	9005278	Pulp	40	Rack #1	5-Jun-16	In		
169	9005291	Pulp	84	Rack #4	21-Sep-16	Out		
174	9005296	Pulp	31	Rack #1	3-May-16	In		
182	9005304	Pulp	61	Rack #7	9-Apr-16	Out		
190	9005312	Pulp	57	Rack #1	2-Jul-15	Out		
192	9005314	Pulp	56	Rack #2	12-Feb-15	In		
200	9005322	Pulp	43	Rack #7	27-Sep-16	Out		
202	9005324	Pulp	97	Rack #1	16-Apr-16	In		
205	9005327	Pulp	80	Rack #6	8-Nov-16	In		
214	9005336	Pulp	82	Rack #5	27-Jul-15	In		
215	9005337	Pulp	27	Rack #4	17-Sep-16	In		
218	9005340	Pulp	51	Rack #3	16-Nov-15	Out		

Record

:

, .

"SmartFilter" .

2 `Worksheet_Change` .

SmartFilter :

```
Private Sub Worksheet_Change(ByVal Target As Range)
Dim ItemInRange As Range
```

```
Const CellsFilters As String = "C2,E2,G2"
    Call ExcelBusy
    For Each ItemInRange In Target
    If Not Intersect(ItemInRange, Range(CellsFilters)) Is Nothing Then Call Inventory_Filter
    Next ItemInRange
    Call ExcelNormal
End Sub
```

"General_Functions" 1

```
Sub ExcelNormal()
        With Excel.Application
        .EnableEvents = True
        .Cursor = xlDefault
        .ScreenUpdating = True
        .DisplayAlerts = True
        .StatusBar = False
        .CopyObjectsWithCells = True
        End With
End Sub
Sub ExcelBusy()
        With Excel.Application
        .EnableEvents = False
        .Cursor = xlWait
        .ScreenUpdating = False
        .DisplayAlerts = False
        .StatusBar = False
        .CopyObjectsWithCells = True
        End With
End Sub
Sub Select_Sheet(NameSheet As String, Optional VerifyExistanceOnly As Boolean)
    On Error GoTo Err01Select_Sheet
    Sheets(NameSheet).Visible = True
    If VerifyExistanceOnly = False Then ' 1. If VerifyExistanceOnly = False
    Sheets(NameSheet).Select
    Sheets(NameSheet).AutoFilterMode = False
    Sheets(NameSheet).Cells.EntireRow.Hidden = False
    Sheets(NameSheet).Cells.EntireColumn.Hidden = False
    End If ' 1. If VerifyExistanceOnly = False
    If 1 = 2 Then '99. If error
Err01Select_Sheet:
    MsgBox "Err01Select_Sheet: Sheet " & NameSheet & " doesn't exist!", vbCritical: Call
ExcelNormal: On Error GoTo -1: End
    End If '99. If error
End Sub
Function General_Functions_Find_Title(InSheet As String, TitleToFind As String, Optional
InRange As Range, Optional IsNeededToExist As Boolean, Optional IsWhole As Boolean) As Range
Dim DummyRange As Range
    On Error GoTo Err01General_Functions_Find_Title
    If InRange Is Nothing Then ' 1. If InRange Is Nothing
    Set DummyRange = IIf(IsWhole = True, Sheets(InSheet).Cells.Find(TitleToFind,
LookAt:=xlWhole), Sheets(InSheet).Cells.Find(TitleToFind, LookAt:=xlPart))
    Else ' 1. If InRange Is Nothing
    Set DummyRange = IIf(IsWhole = True,
Sheets(InSheet).Range(InRange.Address).Find(TitleToFind, LookAt:=xlWhole),
Sheets(InSheet).Range(InRange.Address).Find(TitleToFind, LookAt:=xlPart))
    End If ' 1. If InRange Is Nothing
    Set General_Functions_Find_Title = DummyRange
    If 1 = 2 Or DummyRange Is Nothing Then '99. If error
Err01General_Functions_Find_Title:
```

```
    If IsNeededToExist = True Then MsgBox "Err01General_Functions_Find_Title: Ttile '" &
TitleToFind & "' was not found in sheet '" & InSheet & "'", vbCritical: Call ExcelNormal: On
Error GoTo -1: End
    End If '99. If error
End Function
```

"Inventory_Handling" 2

```
Const TitleDesc As String = "DESCRIPTION"
Const TitleLocation As String = "LOCATION"
Const TitleActn As String = "ACTION"
Const TitleQty As String = "QUANTITY"
Const SheetRecords As String = "Record"
Const SheetSmartFilter As String = "SmartFilter"
Const RowFilter As Long = 2
Const ColDataToPaste As Long = 2
Const RowDataToPaste As Long = 7
Const RangeInResult As String = "K1"
Const RangeOutResult As String = "K2"
Sub Inventory_Filter()
Dim ColDesc As Long: ColDesc = General_Functions_Find_Title(SheetSmartFilter, TitleDesc,
IsNeededToExist:=True, IsWhole:=True).Column
Dim ColLocation As Long: ColLocation = General_Functions_Find_Title(SheetSmartFilter,
TitleLocation, IsNeededToExist:=True, IsWhole:=True).Column
Dim ColActn As Long: ColActn = General_Functions_Find_Title(SheetSmartFilter, TitleActn,
IsNeededToExist:=True, IsWhole:=True).Column
Dim ColQty As Long: ColQty = General_Functions_Find_Title(SheetSmartFilter, TitleQty,
IsNeededToExist:=True, IsWhole:=True).Column
Dim CounterQty As Long
Dim TotalQty As Long
Dim TotalIn As Long
Dim TotalOut As Long
Dim RangeFiltered As Range
    Call Select_Sheet(SheetSmartFilter)
    If Cells(Rows.Count, ColDataToPaste).End(xlUp).Row > RowDataToPaste - 1 Then
Rows(RowDataToPaste & ":" & Cells(Rows.Count, "B").End(xlUp).Row).Delete
    Sheets(SheetRecords).AutoFilterMode = False
    If Cells(RowFilter, ColDesc).Value <> "" Or Cells(RowFilter, ColLocation).Value <> "" Or
Cells(RowFilter, ColActn).Value <> "" Then ' 1. If Cells(RowFilter, ColDesc).Value <> "" Or
Cells(RowFilter, ColLocation).Value <> "" Or Cells(RowFilter, ColActn).Value <> ""
    With Sheets(SheetRecords).UsedRange
    If Sheets(SheetSmartFilter).Cells(RowFilter, ColDesc).Value <> "" Then .AutoFilter
Field:=General_Functions_Find_Title(SheetRecords, TitleDesc, IsNeededToExist:=True,
IsWhole:=True).Column, Criteria1:=Sheets(SheetSmartFilter).Cells(RowFilter, ColDesc).Value
    If Sheets(SheetSmartFilter).Cells(RowFilter, ColLocation).Value <> "" Then .AutoFilter
Field:=General_Functions_Find_Title(SheetRecords, TitleLocation, IsNeededToExist:=True,
IsWhole:=True).Column, Criteria1:=Sheets(SheetSmartFilter).Cells(RowFilter, ColLocation).Value
    If Sheets(SheetSmartFilter).Cells(RowFilter, ColActn).Value <> "" Then .AutoFilter
Field:=General_Functions_Find_Title(SheetRecords, TitleActn, IsNeededToExist:=True,
IsWhole:=True).Column, Criteria1:=Sheets(SheetSmartFilter).Cells(RowFilter, ColActn).Value
    'If we don't use a filter we would need to use a cycle For/to or For/Each Cell in range
    'to determine whether or not the row meets the criteria that we are looking and then
    'save it on an array, collection, dictionary, etc
    'IG: For CounterRow = 2 To TotalRows
    'If Sheets(SheetSmartFilter).Cells(RowFilter, ColDesc).Value <> "" and
Sheets(SheetRecords).cells(CounterRow,ColDescInRecords).Value=
Sheets(SheetSmartFilter).Cells(RowFilter, ColDesc).Value then
    'Redim Preserve MyUnecessaryArray(UnecessaryNumber) ''Save to array:
(UnecessaryNumber)=MyUnecessaryArray. Or in a dictionary, etc. At the end, we would transpose
this values into the sheet, at the end
```

```
    'both are the same, but, just try to see the time invested on each logic.
    If .Cells(1, 1).End(xlDown).Value <> "" Then Set RangeFiltered = .Rows("2:" &
Sheets(SheetRecords).Cells(Rows.Count, "A").End(xlUp).Row).SpecialCells(xlCellTypeVisible)
    'If it is not <>"" means that there was not filtered data!
    If RangeFiltered Is Nothing Then MsgBox "Err01Inventory_Filter: No data was found with the
given criteria!", vbCritical: Call ExcelNormal: End
    RangeFiltered.Copy Destination:=Cells(RowDataToPaste, ColDataToPaste)
    TotalQty = Cells(Rows.Count, ColQty).End(xlUp).Row
    For CounterQty = RowDataToPaste + 1 To TotalQty
    If Cells(CounterQty, ColActn).Value = "In" Then ' 2. If Cells(CounterQty, ColActn).Value =
"In"
    TotalIn = Cells(CounterQty, ColQty).Value + TotalIn
    ElseIf Cells(CounterQty, ColActn).Value = "Out" Then ' 2. If Cells(CounterQty,
ColActn).Value = "In"
    TotalOut = Cells(CounterQty, ColQty).Value + TotalOut
    End If ' 2. If Cells(CounterQty, ColActn).Value = "In"
    Next CounterQty
    Range(RangeInResult).Value = TotalIn
    Range(RangeOutResult).Value = -(TotalOut)
    End With
    End If ' 1. If Cells(RowFilter, ColDesc).Value <> "" Or Cells(RowFilter,
ColLocation).Value <> "" Or Cells(RowFilter, ColActn).Value <> ""
End Sub
```

