

Excel Basic Macros



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1.0 hour

Macros	3
Moving Between Cells.....	3
Navigating using the keyboard	3
Navigating Using the Mouse and Keyboard	5
Keyboard Shortcuts.....	5
Record a Macro	6
Absolute vs Relative References	8
Stop Recording.....	9
Running a Macro	9
Create a Button	10
Editing a Macro	11
Personal Macro Workbook	11
VBA Code.....	11
Class Exercise	13



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Macros

In Microsoft Office, a macro is a list of instructions that can be executed from a single command. This tool is used to help automate repetitive tasks. Macros are recorded in the Visual Basic for Applications (VBA) programming language. In some programs like Microsoft Access, you have to provide the list of actions to perform, but programs like Word and Excel have a "learn as you go" approach. When you Record a Macro in Excel, the program will write the VBA code that contains every action you perform until you click Stop.

Every action includes any mistakes you make along the way, so planning the macro is essential to success. It's rare to have a perfect plan the first time through, and building a macro may take many trial and error attempts. Knowing the shortcuts of navigating in Excel can go a long way to a smooth Macro creation.

Moving Between Cells

Navigating using the keyboard

Enter Key

The **Enter** (sometimes called the Return) key will move the focus down one cell. If you are in **Edit** or **Enter** mode, Excel will accept changes and move down.

- Using the **Shift** key and the **Enter** key will move the focus up one cell.
- Using the **Ctrl** key and the **Enter** key will accept changes and remain on the current cell. This is the same as clicking the ✓ in front of the formula bar.
- Inside a selection **Ctrl-Enter** will fill in the contents of the cell being edited into every cell in the selection.
- Using the **Alt** key and the **Enter** key will put in a hard return; that is, it forces a cell to put text on a second line.

Tab Key

The **Tab** key moves the focus one cell to the right. If you are in **Edit** or **Enter** mode, Excel will accept changes and move right.

- Using the **Shift** key and the **Tab** will move the focus one cell left.
- Using the **Ctrl** key and the **Tab** will move you to another Workbook (another Excel file).
- Using the **Alt** key and the **Tab** will move you to another open program on your computer.

Page Up and Page Down Keys

The **Page Up** and **Page Down** keys will move the focus of the current cell to the last visible cell on the previous screen, that is, it moves down one "screenful" of cells.

- Using the **Ctrl** key and the **Page Up** or **Page Down** keys will move to the previous or next Worksheet, respectfully.
- Using the **Alt** key and the **Page Up** or **Page Down** keys moves a "screenful" left or right, respectively.

Arrow Keys

In **Ready** mode and in **Enter** mode the arrow keys will move in the direction they point: up, down, left and right by one cell, respectively.

- Using the **Shift** key and the arrows will select a range of cells as you move.
- Using the **Ctrl** key and the arrows will move the current cell to the edge of the current data region (where the data stops/starts).
- Using both the **Shift-Ctrl** and the arrows keys will select all the cells from the current cell to the edge of the current data region.

In **Edit** mode the arrow keys will move you up, down, left and right between the letters and lines within the cell (if you only have one line of text the up and down arrows have no effect).

- Using the **Shift** key and the arrows will select text in that direction
- Using the **Ctrl** key and the left and right arrows will move word by word
- **Shift-Ctrl** and the left and right arrows will select text, word by word

Home Key

In **Ready** and **Enter** mode the **Home** key moves to the first column within that row.

- Using the **Shift** key and the **Home** key will select from the current cell to the first column within that row.
- Using the **Ctrl** key and the **Home** key will move to the very top of your worksheet.
- **Shift-Ctrl-Home** will select from the current cell to the very top of the worksheet

In **Edit** mode the **Home** key moves to the beginning of the cell.

- Using the **Shift** key and the **Home** key will select from where the cursor is blinking to the beginning of the cell.

End Key

In **Ready** mode the **End** key turns on an **End** feature. You will see the "END" appear on the status bar. Once it's on, you can then press an arrow key and it will search in that direction for a change in the cell pattern (with/without data). A similar method can be used by simply using the **Ctrl** key and the directional arrow.

- **Ctrl-End** moves to the last working cell on the worksheet, which is the cell at the intersection of the right-most used column and the bottom-most used row (in the lower-right corner)
- **Shift-Ctrl-End** will select from the current cell to the last (working) cell on the spreadsheet

In **Edit** mode the **End** key moves to the end of the cell.

- Using the **Shift** key and the **End** key will select from where the cursor is blinking to the end of the cell.

Escape Key

The **Esc** (escape) key is the cancel button; if you are editing/entering data in a cell, escape will ignore any changes you have made and return you to the original data or blank cell. This is the same as clicking the **x** in front of the formula bar. **Esc** will close dialog boxes such as open, save as.

Navigating Using the Mouse and Keyboard

Shift-Click

If you use **Shift** key and the mouse you can select a range (a set of conjoining cells). Click where you want to start, hold down the **Shift** key and click where you want to stop. Every cell in between will be selected.

