

Writing a macro (VBA)



A macro can be written inside a module. To insert a new module into a file right click on the file name in the project explorer, click on insert and select module. Double clicking on the last module created will open it. You may start writing your macro here.

VBA can be used to create

- 1) A Sub Procedure (Macro)
- 2) User Defined functions

Creating a sub procedure

A recorded macro is a sub procedure. Thus if you wish to have a macro like the one recorded (to be able to run it from the macro dialog box), you have to write the code in the sub block. The syntax of a sub block is as follows

Sub procedure_name()

End Sub

Procedure name must begin with a letter and cannot contain spaces. It can include letters, numbers, and underscores.

Types of procedures

There are two types of procedures: Sub and Function

Writing a Sub Procedure

A Sub procedure is a series of Visual Basic statements enclosed by the Sub and End Sub statements that performs actions but doesn't return a value. A Sub procedure can take arguments, such as constants, variables, or expressions that are passed by a calling procedure. If a Sub procedure has no arguments, the Sub statement must include an empty set of parentheses.

Syntax of Sub procedure

```
[Private | Public | Friend] [Static] Sub name [(arglist)]  
[statements]  
[Exit Sub]  
[statements]  
End Sub  
Example:
```

```
Sub SayHello()  
    MsgBox "Hello world!"  
End Sub
```

For example, given below are two procedures Uppcase and lowercase. They convert data in the selected cells to upper case and lowercase respectively.

```
Sub upCase()  
    For each cell In Selection  
        cell.Value = ucase(cell.Value)  
    Next  
End Sub
```

```
Sub lowercase()  
    For each cell In Selection  
        cell.Value = lcase(cell.Value)  
    Next  
End Sub
```

Tip: If you write Sub and the procedure name in a module and press enter, end sub comes automatically.

VBA Error Types

There are three types of VBA error that you may encounter when executing an Excel macro. These are:

- Compile Errors;
- Runtime Errors;
- Logical Errors ('bugs').

These three VBA error types are discussed in turn, below.

Compile Errors

Compile Errors are recognised by the VBA compiler as being illegal and therefore, are highlighted as errors before your macro even starts to run.

If you type in a syntax error, the VBA editor will immediately highlight this, either by popping up a message box or by highlighting the error in red, depending on the setting of the Auto Syntax Check option (see right).

Alternatively, a compile error may be detected when the code is compiled, just before being executed.

VBA Compile Error Message Box

A compile error is generally easy to fix, as the VBA compiler pops up a message box, which provides information on the nature of the error.

For example, if you get the message "Compile error: Variable not defined" when you attempt to run your code, this indicates that you are referencing a variable that has not been declared in the current scope. (This error is only generated when you are using Option Explicit).

Auto Syntax Check Option

The Auto Syntax Check option causes a message box to pop up whenever a syntax error is typed into the visual basic editor.

If this option is switched off, the visual basic editor still highlights syntax errors in red.

The Auto Syntax Check option is accessed by selecting Tools→Options from the menu at the top of the visual basic editor.

Runtime Errors

VBA Runtime Error Message Box

Runtime errors occur during the execution of your code, and cause the code to stop running. This type of VBA error is also usually relatively easy to fix, as you will be given details of the nature of the error, and shown the location where the code has stopped running.

For example, if your code attempts to divide by zero, you will be presented with a message box, which states "Run-time error '11': Division by zero".

Depending on the structure of your VBA project, you may be given the option to debug the code, (see below). In this case, clicking on the Debug button on the debug message box, causes the line of code that generated the VBA error to be highlighted in your vba editor.

If your code is more complex, you can gain further information on the reason for the VBA error by looking at the values of the variables in use. This can be done in the VBA editor by simply hovering your mouse cursor over the variable name, or by opening the local variables window (by selecting View→Locals Window).

The different runtime error codes are explained on the [Microsoft Support Website](#).

Logical Errors

Logical Errors, otherwise known as 'bugs', occur during the execution of the VBA code, and allow the code to continue to run to completion. However, the 'bug' may cause the macro to perform unexpected actions or return an incorrect result. These errors are the most difficult to detect and fix, as there is no way that the VBA compiler can identify and 'point to' the error, in the way that it does for compile and runtime errors.