:

	A	B	C	D	E	F	G	H	I	J	K
912	9013034	Batch weight	21	Rack #1	9-Jun-16	Out					
913	9013035	Pectin	72	Rack #7	22-Jun-16	In					
914	9013036	Sugar	28	Rack #1	5-Aug-15	In					
915	9013037	Solids content	51	Rack #7	11-Sep-16	In					
916	9013038	Pulp	45	Rack #3	9-Apr-16	Out					
917	9013039	Batch weight	19	Rack #4	6-Apr-15	Out					
918	9013040	Citric Acid	98	Rack #4	17-Jun-16	Out					
919	9013041	Citric Acid	97	Rack #1	29-Feb-16	In					
920	9013042	Pulp	57	Rack #5	25-Nov-16	Out					
921	9013043	Citric Acid	42	Rack #2	27-Feb-16	In					
922	9013044	Batch weight	54	Rack #1	16-Sep-15	Out					
923	9013045	Solids content	12	Rack #4	13-Jul-15	In					
924	9013046	Pulp	79	Rack #4	13-Jul-15	Out					
925	9013047	Citric Acid	36	Rack #4	15-Nov-16	Out					
926	9013048	Sugar	35	Rack #3	5-Feb-16	Out					
927	9013049	Pulp	63	Rack #6	16-Dec-16	Out					
928	9013050	Solids content	48	Rack #4	1-Mar-15	In					
929	9013051	Pulp	39	Rack #4	31-May-16	Out					
930	9013052	Pulp	47	Rack #6	26-Feb-16	In					
931	9013053	Sugar	6	Rack #6	3-Mar-16	Out					
932	9013054	Pulp	53	Rack #2	11-Sep-15	Out					
933	9013055	Solids content	87	Rack #4	19-Jan-15	Out					
934	9013056	Sugar	48	Rack #7	23-Nov-16	In					
935	9013057	Solids content	62	Rack #6	15-May-16	Out					
936	9013058	Batch weight	61	Rack #3	3-Dec-16	Out					
937	9013059	Citric Acid	64	Rack #7	7-Feb-16	Out					
938	9013060	Sugar	91	Rack #7	23-Sep-15	Out					
939	9013061	Citric Acid	29	Rack #1	7-Jul-16	Out					
940	9013062	Citric Acid	31	Rack #6	17-Feb-16	In					
941	9013063	Batch weight	53	Rack #1	5-Apr-15	Out					
942	9013064	Citric Acid	25	Rack #6	30-Jul-15	Out					
943	9013065	Citric Acid	68	Rack #4	22-Mar-16	Out					
944	9013066	Boiling time	22	Rack #6	17-Jun-15	In					
945	9013067	Pectin	99	Rack #2	2-Nov-16	Out					
946	9013068	Solids content	79	Rack #2	17-Nov-16	Out					

SmartFilter | Record

. ( ) .

; : https://riptutorial.com/ko/excel-vba/topic/8645/------

23:

Examples

. ( ) Excel . Object Variant .

.

- . VBA .
- / .
- .
- VBE .

  : VBE Tools → References VBA .

  . VBA .

```
'Looping through a dictionary that was created with late binding¹
Sub iterateDictionaryLate()
    Dim k As Variant, dict As Object

    Set dict = CreateObject("Scripting.Dictionary")
    dict.comparemode = vbTextCompare          'non-case sensitive compare model

    'populate the dictionary
    dict.Add Key:="Red", Item:="Balloon"
    dict.Add Key:="Green", Item:="Balloon"
    dict.Add Key:="Blue", Item:="Balloon"

    'iterate through the keys
    For Each k In dict.Keys
        Debug.Print k & " - " & dict.Item(k)
    Next k

    dict.Remove "blue"      'remove individual key/item pair by key
    dict.RemoveAll          'remove all remaining key/item pairs

End Sub

'Looping through a dictionary that was created with early binding¹
Sub iterateDictionaryEarly()
    Dim d As Long, k As Variant
    Dim dict As New Scripting.Dictionary

    dict.CompareMode = vbTextCompare          'non-case sensitive compare model

    'populate the dictionary
    dict.Add Key:="Red", Item:="Balloon"
    dict.Add Key:="Green", Item:="Balloon"
    dict.Add Key:="Blue", Item:="Balloon"
    dict.Add Key:="White", Item:="Balloon"

    'iterate through the keys
    For Each k In dict.Keys
        Debug.Print k & " - " & dict.Item(k)
    Next k
```

```
    'iterate through the keys by the count
    For d = 0 To dict.Count - 1
        Debug.Print dict.Keys(d) & " - " & dict.Items(d)
    Next d

    'iterate through the keys by the boundaries of the keys collection
    For d = LBound(dict.Keys) To UBound(dict.Keys)
        Debug.Print dict.Keys(d) & " - " & dict.Items(d)
    Next d

    dict.Remove "blue"                          'remove individual key/item pair by key
    dict.Remove dict.Keys(0)                    'remove first key/item by index position
    dict.Remove dict.Keys(UBound(dict.Keys))    'remove last key/item by index position
    dict.RemoveAll                              'remove all remaining key/item pairs

End Sub
```

. . .

. > . . .

. VBE IntelliSense .

: https://riptutorial.com/ko/excel-vba/topic/3811/

24:

Examples

If

If () . True False (: x > 2 .

If . If Then .

1. If True .

If

If True . . End If .

```
If [Some condition is True] Then [Do something]
```

If

True If .

```
If [Some condition is True] Then
  [Do some things]
End If
```

If End If End If .

2. If , True False .

If , Else

True False . Else . . End If .

```
If [Some condition is True] Then [Do something] Else [Do something else]
```

If , Else

If , Else True False

```
If [Some condition is True] Then
   [Do some things]
Else
   [Do some other things]
End If
```

If End If End If .

3. False .

If . , If . .

If , ElseIf , ... , Else

If ElseIf . ElseIf If False If .

```
If [Some condition is True] Then
   [Do some thing(s)]
ElseIf [Some other condition is True] Then
   [Do some different thing(s)]
Else    'Everything above has evaluated to False
   [Do some other thing(s)]
End If
```

If End If ElseIf . ElseIf Else ( ) End If .

: https://riptutorial.com/ko/excel-vba/topic/9632/

25:

Examples

Series . Series Worksheet ChartObject Chart . Series Range Values XValues .
Series . Name . . Range . SERIES . SERIES .

Chart Worksheet . . .

```
Sub CreateChartWithRangesAndFixedName()

    Dim xData As Range
    Dim yData As Range
    Dim serName As Range

    'set the ranges to get the data and y value label
    Set xData = Range("B3:B12")
    Set yData = Range("C3:C12")
    Set serName = Range("C2")

    'get reference to ActiveSheet
    Dim sht As Worksheet
    Set sht = ActiveSheet

    'create a new ChartObject at position (48, 195) with width 400 and height 300
    Dim chtObj As ChartObject
    Set chtObj = sht.ChartObjects.Add(48, 195, 400, 300)

    'get reference to chart object
    Dim cht As Chart
    Set cht = chtObj.Chart

    'create the new series
    Dim ser As Series
    Set ser = cht.SeriesCollection.NewSeries

    ser.Values = yData
    ser.XValues = xData
    ser.Name = serName

    ser.ChartType = xlXYScatterLines

End Sub
```

/ Chart

SERIES Range "B" .