Ctrl-Click

If you use the **Ctrl** key and the mouse you can select various cells (skipping ones in between). You cannot use these for equations but you can apply formatting (i.e. change several cells to red text).

Keyboard Shortcuts

Macros can be assigned to a keyboard shortcut. It has to be a single letter, but upper case and lowercase are looked at differently. This gives us 52 shortcut possibilities. The macro shortcuts will replace the standard shortcuts. Remember, while you may not use a shortcut, other people may use them all the time. For example, sometimes I see Ctrl-I assigned to Insert, when it's usually *Italics*.

Ctrl-A – Select All (Once current range, twice entire worksheet)

Ctrl-B – Toggle Bold

Ctrl-C – Copy Selected Cells or Text

Ctrl-D – Fill down

Ctrl-E – Flash Fill

Ctrl-F – Find

Ctrl-G – Goto

Ctrl-H – Replace

Ctrl-I – Toggle Italics

Ctrl-J – *Unassigned*

Ctrl-K – Hyperlink

Ctrl-L – Create a Table

Ctrl-M – Move Table

Ctrl-N – New Workbook

Ctrl-O – Open Workbook

Ctrl-P – Print

Ctrl-Q – Quick Analysis

Ctrl-R – Fill to the right

Ctrl-S – Save

Ctrl-T – Create Table Dialog box

Ctrl-U – Toggle Underline

Ctrl-V – Paste

Ctrl-W – Close Workbook

Ctrl-X – Cut

Ctrl-Y – Redo/Repeat the last action

Ctrl-Z – Undo

Ctrl-Shift-A – inserts the argument names right of a function name in a formula

Ctrl-Shift-B – *Unassigned*

Ctrl-Shift-C – *Unassigned*

Ctrl-Shift-D – *Unassigned*

Ctrl-Shift-E – *Unassigned*

Ctrl-Shift-F – Format Cells dialog box - FONT

Ctrl-Shift-G – *Unassigned*

Ctrl-Shift-H – *Unassigned*

Ctrl-Shift-I – *Unassigned*

Ctrl-Shift-J – *Unassigned*

Ctrl-Shift-K – *Unassigned*

Ctrl-Shift-L – Toggle Filter

Ctrl-Shift-M – *Unassigned*

Ctrl-Shift-N – *Unassigned*

Ctrl-Shift-O – Selects all cells with Comments

Ctrl-Shift-P – Format Cells dialog box - FONT

Ctrl-Shift-Q – *Unassigned*

Ctrl-Shift-R – *Unassigned*

Ctrl-Shift-S – *Unassigned*

Ctrl-Shift-T – *Unassigned*

Ctrl-Shift-U – Expands/Collapses formula bar

Ctrl-Shift-V – *Unassigned*

Ctrl-Shift-W – *Unassigned*

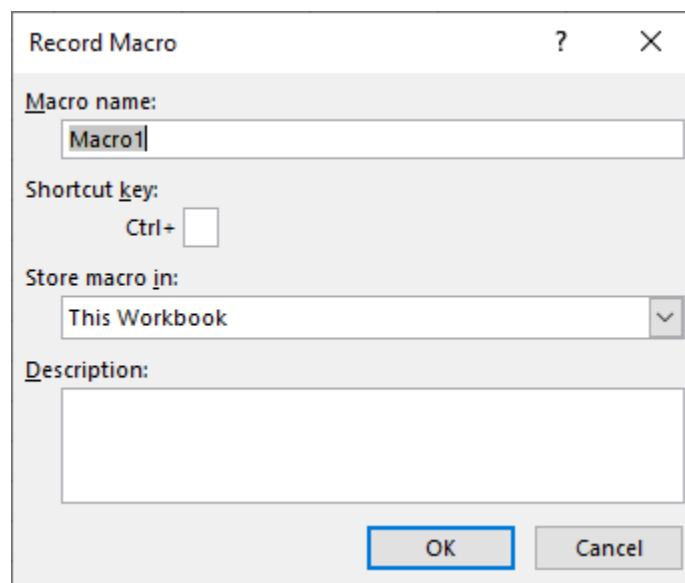
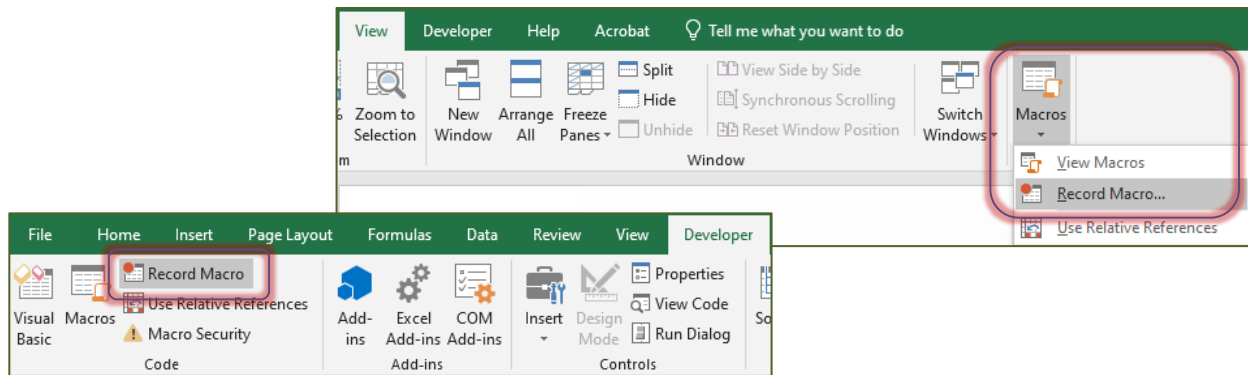
Ctrl-Shift-X – *Unassigned*