For example, you may accidentally code your macro to add together the wrong variables in a procedure. The result would be incorrect, but the macro would (usually) continue to run to completion.

The Excel VBA editor provides a number of debugging tools to assist you in finding logical errors in your VBA code, so that they can be fixed. These tools are currently beyond the scope of this page. However, an introduction to debugging VBA is provided on the [TechOnTheNet Website](#).

Assigning a Macro to a Button

Having created macros using the discussed methods, there are several ways to run a macro. One of them is to assign a macro to a button in the Quick Access Toolbar. After assigning the macro to a button, you can run it by clicking that button.

To assign a macro to a button:

Click the options menu on the Quick Access Toolbar, and select Customize Quick Access Toolbar. The Application Settings dialog box opens with the Customization pane displayed. From the Available commands list, select Macros.

Select the macro to add to the toolbar and click Add >>. Click OK to close the Application Settings dialog box

Keyboard Shortcut List

Shortcut	Command
CTRL combination shortcut keys	
CTRL+SHFT+(Unhide any hidden rows within the selection.
CTRL+SHFT+)	Unhide any hidden columns within the selection.
CTRL+SHFT+&	Applies the outline border to the selected cells.
CTRL+SHFT_	Removes the outline border from the selected cells.
CTRL SHFT ~	Applies the General number format in Microsoft Excel.
CTRL+SHFT+\$	Applies the Currency format with two decimal places (negative numbers in parentheses).
CTRL+SHFT+%	Applies the Percentage format with no decimal places.
CTRL+SHFT+^	Applies the Exponential number format with two decimal places.
CTRL+SHFT+#	Applies the Date format with the day, month, and year.
CTRL+SHFT+@	Applies the Time format with the hour and minute, and AM or PM.
CTRL+SHFT+!	Applies the Number format with two decimal places, thousands separator, and minus sign (-) for negative values.
CTRL+SHFT+*	Selects the current region around the active cell (the data area enclosed by blank rows and blank columns). In a PivotTable, it selects the entire PivotTable report.
CTRL+SHFT+:	Enters the current time.
CTRL+SHFT+	Copies the value from the cell above the active cell into the cell or the Formula Bar.
CTRL SHFT Plus ()	Displays the Insert dialog box to insert blank cells in Microsoft Excel.
CTRL+Minus (-)	Displays the Delete dialog box to delete the selected cells.
CTRL+;	Enters the current date.
CTRL+`	Alternates between displaying cell values and displaying formulas in the worksheet.
CTRL+'	Copies a formula from the cell above the active cell into the cell or the Formula Bar.

CTRL+1	Displays the Format Cells dialog box.
CTRL+2	Applies or removes bold formatting.
CTRL+3	Applies or removes italic formatting.
CTRL 4	Applies or removes underlining in Microsoft Excel.
CTRL+5	Applies or removes strikethrough.
CTRL+6	Alternates between hiding objects, displaying objects, and displaying placeholders for objects.
CTRL+8	Displays or hides the outline symbols.
CTRL+9	Hides the selected rows.
CTRL 0	Hides the selected columns in Microsoft Excel.
CTRL+A	Selects the entire worksheet. If the worksheet contains data, CTRL+A selects the current region. Pressing CTRL+A, a second time selects the current region and its summary rows. Pressing CTRL+A a third time selects the entire worksheet. When the insertion point is to the right of a function name in a formula, displays the Function Arguments dialog box. CTRL+SHFT+A, inserts the argument names and parentheses when the insertion point is to the right of a function name in a formula.
CTRL+B	Applies or removes bold formatting.
CTRL+C	Copies the selected cells. CTRL+C followed by another CTRL+C, displays the Clipboard.
CTRL+D	Uses the Fill Down command to copy the contents and format of the topmost cell of a selected range into the cells below.
CTRL+F	Displays the Find and Replace dialog box, with the Find tab selected. While SHFT+F5 also display this tab, SHFT+F4, repeats the last Find action. CTRL+SHFT+F, opens the Format Cells dialog box with the Font tab selected.
CTRL+G	Displays the Go To dialog box. F5 also displays this dialog box.
CTRL+H	Displays the Find and Replace dialog box, with the Replace tab selected.
CTRL I	Applies or removes italic formatting in Microsoft Excel.
CTRL+K	Displays the Insert Hyperlink dialog box for new hyperlinks or the Edit Hyperlink dialog box for selected existing hyperlinks.
CTRL + L	Converts Range table into an Excel Table. CTRL + T (same task)
CTRL+N	Creates a new, blank workbook.
CTRL O	Displays the Open dialog box to open or find a file. CTRL SHFT O selects all cells that contain comments in Microsoft Excel.
CTRL+P	Displays the Print dialog box. CTRL+SHFT+P, opens the Format Cells dialog box with the Font tab selected.