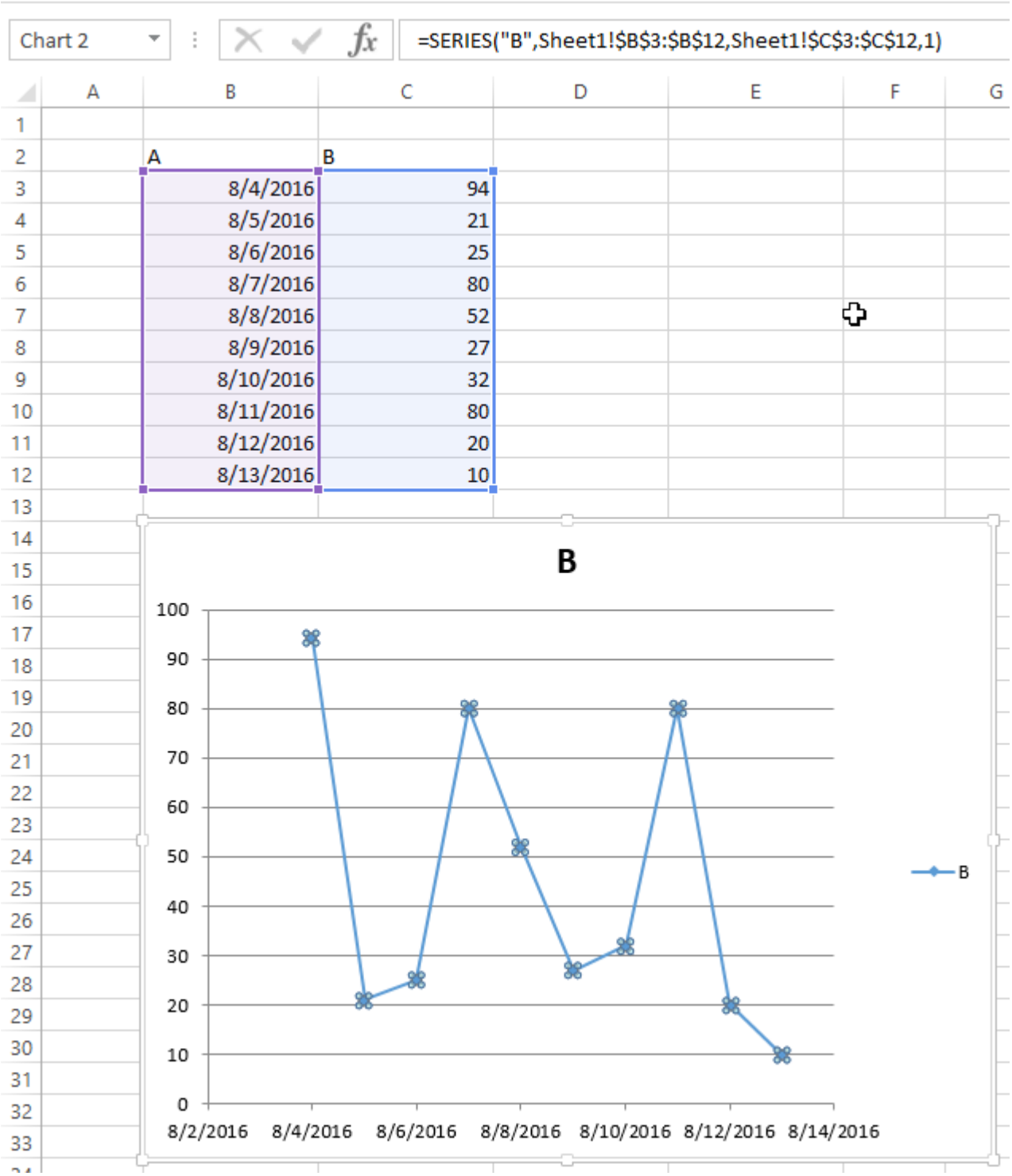


Chart . Chart .

ChartObject . ChartObjects.Add(Left, Top, Width, Height) . ChartObject Chart . ChartObject Shape .

```
Sub CreateEmptyChart()

    'get reference to ActiveSheet
    Dim sht As Worksheet
    Set sht = ActiveSheet

    'create a new ChartObject at position (0, 0) with width 400 and height 300
    Dim chtObj As ChartObject
```

```
    Set chtObj = sht.ChartObjects.Add(0, 0, 400, 300)

    'get refernce to chart object
    Dim cht As Chart
    Set cht = chtObj.Chart

    'additional code to modify the empty chart
    '...

End Sub
```

SERIES

Chart Series (Series) SERIES . Range SERIES .

SERIES .

```
=SERIES(Name,XValues,Values,Order)
```

. Order . . .

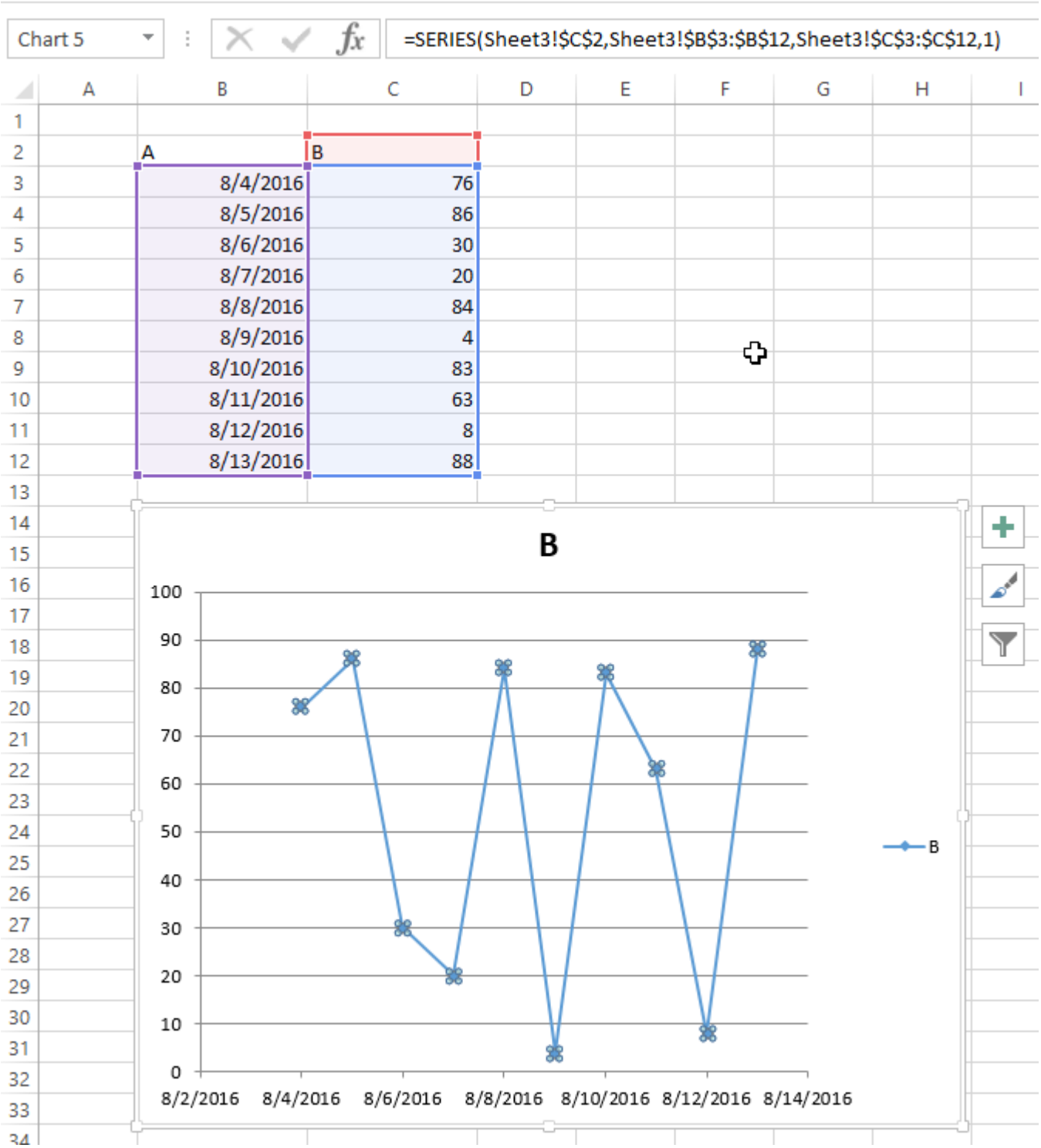
SERIES

SERIES .Address(,,,True) . . .

```
Sub CreateChartUsingSeriesFormula()

    Dim xData As Range
```

```
    Dim yData As Range
    Dim serName As Range

    'set the ranges to get the data and y value label
    Set xData = Range("B3:B12")
    Set yData = Range("C3:C12")
    Set serName = Range("C2")

    'get reference to ActiveSheet
    Dim sht As Worksheet
    Set sht = ActiveSheet

    'create a new ChartObject at position (48, 195) with width 400 and height 300
    Dim chtObj As ChartObject
    Set chtObj = sht.ChartObjects.Add(48, 195, 400, 300)

    'get refernce to chart object
    Dim cht As Chart
    Set cht = chtObj.Chart

    'create the new series
    Dim ser As Series
    Set ser = cht.SeriesCollection.NewSeries

    'set the SERIES formula
    '=SERIES(name, xData, yData, plotOrder)

    Dim formulaValue As String
    formulaValue = "=SERIES(" & _
        serName.Address(, , , True) & "," & _
        xData.Address(, , , True) & "," & _
        yData.Address(, , , True) & ",1)"

    ser.Formula = formulaValue
    ser.ChartType = xlXYScatterLines

End Sub
```

., Chart .