Ctrl-Shift-Y – *Unassigned*

Ctrl-Shift-Z – *Unassigned*

Record a Macro

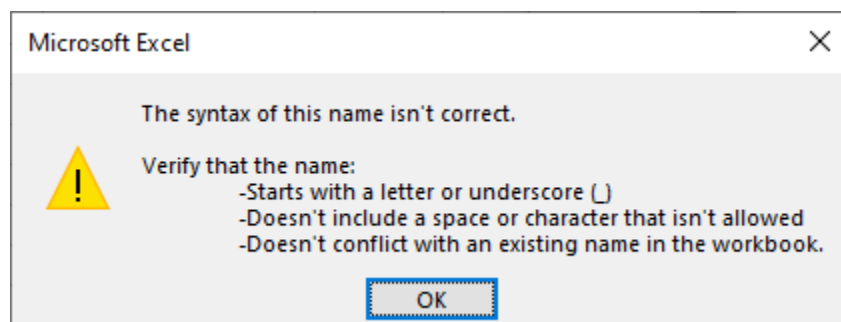
From the **View** tab, choose **Macros, Record Macro...**, or from the **Developer** tab, choose **Record Macro**.



The first step is to give your macro a descriptive name. You cannot use spaces, dashes, periods, or other special characters in your macro name. Common practice is to use Underscores (_) to represent spaces, or to use alternating capitalization (CamelCaps).

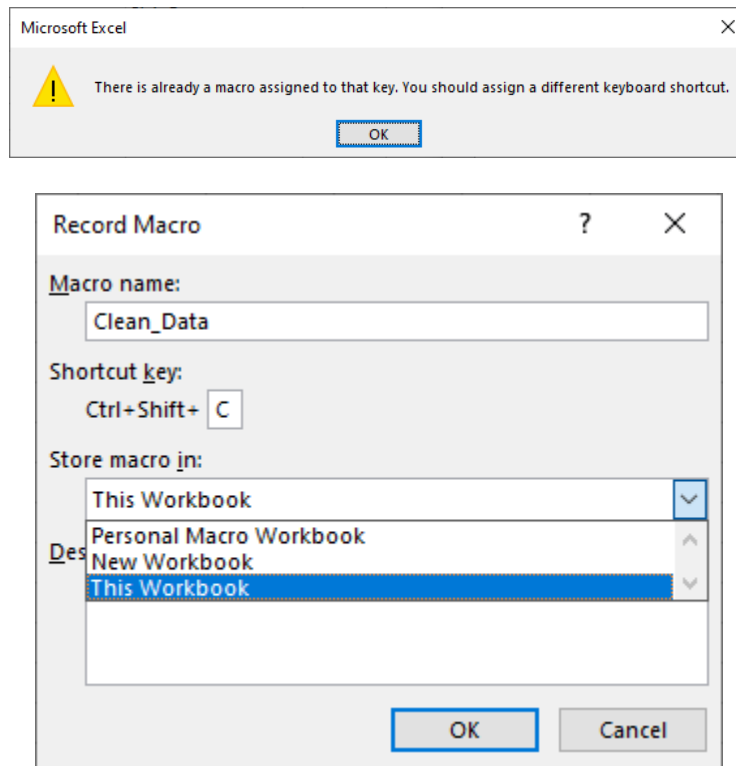
As this error message states, the name cannot already be assigned, and it must begin with a letter or underscore.

Print_This_Sheet ~ PrintThisSheet



Next is the **Shortcut Key**. This is optional, but if you'd like to create one, see the shortcut list earlier in this handout. Your keyboard shortcut will overwrite the preassigned ones. So if I decide to use Ctrl-C to "clean" my data, I will no longer be able to use Ctrl-C to Copy. Consider using the capital letters instead; Ctrl-Shift-C is unassigned. The Ctrl is already assumed here, so you would press Shift-C to assign the shortcut.

Excel will **not** warn you that the shortcut you chose is already assigned to a default shortcut, but it will if you have assigned it to another macro.