CTRL+R	Uses the Fill Right command to copy the contents and format of the leftmost cell of a selected range into the cells to the right.
CTRL+S	Saves the active file with its current file name, location, and file format.
CTRL T	Converts Range table into an Excel Table.
CTRL+U	Applies or removes underlining. CTRL+SHFT+U switches between expanding and collapsing of the formula bar.
CTRL+V	Inserts the contents of the Clipboard at the insertion point and replaces any selection. Available only after you have cut or copied an object, text, or cell contents.
CTRL+W	Closes the selected workbook window.
CTRL+X	Cuts the selected cells.
CTRL Y	Repeats the last command or action, if possible in Microsoft Excel.
CTRL+Z	Uses the Undo command to reverse the last command or to delete the last entry that you typed. CTRL+SHFT+Z, uses the Undo or Redo command to reverse or restore the last automatic correction when AutoCorrect Smart Tags are displayed.
Function keys	
F1	Displays the Microsoft Office Excel Help task pane. CTRL+F1 displays or hides the Ribbon, a component of the Microsoft Office Fluent user interface. ALT+F1 creates a chart of the data in the current range. ALT+SHFT+F1, inserts a new worksheet.
F2	Edits the active cell and positions the insertion point at the end of the cell contents. It also moves the insertion point into the Formula Bar when editing in a cell is turned off. SHFT+F2, adds or edits a cell comment. CTRL+F2, displays the Print Preview window.
F3	Displays the Paste Name dialog box. SHFT+F3, displays the Insert Function dialog box.
F4	Repeats the last command or action, if possible. CTRL+F4, closes the selected workbook window.
F5	Displays the Go To dialog box. CTRL F5 restores the window size of the selected workbook window in Microsoft Excel.
F6	Switches between the worksheet, Ribbon, task pane, and Zoom controls. In a worksheet that has been split (View menu, Manage This Window, Freeze Panes, Split Window command), F6 includes the split panes when switching between panes and the Ribbon area. SHFT+F6 switches between the worksheet, Zoom controls, task pane, and Ribbon. CTRL+F6 switches to the next workbook window when more than one workbook window is open.
F7	Displays the Spelling dialog box to check spelling in the active worksheet or selected range. CTRL+F7, performs the Move command on the workbook window when it is not maximized. Use the arrow keys to move the window, and when finished, press ENTER, or ESC to cancel.

F8	Turns extend mode on or off. In extend mode, Extended Selection appears in the status line, and the arrow keys extend the selection. SHFT+F8, enables you to add a nonadjacent cell or range to a selection of cells by using the arrow keys. CTRL+F8 performs the Size command (on the Control menu for the workbook window) when a workbook is not maximized. ALT+F8 displays the Macro dialog box to create, run, edit, or delete a macro.
F9	Calculates all worksheets in all open workbooks. SHFT F9 calculates the active worksheet in Microsoft Excel. CTRL ALT F9 calculates all worksheets in all open workbooks, regardless of whether they have changed since the last calculation. CTRL ALT SHFT F9 rechecks dependent formulas, and then calculates all cells in all open workbooks, including cells not marked as needing to be calculated. CTRL F9 minimizes a workbook window to an icon.
F10	Turns key tips on or off. SHFT F10 displays the shortcut menu for a selected item in Microsoft Excel. ALT SHFT F10 displays the menu or message for a smart tag. If more than one smart tag is present, it switches to the next smart tag and displays its menu or message. CTRL F10 maximizes or restores the selected workbook window.
F11	Creates a chart of the data in the current range. SHFT+F11, inserts a new worksheet. ALT+F11 opens the Microsoft Visual Basic Editor, in which you can create a macro by using Visual Basic for Applications (VBA).
F12	Displays the Save As dialog box.