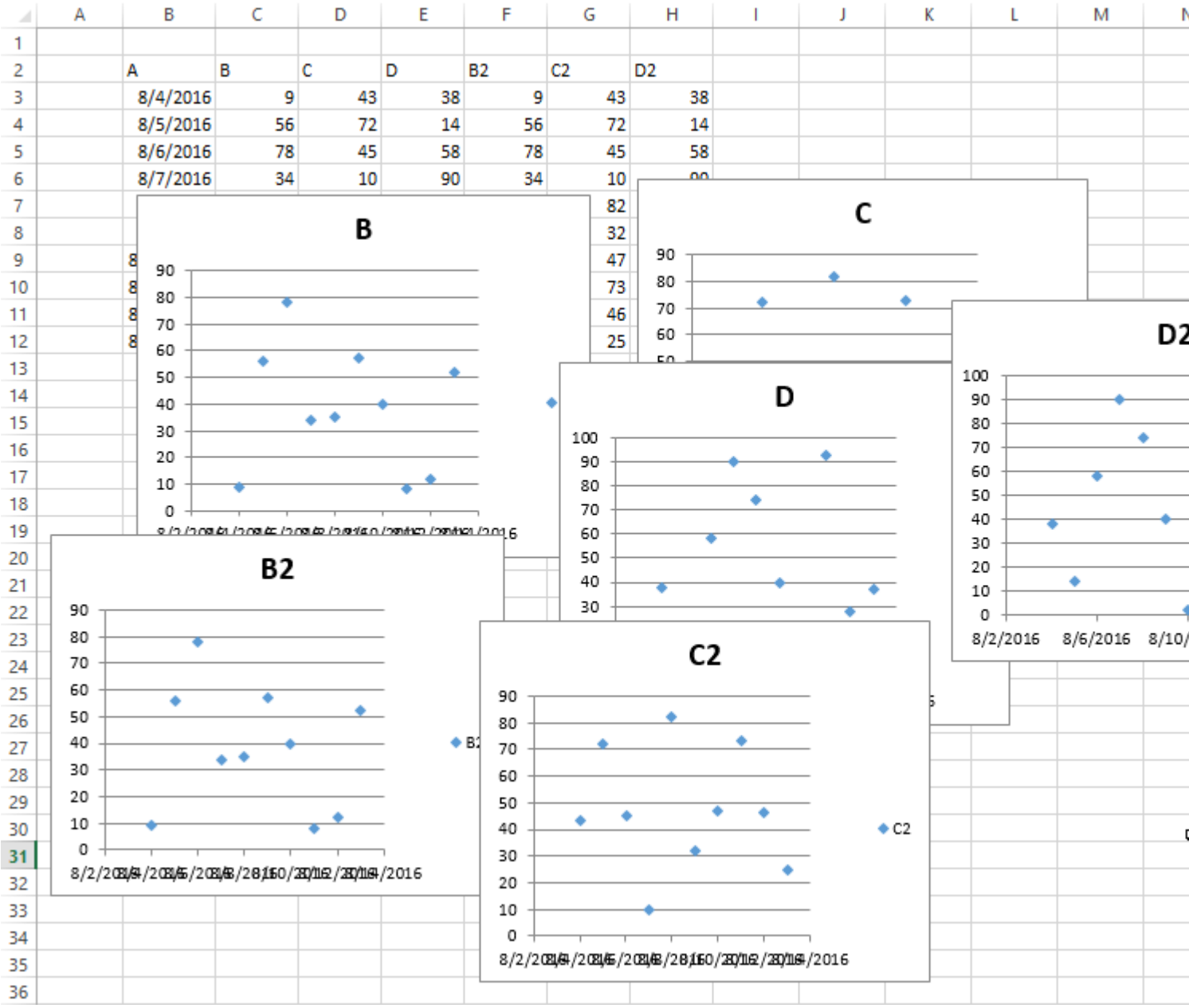
Excel . "" , ALT . VBA .

(,) , . .

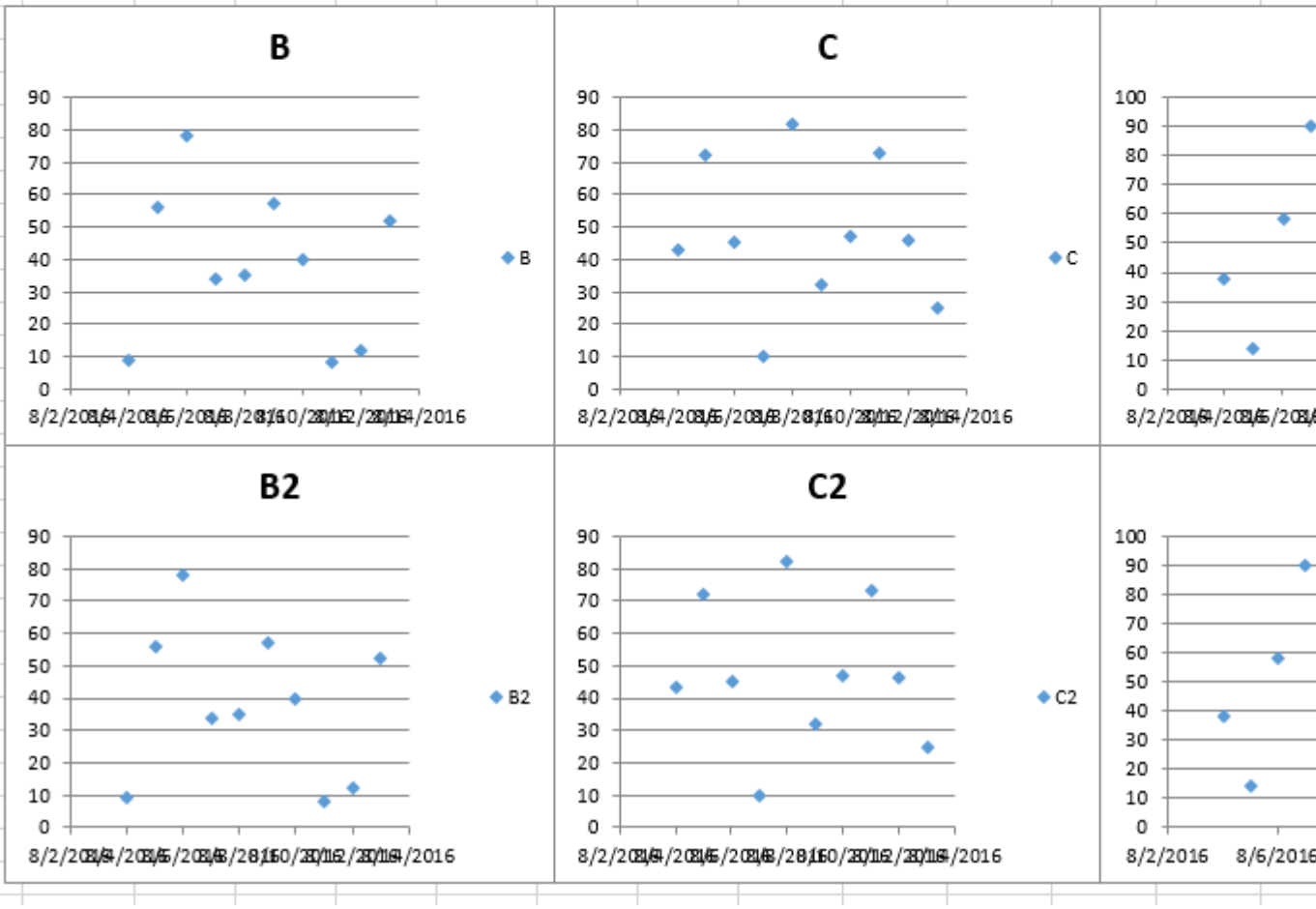
```
Sub CreateGridOfCharts()

    Dim int_cols As Integer
    int_cols = 3

    Dim cht_width As Double
    cht_width = 250

    Dim cht_height As Double
```

```
    cht_height = 200

    Dim offset_vertical As Double
    offset_vertical = 195

    Dim offset_horz As Double
    offset_horz = 40

    Dim sht As Worksheet
    Set sht = ActiveSheet

    Dim count As Integer
    count = 0

    'iterate through ChartObjects on current sheet
    Dim cht_obj As ChartObject
    For Each cht_obj In sht.ChartObjects

        'use integer division and Mod to get position in grid
        cht_obj.Top = (count \ int_cols) * cht_height + offset_vertical
        cht_obj.Left = (count Mod int_cols) * cht_width + offset_horz
        cht_obj.Width = cht_width
        cht_obj.Height = cht_height

        count = count + 1

    Next cht_obj
End Sub
```

.