Next decide where to **store the macro**. The macro has to be assigned to a workbook. The personal Macro Workbook should make the macro accessible from any Excel file on your computer. Assigning it to another file will allow it to be portable, that is you can share the file with the macro attached and other people can use it while that file is open on their computer.

- **This Workbook** - This choice will attach this macro to the current Excel file, and it will only be accessible when this workbook is open.
- **New Workbook** - This choice will attach the macro to a new Excel file, and will only be accessible when *that* file is open.
- **Personal Macro Workbook** - This choice will attach the macro to the hidden Personal Macro Workbook. This file should be opened automatically in the background of Excel. This should make the macro accessible without having to open a saved file.

The **Description** is optional, but it's good practice to explain why this macro was created and what it is supposed to do. This is also a great place to put who created the macro and when it was recorded.

Absolute vs Relative References

We use absolute and relative references in building equations in Excel.

	A	B	C
1	Pay Raise	3%	
2			
3	Current Pay	Pay Increase	New Pay
4	\$35,000.00	=A4*\$B\$1	=A4+B4
5	\$42,000.00	=A5*\$B\$1	=A5+B5
6	\$87,000.00	=A6*\$B\$1	=A6+B6
7			

By default, when we build an equation, it's relative to its location. When we fill or copy the equation the cell references change. If we want to "lock" an address, like I did above in the Pay Increase, we add the \$ character to the address.

Sometime we need to mix and match the absolute and relative references.

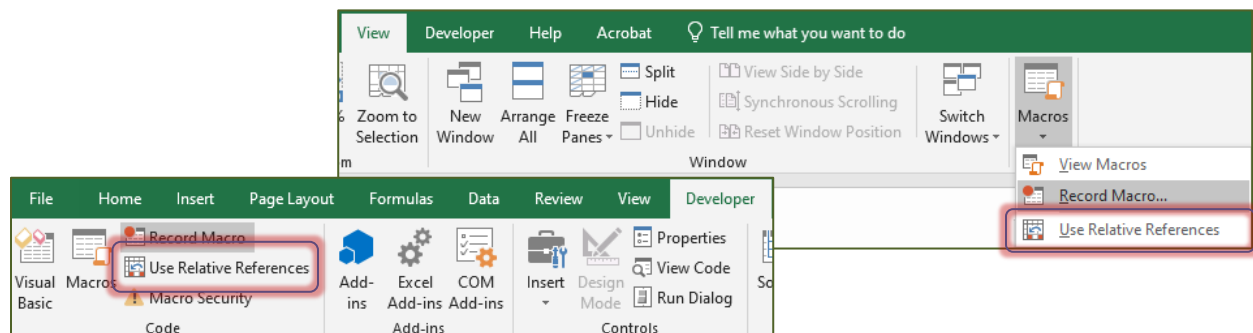
	A	B	C	D
1		1.0%	1.5%	2.0%
2				
3	Current Pay	1% Increase	1.5% Increase	2% Increase
4	\$35,000.00	=\$A4*B\$1	=\$A4*C\$1	=\$A4*D\$1
5	\$42,000.00	=\$A5*B\$1	=\$A5*C\$1	=\$A5*D\$1
6	\$87,000.00	=\$A6*B\$1	=\$A6*C\$1	=\$A6*D\$1
7				

If I create the equation in cell B4: **=\$A4*B\$1**, I can fill it down and across and get the correct formulas. It will keep an **absolute** Column A, and an absolute Row 1, but the other parts of the equation change to be **relative** to the row and column changes.

In a Macro

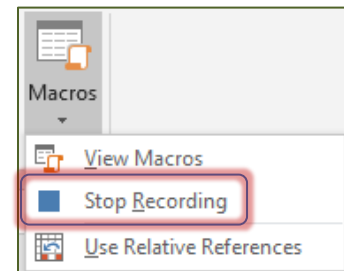
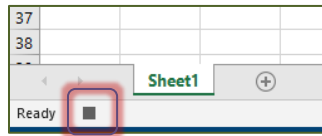
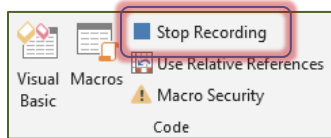
The Absolute vs Relative Reference in a macro behaves in a similar way. If I start the Macro in cell A1, and I click in cell B1, how should Excel record that? Do you mean **Absolute** - always go to cell B1, no matter where you start, or do you mean **Relative** - go one cell to the right? When you fill to the bottom of the list, do you mean Absolute - Fill A1:A4, or do you mean Relative - Current cell to the bottom of the existing list?

You can turn this option on and off on the **Macros** menu in the **View** tab, or the **Code** group of the **Developer** tab.



Stop Recording

Once you have started recording your macro, the **Record Macro** button on the **Developer** and **View** tabs will change to say **Stop Recording**.