Other useful shortcut keys	
ARROW KEYS	Move one cell up, down, left, or right in a worksheet. CTRL+ARROW KEY moves to the edge of the current data region (data region: A range of cells that contains data and that is bounded by empty cells or datasheet borders.) in a worksheet. SHFT+ARROW KEY, extends the selection of cells by one cell. CTRL+SHFT+ARROW KEY extends the selection of cells to the last nonblank cell in the same column or row as the active cell, or if the next cell is blank, extends the selection to the next nonblank cell
BACKSPACE	Deletes one character to the left in the Formula Bar in Microsoft Excel. Also clears the content of the active cell. In cell editing mode, it deletes the character to the left of the insertion point.
DELETE	Removes the cell contents (data and formulas) from selected cells without affecting cell formats or comments. In cell editing mode, it deletes the character to the right of the insertion point.
END	Moves to the cell in the lower-right corner of the window when SCROLL LOCK is turned on. Also selects the last command on the menu when a menu or submenu is visible. CTRL+END moves to the last cell on a worksheet, in the lowest used row of the rightmost used column. If the cursor is in the formula bar, CTRL+END, moves the cursor to the end of the text. CTRL+SHFT+END, extends the selection of cells to the last used cell on the worksheet (lower-right corner). If the cursor is in the formula bar, CT

ENTER	Completes a cell entry from the cell or the Formula Bar, and selects the cell below (by default). In a data form, it moves to the first field in the next record. Opens a selected menu (press F10 to activate the menu bar) or performs the action for a selected command. In a dialog box, it performs the action for the default command button in the dialog box (the button with the bold outline, often the OK button). ALT+ENTER starts a new line in the same cell. CTRL+ENTER fills the selected cell range
ESC	Cancels an entry in the cell or Formula Bar in Microsoft Excel. Closes an open menu or submenu, dialog box, or message window. It also closes full screen mode when this mode has been applied, and returns to normal screen mode to display the Ribbon and status bar again.
HOME	Moves to the beginning of a row in a worksheet. Moves to the cell in the upper-left corner of the window when SCROLL LOCK is turned on. Selects the first command on the menu when a menu or submenu is visible. CTRL+HOME moves to the beginning of a worksheet. CTRL+SHFT+HOME, extends the selection of cells to the beginning of the worksheet.
PAGE DOWN	Moves one screen down in a worksheet. ALT+PAGE DOWN moves one screen to the right in a worksheet. CTRL+PAGE DOWN, moves to the next sheet in a workbook. CTRL+SHFT+PAGE DOWN, selects the current and next sheet in a workbook.
PAGE UP	Moves one screen up in a worksheet. ALT+PAGE UP moves one screen to the left in a worksheet. CTRL+PAGEUP, moves to the previous sheet in a workbook. CTRL+SHFT+PAGEUP, selects the current and previous sheet in a workbook.
SPACEBAR	In a dialog box, performs the action for the selected button, or selects or clears a check box. CTRL+SPACEBAR, selects an entire column in a worksheet. SHFT+SPACEBAR, selects an entire row in a worksheet. CTRL+SHFT+SPACEBAR, selects the entire worksheet. If the worksheet contains data, CTRL+SHFT+SPACEBAR, selects the current region. Pressing CTRL+SHFT+SPACEBAR a second time selects the current region and its summary rows. Pressing CTRL+SHFT+SPACEBAR a third time selects the entire worksheet.
TAB	Moves one cell to the right in a worksheet. Moves between unlocked cells in a protected worksheet. Moves to the next option or option group in a dialog box. SHFT TAB moves to the previous cell in a worksheet or the previous option in a dialog box in Microsoft Excel. CTRL TAB switches to the next tab in dialog box. CTRL SHFT TAB switches to the previous tab in a dialog box.