A B C D B2 C2 D2
8/4/2016 9 43 38 9 43 38
8/5/2016 56 72 14 56 72 14
8/6/2016 78 45 58 78 45 58
8/7/2016 34 10 90 34 10
B
C
D
D2
B2
C2
8/2/2016
8/6/2016

A	B	C	D	E	F	G	H
	8/4/2016	9	43	38	9	43	38
	8/5/2016	56	72	14	56	72	14
	8/6/2016	78	45	58	78	45	58
	8/7/2016	34	10	90	34	10	90
	8/8/2016	35	82	74	35	82	74
	8/9/2016	57	32	40	57	32	40
	8/10/2016	40	47	2	40	47	2
	8/11/2016	8	73	93	8	73	93
	8/12/2016	12	46	28	12	46	28
	8/13/2016	52	25	37	52	25	37



: https://riptutorial.com/ko/excel-vba/topic/4968/--

26:

Activex . 5 Jimi Hendrix .

Examples

.

Worksheet_SelectionChange . " " "Selection_Change" . .

```
Private Sub Worksheet_SelectionChange(ByVal Target As Range)

   ComboBox1_Change

End Sub
```

ComboBox Change . . CLEAR . .

```
Private Sub ComboBox1_Change()

Dim myarray(0 To 5)
    myarray(0) = "Hey Joe"
    myarray(1) = "Little Wing"
    myarray(2) = "Voodoo Child"
    myarray(3) = "Purple Haze"
    myarray(4) = "The Wind Cries Mary"
    myarray(5) = "CLEAR"

    With ComboBox1
        .List = myarray()
    End With

    FillACell myarray()

End Sub
```

null . . . . CLEAR .

.

```
Sub FillACell(MyArray As Variant)

Dim n As Integer

n = ComboBox1.ListIndex

ComboBox1.Left = ActiveCell.Left
ComboBox1.Top = ActiveCell.Top
Columns(ActiveCell.Column).ColumnWidth = ComboBox1.Width * 0.18

ActiveCell = MyArray(n)

If ComboBox1 = "CLEAR" Then
```

```
    Range(ActiveCell.Address) = ""
End If

End Sub
```

2 :

.

.

1. .
2. LinkedCell .
3. . .

```
Private Sub cboNotIncl_Change()

Dim n As Long
Dim notincl_array(1 To 9) As String

n = myTarget.Row

    If n >= 3 And n < 10000 Then

        If myTarget.Address = "$G$" & n Then

            'set up the array elements for the not included services
            notincl_array(1) = "Central Air"
            notincl_array(2) = "Hot Water"
            notincl_array(3) = "Heater Rental"
            notincl_array(4) = "Utilities"
            notincl_array(5) = "Parking"
            notincl_array(6) = "Internet"
            notincl_array(7) = "Hydro"
            notincl_array(8) = "Hydro/Hot Water/Heater Rental"
            notincl_array(9) = "Hydro and Utilities"

            cboNotIncl.List = notincl_array()

        Else

            Exit Sub

        End If

        With cboNotIncl

            'make sure the combo box moves to the target cell
            .Left = myTarget.Left
            .Top = myTarget.Top

            'adjust the size of the cell to fit the combo box
            myTarget.ColumnWidth = .Width * 0.18

            'make it look nice by editing some of the font attributes
            .Font.Size = 11
            .Font.Bold = False
```

```
            'populate the cell with the user choice, with a backup guarantee that it's in
column G

            If myTarget.Address = "$G$" & n Then

                    .LinkedCell = myTarget.Address

                    'prevent an error where a numerical value is formatted as text
                    myTarget.EntireColumn.TextToColumns

            End If

        End With

    End If 'ensure that the active cell is only between rows 3 and 1000

End Sub
```

SelectionChange .

```
Public myTarget As Range

Private Sub Worksheet_SelectionChange(ByVal Target As Range)

    Set myTarget = Target

    'switch for Not Included
    If Target.Column = 7 And Target.Cells.Count = 1 Then

        Application.Run "Module1.cboNotIncl_Change"

    End If

End Sub
```

: https://riptutorial.com/ko/excel-vba/topic/8929/---------

27:

Examples

Excel VBA . ".xlsm" VBA . . VBA , , , .

VBA `Application` `Workbooks` Excel . MSDN .

ActiveWorkbook ThisWorkbook

VBA VBA . VBA (`ActiveWorkbook`) .

```
'--- the currently active workbook (and worksheet) is implied
Range("A1").value = 3.1415
Cells(1, 1).value = 3.1415
```

VBA Excel `ActiveWorkbook` . ( ) UDF . () A1 `=EarlyOrLate()` VBA . UDF (User Defined Function) .

```
Public Function EarlyOrLate() As String
    If Hour(Now) > ThisWorkbook.Sheets("WatchTime").Range("A1") Then
        EarlyOrLate = "It's Late!"
    Else
        EarlyOrLate = "It's Early!"
    End If
End Function
```

UDF Excel . "WatchTime" . UDF `ThisWorkbook` `ActiveWorkbook` .

A ()

`Workbooks` .

```
dim myWB as Workbook
Set myWB = Workbooks("UsuallyFullPathnameOfWorkbook.xlsx")
```

`Workbooks` `Add` .

```
Dim myNewWB as Workbook
Set myNewWB = Workbooks.Add
```

. .

```
Option Explicit
Function GetWorkbook(ByVal wbFilename As String) As Workbook
    '--- returns a workbook object for the given filename, including checks
    '    for when the workbook is already open, exists but not open, or
    '    does not yet exist (and must be created)
    '    ***  wbFilename must be a fully specified pathname
```

```
    Dim folderFile As String
    Dim returnedWB As Workbook

    '--- check if the file exists in the directory location
    folderFile = File(wbFilename)
    If folderFile = "" Then
        '--- the workbook doesn't exist, so create it
        Dim pos1 As Integer
        Dim fileExt As String
        Dim fileFormatNum As Long
        '--- in order to save the workbook correctly, we need to infer which workbook
        '    type the user intended from the file extension
        pos1 = InStrRev(sFullName, ".", , vbTextCompare)
        fileExt = Right(sFullName, Len(sFullName) - pos1)
        Select Case fileExt
            Case "xlsx"
                fileFormatNum = 51
            Case "xlsm"
                fileFormatNum = 52
            Case "xls"
                fileFormatNum = 56
            Case "xlsb"
                fileFormatNum = 50
            Case Else
                Err.Raise vbObjectError + 1000, "GetWorkbook function", _
                         "The file type you've requested (file extension) is not recognized. "
& _
                         "Please use a known extension: xlsx, xlsm, xls, or xlsb."
        End Select
        Set returnedWB = Workbooks.Add
        Application.DisplayAlerts = False
        returnedWB.SaveAs filename:=wbFilename, FileFormat:=fileFormatNum
        Application.DisplayAlerts = True
        Set GetWorkbook = returnedWB
    Else
        '--- the workbook exists in the directory, so check to see if
        '    it's already open or not
        On Error Resume Next
        Set returnedWB = Workbooks(sFile)
        If returnedWB Is Nothing Then
            Set returnedWB = Workbooks.Open(sFullName)
        End If
    End If
End Function
```

VBA .

.

```
Application.DisplayAlerts = False        'disable user prompt to overwrite file
myWB.SaveAs FileName:="NewOrExistingFilename.xlsx"
Application.DisplayAlerts = True         're-enable user prompt to overwrite file
```

Excel "" 3 . VBA .

```
'--- save the current Excel global setting
With Application
    Dim oldSheetsCount As Integer
```

```
    oldSheetsCount = .SheetsInNewWorkbook
    Dim myNewWB As Workbook
    .SheetsInNewWorkbook = 1
    Set myNewWB = .Workbooks.Add
    '--- restore the previous setting
    .SheetsInNewWorkbook = oldsheetcount
End With
```

: https://riptutorial.com/ko/excel-vba/topic/2969/-

28:

Examples

, , .

:

```
Sub FileExists()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    If fso.FileExists("D:\test.txt") = True Then
       MsgBox "The file is exists."
    Else
       MsgBox "The file isn't exists."
    End If
End Sub
```

:

```
Sub FolderExists()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    If fso.FolderExists("D:\testFolder") = True Then
       MsgBox "The folder is exists."
    Else
       MsgBox "The folder isn't exists."
    End If
End Sub
```

:

```
Sub DriveExists()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    If fso.DriveExists("D:\") = True Then
       MsgBox "The drive is exists."
    Else
       MsgBox "The drive isn't exists."
    End If
End Sub
```

:

```
Sub CopyFile()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.CopyFile "c:\Documents and Settings\Makro.txt", "c:\Documents and Settings\Macros\"
End Sub
```

-
-

```
Sub MoveFile()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.MoveFile "c:\*.txt", "c:\Documents and Settings\"
End Sub
```

-
-

```
Sub DeleteFile()
    Dim fso
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.DeleteFile "c:\Documents and Settings\Macros\Makro.txt"
End Sub
```

-
-

```
Sub CreateFolder()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.CreateFolder "c:\Documents and Settings\NewFolder"
End Sub
```

-
-

```
Sub CopyFolder()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.CopyFolder "C:\Documents and Settings\NewFolder", "C:\"
End Sub
```