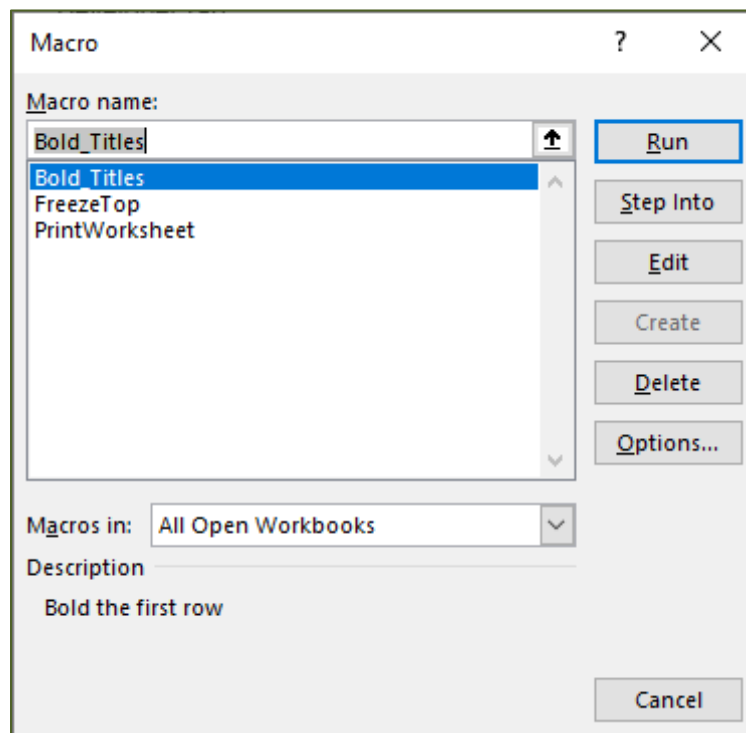
A **Stop Recording** button will also appear in the status bar at the bottom of the window. Click on any of the square buttons to "Stop" recording.

The only indication that Excel has stopped following you is these buttons will go away.

Running a Macro

Open the **Macro** window using the Macros button on the **View** tab, or the **Developer** tab.

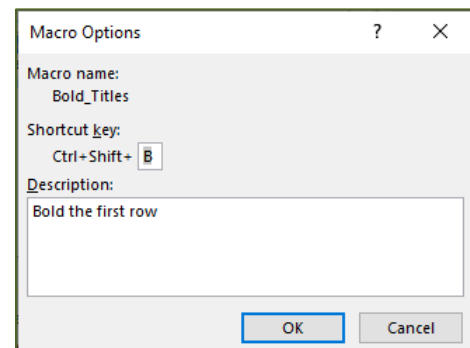
Choose the Macro you want, and click the **Run** button.



If you assigned a keyboard shortcut, you can press that key sequence to run your macro.

You can assign a keyboard shortcut after the macro is created. From this window, choose the macro and click on the **Options** button.

You can also create a button to run the macro.

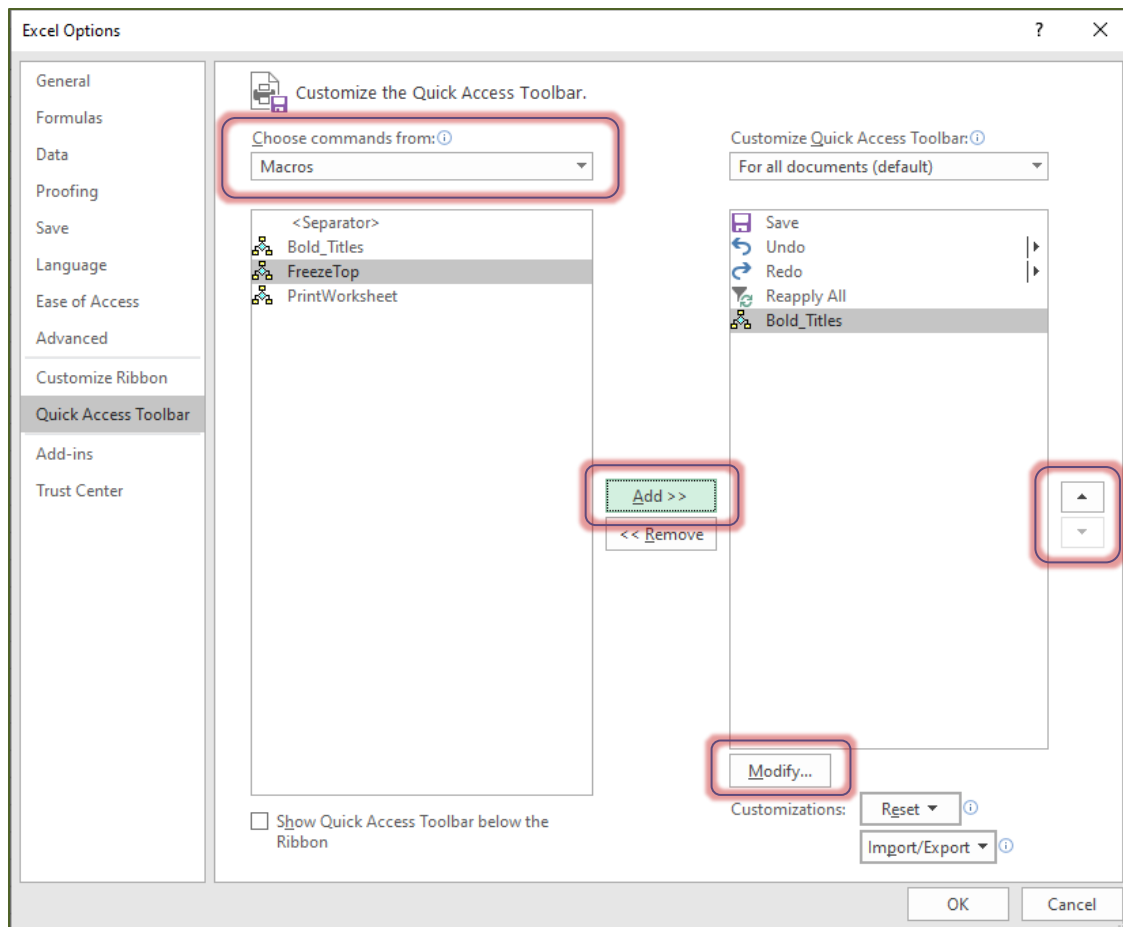


Create a Button

You can create a button to run your Macro for the Ribbon or the Quick Access Toolbar. Open the **Excel Options** from the bottom of the File men, or by right clicking on a tab in the **Ribbon** and choosing **Customize**.

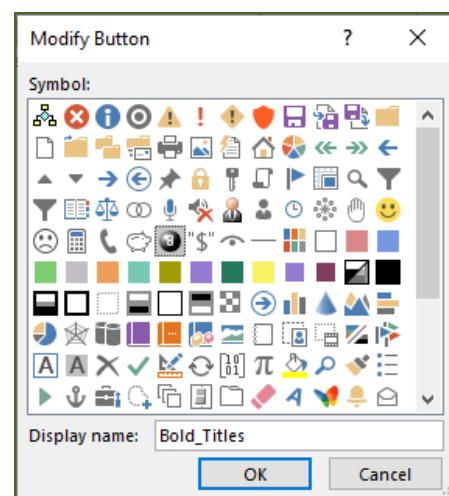
Change the **Choose commands from:** option to Macros.

Select the Macro you want and click the **Add** button. If you are customizing the Ribbon, you will need to choose a tab



Use the Up and Down arrows on the side to rearrange the order of the buttons

Use the **Modify** button to change the shape of the button.



Editing a Macro

Open the Macros window from the View tab or Developer tab.

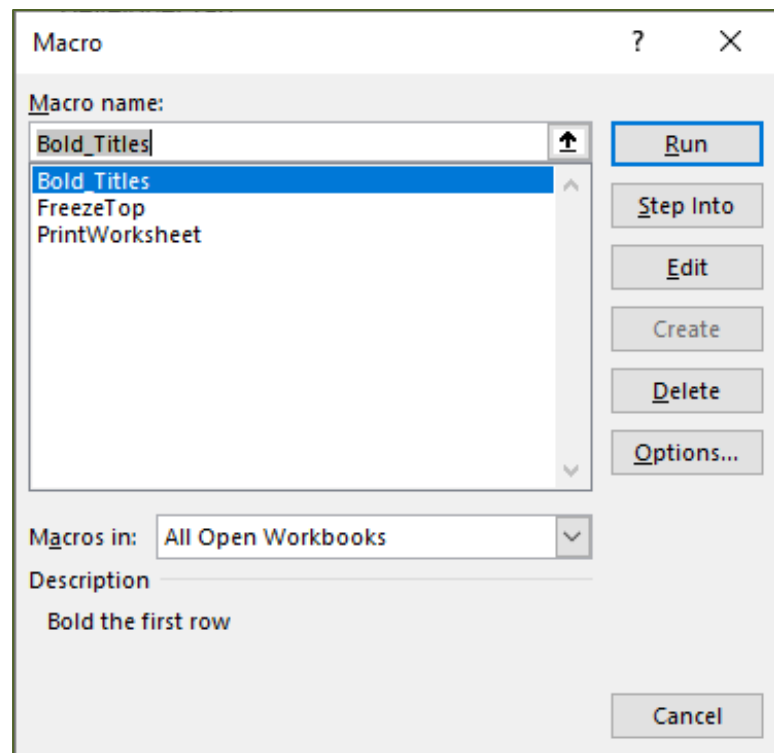
Click on the Macro name and click the **Edit** button.

Personal Macro Workbook

If the file is in the Personal Macro workbook you will not be able to edit the macro until you unhide the file.