-
-

```
Sub MoveFolder()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.MoveFolder "C:\Documents and Settings\NewFolder", "C:\"
```

```
End Sub
```

:
:

```
Sub DeleteFolder()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    fso.DeleteFolder "C:\Documents and Settings\NewFolder"
End Sub
```

:
:

```
Sub GetFileName()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    MsgBox fso.GetFileName("c:\Documents and Settings\Makro.txt")
End Sub
```

: Makro.txt

:
:

```
Sub GetBaseName()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    MsgBox fso.GetBaseName("c:\Documents and Settings\Makro.txt")
End Sub
```

: Makro

:
:

```
Sub GetExtensionName()
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    MsgBox fso.GetExtensionName("c:\Documents and Settings\Makro.txt")
End Sub
```

: txt

:
:

```
Sub GetDriveName()
```

```
    Dim fso as Scripting.FileSystemObject
    Set fso = CreateObject("Scripting.FileSystemObject")
    MsgBox fso.GetDriveName("c:\Documents and Settings\Makro.txt")
End Sub
```

: c :

: https://riptutorial.com/ko/excel-vba/topic/9933/--

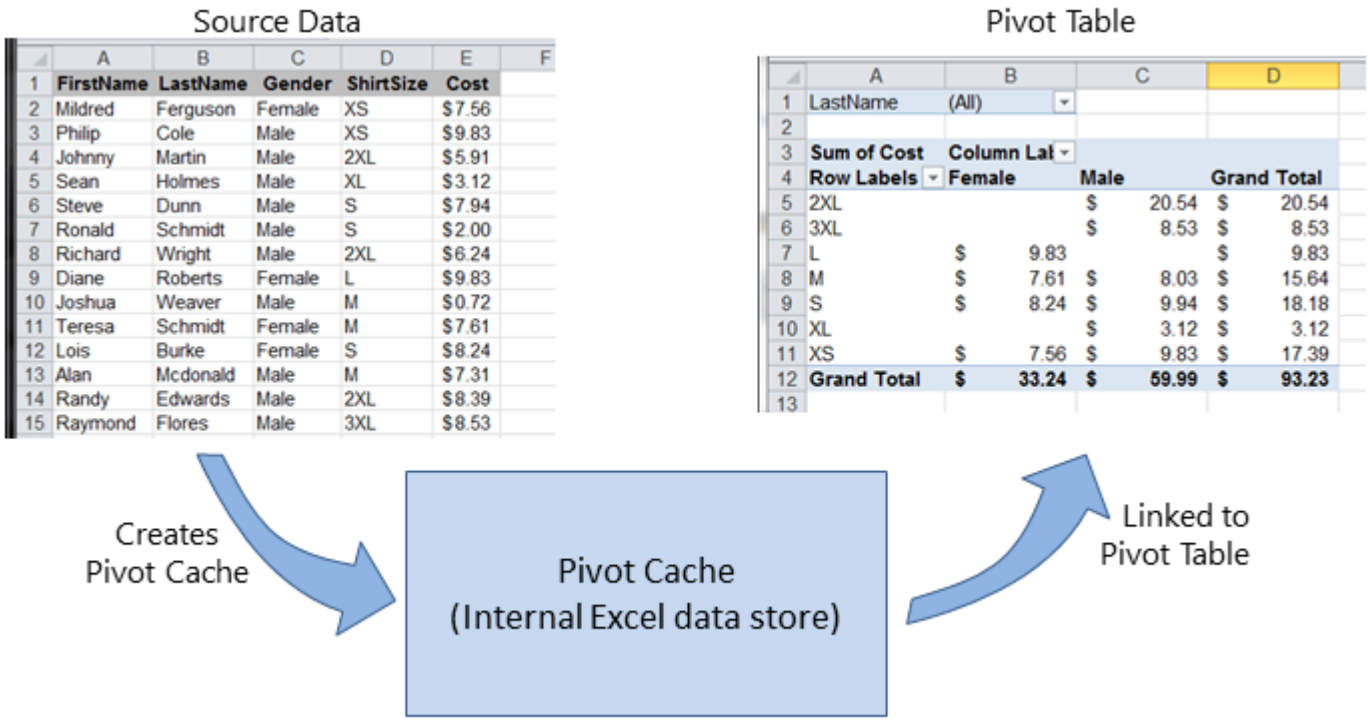
29:

. . .

Examples

Excel . VBA .

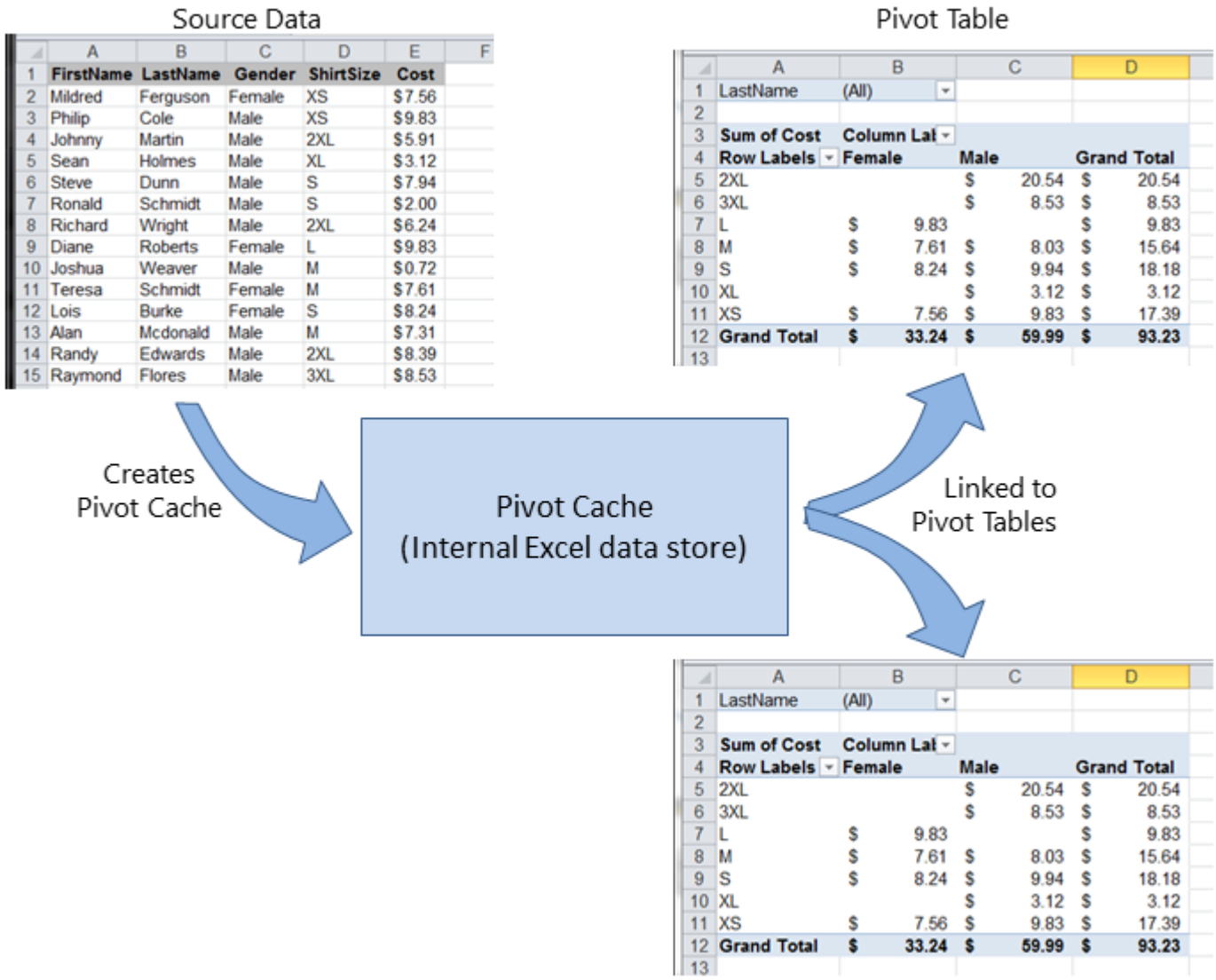
`Worksheet` `Range` . . . .



	A	B	C	D	E	F
1	FirstName	LastName	Gender	ShirtSize	Cost	
2	Mildred	Ferguson	Female	XS	$7.56	
3	Philip	Cole	Male	XS	$9.83	
4	Johnny	Martin	Male	2XL	$5.91	
5	Sean	Holmes	Male	XL	$3.12	
6	Steve	Dunn	Male	S	$7.94	
7	Ronald	Schmidt	Male	S	$2.00	
8	Richard	Wright	Male	2XL	$6.24	
9	Diane	Roberts	Female	L	$9.83	
10	Joshua	Weaver	Male	M	$0.72	
11	Teresa	Schmidt	Female	M	$7.61	
12	Lois	Burke	Female	S	$8.24	
13	Alan	Mcdonald	Male	M	$7.31	
14	Randy	Edwards	Male	2XL	$8.39	
15	Raymond	Flores	Male	3XL	$8.53	

	A	B	C	D
1	LastName	(All)		
2				
3	Sum of Cost	Column Lal		
4	Row Labels	Female	Male	Grand Total
5	2XL		$ 20.54	$ 20.54
6	3XL		$ 8.53	$ 8.53
7	L	$ 9.83		$ 9.83
8	M	$ 7.61	$ 8.03	$ 15.64
9	S	$ 8.24	$ 9.94	$ 18.18
10	XL		$ 3.12	$ 3.12
11	XS	$ 7.56	$ 9.83	$ 17.39
12	Grand Total	$ 33.24	$ 59.99	$ 93.23
13				

. Excel .