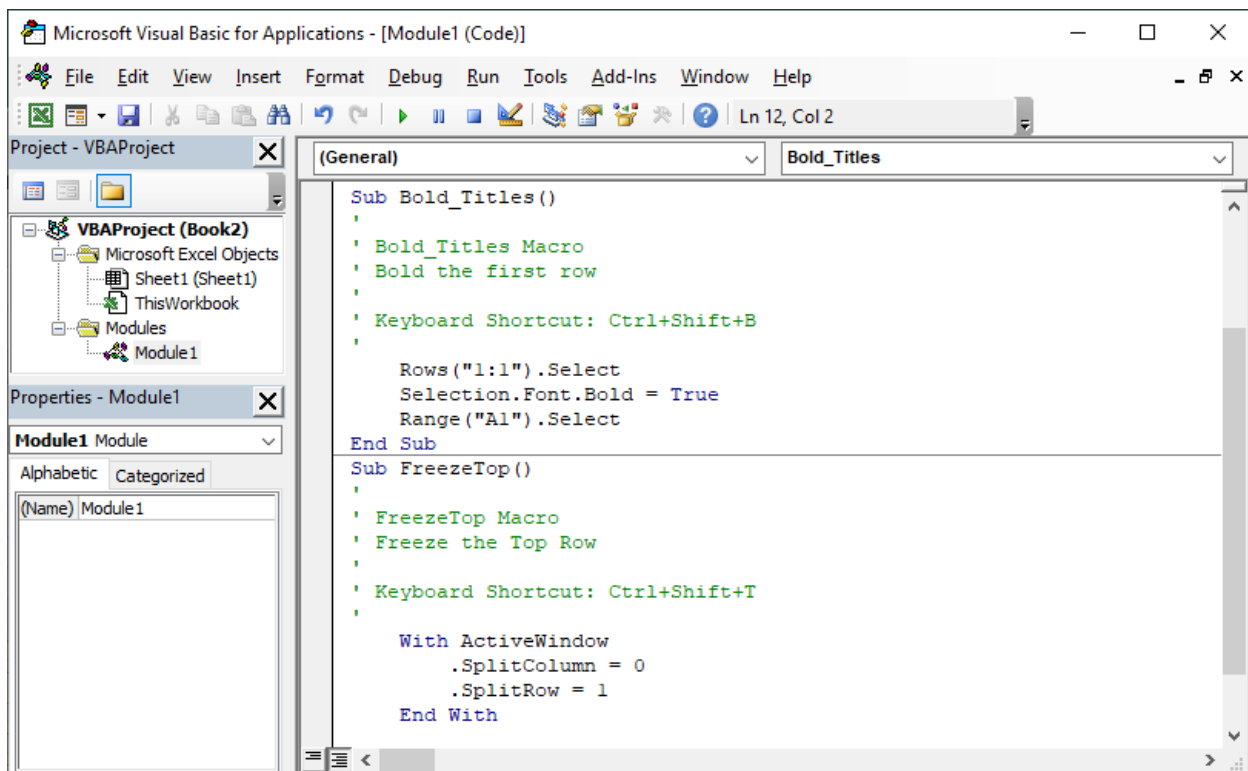
From the View tab, choose Unhide (it's next to Freeze Panes). *Don't forget to hide the file again before you exit Excel.*

To avoid the unhide/hide issue, I usually click the **Step Into** button.



VBA Code

As you record your Macro, Excel writes the Visual Basic for Applications (VBA) code. When you **Edit** or **Step Into** the macro, Excel will show you the VBA Code. I'm not going to teach you VBA, but I will offer some tricks that might help.



Helpful Hints

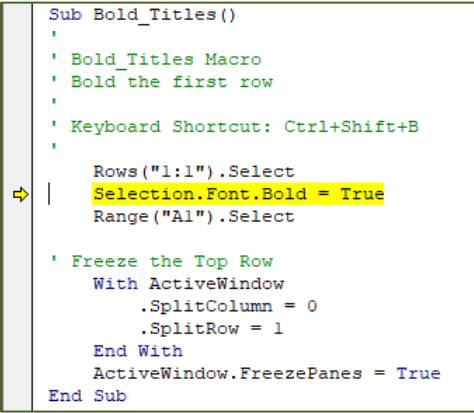
1. Place a single quote (') in front of a line of code to "comment" it out, this means this line will not run. It's also a nice way to add notes to each section of your macro.
2. Macros begin with SUB, and stop with END SUB. Sometimes it's useful to combine macros. Perhaps you forgot a step, you can create a temporary macro, do the step. Stop the recording, and edit/step into the code, copy and paste it into the other macro.

For example, the macros on the previous page, bold first row and Freeze top row, can be combined by deleting the close macro in Bold_Titles (End Sub) and the opening of FreezeTop (Sub FreezeTop()).

```
Sub Bold_Titles()  
'  
' Bold_Titles Macro  
' Bold the first row  
'  
' Keyboard Shortcut: Ctrl+Shift+B  
'  
    Rows("1:1").Select  
    Selection.Font.Bold = True  
    Range("A1").Select  
  
' Freeze the Top Row  
    With ActiveWindow  
        .SplitColumn = 0  
        .SplitRow = 1  
    End With  
    ActiveWindow.FreezePanes = True  
End Sub
```

3. To Delete a macro from this window, select the Sub to End Sub, and press delete or backspace.
4. To Rename a Macro, change the text next to Sub at the top of the code.
5. "Step Into" lets you run the code one line at a time. You can find the option under the Debug menu, or use the keyboard shortcut - function key **F8**.