	A	B	C	D	E
1	FirstName	LastName	Gender	ShirtSize	Cost
2	Mildred	Ferguson	Female	XS	$7.56
3	Philip	Cole	Male	XS	$9.83
4	Johnny	Martin	Male	2XL	$5.91
5	Sean	Holmes	Male	XL	$3.12
6	Steve	Dunn	Male	S	$7.94
7	Ronald	Schmidt	Male	S	$2.00
8	Richard	Wright	Male	2XL	$6.24
9	Diane	Roberts	Female	L	$9.83
10	Joshua	Weaver	Male	M	$0.72
11	Teresa	Schmidt	Female	M	$7.61
12	Lois	Burke	Female	S	$8.24
13	Alan	Mcdonald	Male	M	$7.31
14	Randy	Edwards	Male	2XL	$8.39
15	Raymond	Flores	Male	3XL	$8.53

	A	B	C	D
1	LastName	(All)		
2				
3	Sum of Cost	Column Lal		
4	Row Labels	Female	Male	Grand Total
5	2XL		$ 20.54	$ 20.54
6	3XL		$ 8.53	$ 8.53
7	L	$ 9.83		$ 9.83
8	M	$ 7.61	$ 8.03	$ 15.64
9	S	$ 8.24	$ 9.94	$ 18.18
10	XL		$ 3.12	$ 3.12
11	XS	$ 7.56	$ 9.83	$ 17.39
12	Grand Total	$ 33.24	$ 59.99	$ 93.23
13				

, .

```
Sub test()
    Dim pt As PivotTable
    Set pt = CreatePivotTable(ThisWorkbook.Sheets("Sheet1").Range("A1:E15"))
End Sub

Function CreatePivotTable(ByRef srcData As Range) As PivotTable
    '--- creates a Pivot Table from the given source data and
    '    assumes that the first row contains valid header data
    '    for the columns
    Dim thisPivot As PivotTable
    Dim dataSheet As Worksheet
    Dim ptSheet As Worksheet
    Dim ptCache As PivotCache

    '--- the Pivot Cache must be created first...
    Set ptCache = ThisWorkbook.PivotCaches.Create(SourceType:=xlDatabase, _
                                                  SourceData:=srcData)
    '--- ... then use the Pivot Cache to create the Table
    Set ptSheet = ThisWorkbook.Sheets.Add
    Set thisPivot = ptCache.CreatePivotTable(TableDestination:=ptSheet.Range("A3"))
    Set CreatePivotTable = thisPivot
End Function
```

MSDN

Pivot Tables .

- JBA Peltier VBA
- VBA Excel - globaliconnect Excel VBA

. . .

```
Dim thisPivot As PivotTable
Dim ptSheet As Worksheet
Dim ptField As PivotField

Set ptSheet = ThisWorkbook.Sheets("SheetNameWithPivotTable")
Set thisPivot = ptSheet.PivotTables(1)

With thisPivot
    Set ptField = .PivotFields("Gender")
    ptField.Orientation = xlRowField
    ptField.Position = 1
    Set ptField = .PivotFields("LastName")
    ptField.Orientation = xlRowField
    ptField.Position = 2
    Set ptField = .PivotFields("ShirtSize")
    ptField.Orientation = xlColumnField
    ptField.Position = 1
    Set ptField = .AddDataField(.PivotFields("Cost"), "Sum of Cost", xlSum)
    .InGridDropZones = True
    .RowAxisLayout xlTabularRow
End With
```

(`DataBodyRange`) / . `Range` . .

: `TableStyle2` `TableStyle` `PivotTable` .

```
Dim thisPivot As PivotTable
Dim ptSheet As Worksheet
Dim ptField As PivotField

Set ptSheet = ThisWorkbook.Sheets("SheetNameWithPivotTable")
Set thisPivot = ptSheet.PivotTables(1)

With thisPivot
    .DataBodyRange.NumberFormat = "_($* #,##0.00_);_($* (#,##0.00);_($* "-"??_);_(@_)"
    .DataBodyRange.HorizontalAlignment = xlRight
    .ColumnRange.HorizontalAlignment = xlCenter
    .TableStyle2 = "PivotStyleMedium9"
End With
```

: https://riptutorial.com/ko/excel-vba/topic/3797/-

30:

Examples

```
Option Explicit

Sub LoopAllSheets()

Dim sht As Excel.Worksheet
' declare an array of type String without committing to maximum number of members
Dim sht_Name() As String
Dim i As Integer

' get the number of worksheets in Active  Workbook , and put it as the maximum number of
members in the array
ReDim sht_Name(1 To ActiveWorkbook.Worksheets.count)

i = 1

' loop through all worksheets in Active Workbook
For Each sht In ActiveWorkbook.Worksheets
    sht_Name(i) = sht.Name ' get the name of each worksheet and save it in the array
    i = i + 1
Next sht

End Sub
```

```
 Sub Theloopofloops()

 Dim wbk As Workbook
 Dim Filename As String
 Dim path As String
 Dim rCell As Range
 Dim rRng As Range
 Dim wsO As Worksheet
 Dim sheet As Worksheet


 path = "pathtofile(s)" & "\"
 Filename = Dir(path & "*.xl??")
 Set wsO = ThisWorkbook.Sheets("Sheet1") 'included in case you need to differentiate_
              between workbooks i.e currently opened workbook vs workbook containing code

 Do While Len(Filename) > 0
     DoEvents
     Set wbk = Workbooks.Open(path & Filename, True, True)
         For Each sheet In ActiveWorkbook.Worksheets  'this needs to be adjusted for
specifiying sheets. Repeat loop for each sheet so thats on a per sheet basis
                Set rRng = sheet.Range("a1:a1000") 'OBV needs to be changed
                For Each rCell In rRng.Cells
                If rCell <> "" And rCell.Value <> vbNullString And rCell.Value <> 0 Then

                   'code that does stuff

                End If
                Next rCell
```

```
        Next sheet
    wbk.Close False
    Filename = Dir
Loop
End Sub
```

: https://riptutorial.com/ko/excel-vba/topic/1144/-----

31:

Examples

worksheet , range cells .

:

```
ThisWorkbook.Worksheets("Sheet1").Range(Cells(1, 2), Cells(2, 3)).Copy
```

: Cells . ActiveSheet . Sheet1 ActiveSheet ( ).

With .

```
With ThisWorkbook.Worksheets("Sheet1")
    .Range(.Cells(1, 2), .Cells(2, 3)).Copy
End With
```

. (.)

```
Dim ws1 As Worksheet
Set ws1 = ThisWorkbook.Worksheets("Sheet1")
ws1.Range(ws1.Cells(1, 2), ws1.Cells(2, 3)).Copy
```

Worksheets . :

```
Worksheets("Sheet1").Copy
```

Sheet1 . . .

```
ThisWorkbook.Worksheets("Sheet1")        '<--ThisWorkbook refers to the workbook containing
                                         'the running VBA code
Workbooks("Book1").Worksheets("Sheet1") '<--Where Book1 is the workbook containing Sheet1
```

.

```
ActiveWorkbook.Worksheets("Sheet1")      '<--Valid, but if another workbook is activated
                                         'the reference will be changed
```

range range .

```
Range("a1")
```

:

```
ActiveSheet.Range("a1")
```

( ) . :

```
Dim i As Long
With Workbooks("Book1").Worksheets("Sheet1")
    For i = 1 To 4
        If IsEmpty(.Cells(i, 1)) Then .Rows(i).Delete
    Next i
End With
```

. , 3 4 3. `i` 4 . .

```
Dim i As Long
With Workbooks("Book1").Worksheets("Sheet1")
    For i = 4 To 1 Step -1
        If IsEmpty(.Cells(i, 1)) Then .Rows(i).Delete
    Next i
End With
```

ActiveWorkbook ThisWorkbook

`ActiveWorkbook` `ThisWorkbook` VBA . Application .

`ActiveWorkbook` Excel . *(:)*

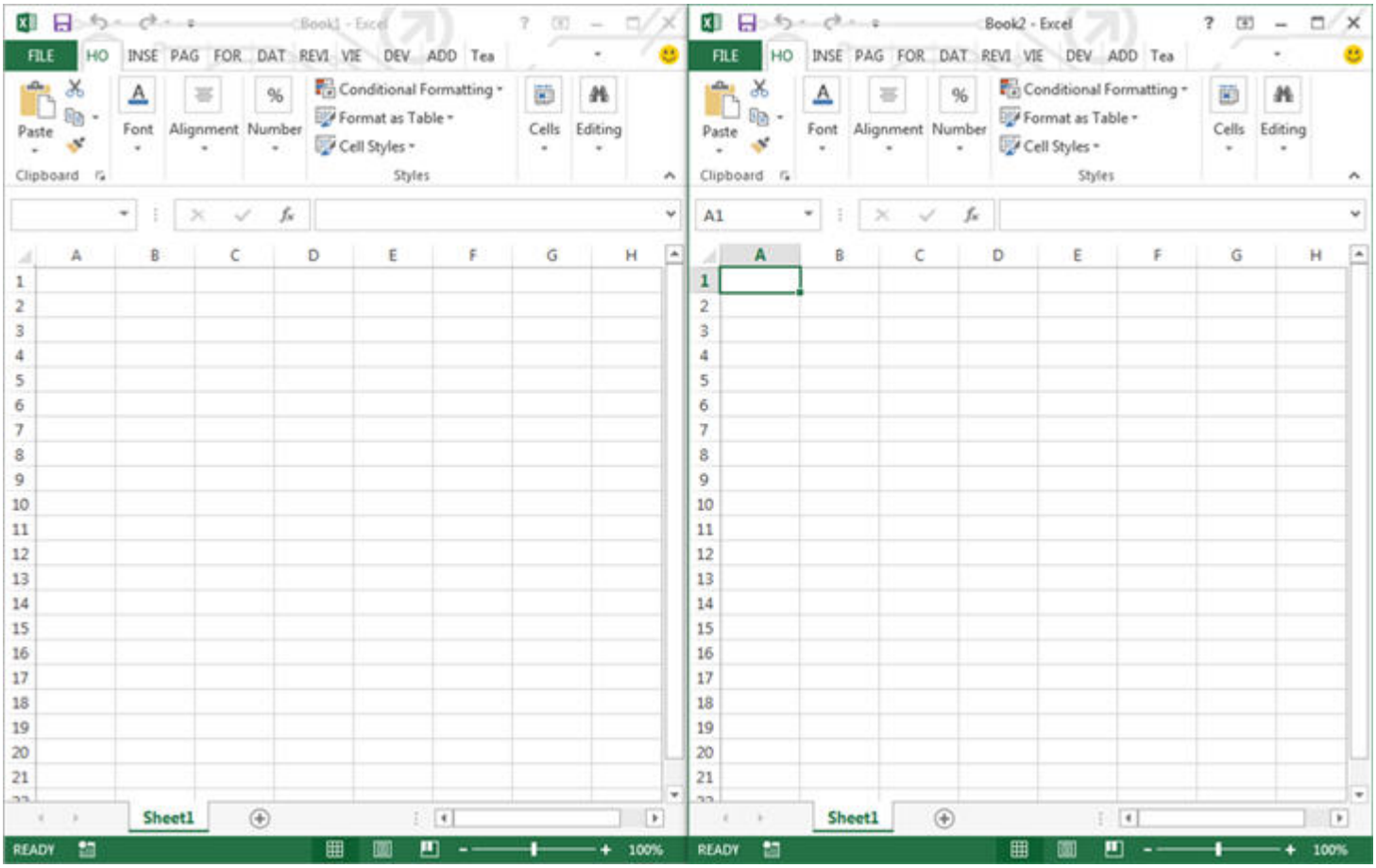
```
Sub ActiveWorkbookExample()

'// Let's assume that 'Other Workbook.xlsx' has "Bar" written in A1.

    ActiveWorkbook.ActiveSheet.Range("A1").Value = "Foo"
    Debug.Print ActiveWorkbook.ActiveSheet.Range("A1").Value '// Prints "Foo"

    Workbooks.Open("C:\Users\BloggsJ\Other Workbook.xlsx")
    Debug.Print ActiveWorkbook.ActiveSheet.Range("A1").Value '// Prints "Bar"

    Workbooks.Add 1
    Debug.Print ActiveWorkbook.ActiveSheet.Range("A1").Value '// Prints nothing

End Sub
```

`ThisWorkbook` .

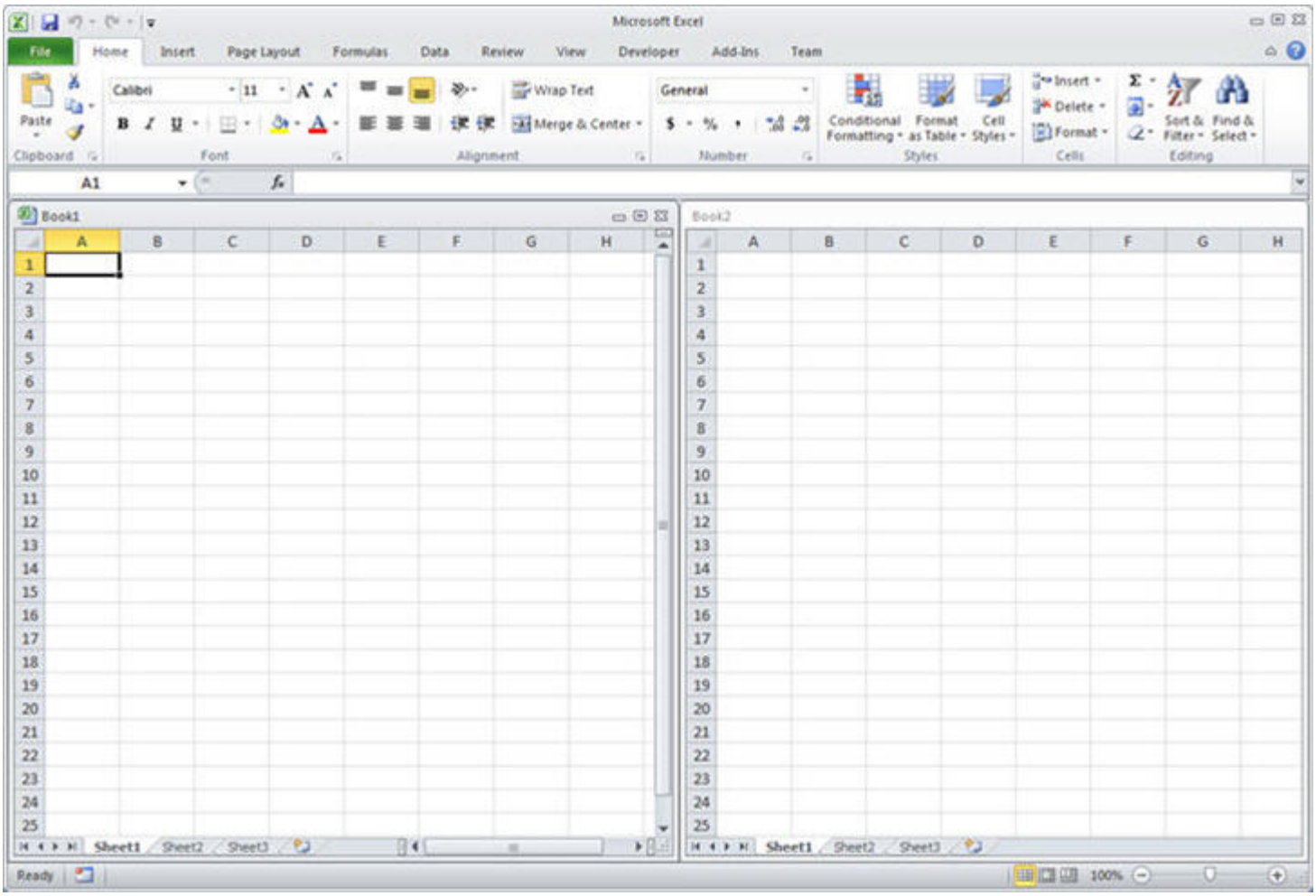
```
Sub ThisWorkbookExample()

'// Let's assume to begin that this code is in the same workbook that is currently active

    ActiveWorkbook.Sheet1.Range("A1").Value = "Foo"
    Workbooks.Add 1
    ActiveWorkbook.ActiveSheet.Range("A1").Value = "Bar"

    Debug.Print ActiveWorkbook.ActiveSheet.Range("A1").Value '// Prints "Bar"
    Debug.Print ThisWorkbook.Sheet1.Range("A1").Value '// Prints "Foo"

End Sub
```

Microsoft Excel 2013 () SDI (Single Document Interface) Excel 2010 ( ) MDI (Multiple Document Interfaces) .

, Excel 2013 (SDI) Excel UI .



Excel 2010 Excel UI (MDI) .



VBA (2010 <-> 2013) .

Excel 2013 UI .

:

1. Excel , . (`Application.ActiveWindow` , `Application.Windows` ...)
2. Excel 2013 (SDI) , . `Application.Hwnd` .

MSDN .

. .

: https://riptutorial.com/ko/excel-vba/topic/1576/-

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