Rearrange the windows on your screen to show Excel and the VBA Code at the same time. In the VBA window, press F8 and watch the Excel Window as Excel runs the code one line at a time, with each "step into" action. Excel will highlight the line that will be run with the next Step Into.



```
Sub Bold_Titles()  
'  
' Bold_Titles Macro  
' Bold the first row  
'  
' Keyboard Shortcut: Ctrl+Shift+B  
'  
    Rows("1:1").Select  
    Selection.Font.Bold = True  
    Range("A1").Select  
  
' Freeze the Top Row  
    With ActiveWindow  
        .SplitColumn = 0  
        .SplitRow = 1  
    End With  
    ActiveWindow.FreezePanes = True  
End Sub
```

6. When in doubt, throw it out. Sometimes it's just easier to delete the macro and remake it.
7. PLAN your macro. Remember that Excel records everything you do, including the mistakes. Feel free to contact me to help with simple macros.
8. Microsoft Help: [Run a macro - Office Support \(microsoft.com\)](https://support.microsoft.com/en-us/topic/run-a-macro-1693083d-11e0-461d-9987-79d6926d30c2)

Class Exercise

Open Excel

Discuss Personal.xls vs. This Workbook

Open KRats01.txt, click Finish

Record New Macro

- View Tab -> Macros -> Record Macro
 - o Name: CleanRat
 - o Save in personal.xls
- Select Column B, Format Date
- Select Column D, Format number one decimal
- Select Row 1, Bold
- Select All, Autofit Columns
- Control-Home
- STOP
- Close without saving

Test Macro

- Open KRats01.txt, click Finish
- Run the Macro

Make a Button

- Customize Quick Access Toolbar
- More Commands
- Choose Commands From: Macros
- Find your macro
- Add >>
- Select the Macro
- Modify... Button at the bottom of the pane

Test button

- Open KRats02.txt, click Finish
- Run the Macro
- Open KRats03.txt, click Finish
- Run the Macro
- Close All without saving

Remove Button

- Right-click on button to remove from quick access toolbar

Delete Macro

- View Tab ->Macro->View Macros
- Try to delete CleanRat
- Click ok to error, and cancel

- View Tab -> Windows->Unhide->Personal.xls
- Tools->Macro->Macros

-
- Delete CleanRat
 - Windows->Hide

Create a new Worksheet

Talk about moving around excel using the keyboard.

- Practice with Ctrl arrows
- Practice with Shift-Ctrl arrows

Turn on Developer Tab

- Right-click on the ribbon
- Choose Customize Ribbon
- Turn on checkbox for Developer

Create new macro

- Developer Tab -> Record Macro
 - o Macro Name: **Test**
 - o Shortcut Key: **Ctrl-q**
 - o Store Macro in: **This Workbook**
- B2: abc – blue
- C3: def – red
- D4: 123 – green
- STOP

Run Macro

- Move to Sheet 2
- Run Macro twice (ctrl-q)
- Move to Sheet 3
- Run Macro (ctrl-q)

Close and don't save the file.

Create new macro

- Developer Tab -> Record Macro
 - o Macro Name: **Test**
 - o Shortcut Key: **Ctrl-q**
 - o Store Macro in: **This Workbook**
- Developer Tab: **USE RELATIVE REFERENCES**
- B2: abc – blue
- C3: def – red
- D4: 123 – green
- STOP

Run Macro

- Move to Sheet 2
- Run Macro three times (ctrl-q)

Close and don't save the file.

Open Customers.xls

Create Macro

- Click on Worksheet K
- Tools->Macro->Record New Macros...
 - o Name: Consolidate
 - o Save in this Workbook
 - o assign Ctrl-q
- relative off
- Ctrl Home
- down one cell, shift-ctrl-down, shift-ctrl-right
- copy
- Click on Sheet J
- Ctrl-Home
- Ctrl-down
- down
- paste
- Ctrl-Home
- STOP

Test macro

- Click on Worksheet L
- Ctrl-q
- Click on Worksheet M
- Ctrl-q

Close without saving

Open Customers.xls

Create Macro

- Click on Worksheet K
- New Macro
 - o Name: Consolidate
 - o Save in this Workbook
 - o assign Ctrl-w
- **Use Relative References**
- Ctrl Home
- down one cell, shift-ctrl-down, shift-ctrl-right
- copy
- Click on Sheet J
- Ctrl-Home
- Ctrl-down
- down
- paste
- Ctrl-Home
- STOP

Test macro

- Click on Worksheet L, Ctrl-q
- Click on Worksheet M, Ctrl-q