

COMP1022Q

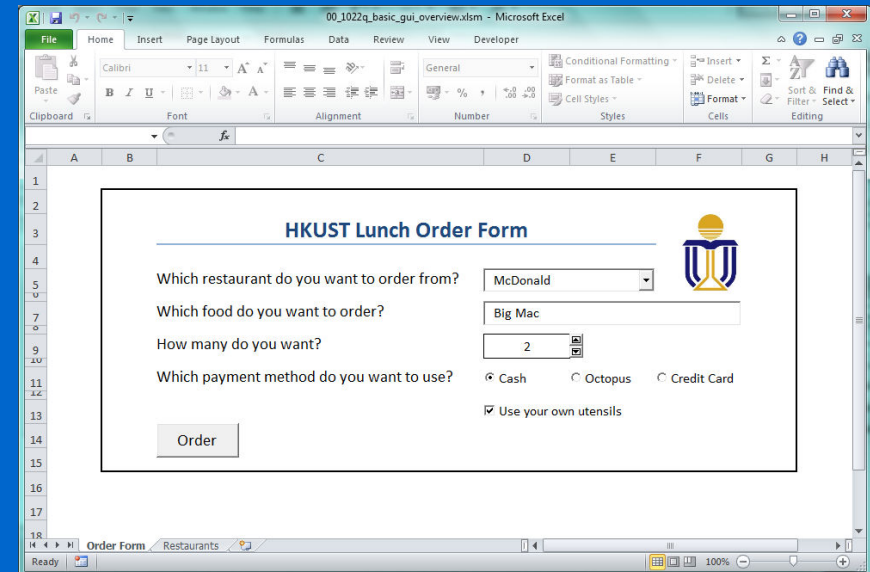
Introduction to Computing with Excel VBA

# Basic GUI Controls

Gibson Lam, David Rossiter and Eddie Chan

# What is a GUI?

- A graphical user interface (GUI) is a set of visual elements that a user can interact with
- An example GUI is shown on the right
- For Excel, some of the GUI elements you can use are shown on the next two slides



# Examples of GUI Components (1/2)

Text Box

Big Mac

Labels

Which restaurant do you want to order from?

Combo Box

McDonald's  
Cha Chaan Teng  
Baguettes II  
McDonald's  
Asia Pacific Catering  
Gold Rice Bowl  
Milano Fresh  
UC Bistro  
Seafront Cafeteria

Image Control



**HKUST Lunch Order Form**

Which restaurant do you want to order from? McDonald's

Which food do you want to order? Big Mac

How many do you want? 1

Which payment method do you want to use? ☒ Cash ☐ Octopus ☐ Credit Card

☒ Use your own utensils

Order

# Examples of GUI Components (2/2)

**HKUST Lunch Order Form**

Which restaurant do you want to order from?

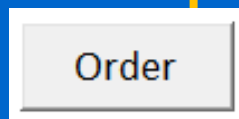
Which food do you want to order?

How many do you want?

Which payment method do you want to use? ☒ Cash ☐ Octopus ☐ Credit Card

☒ Use your own utensils

Button



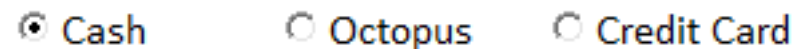
Spin Button



Check Box



Option Buttons



# Excel GUI Events

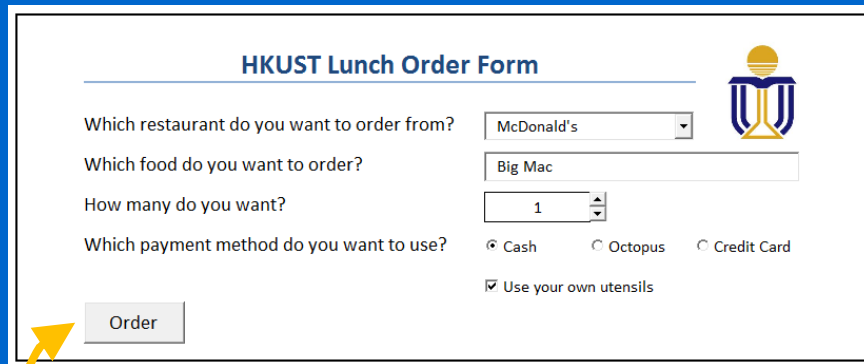
- We have worked on how to handle events in a worksheet or a workbook in the labs
- Similar to that, we can write some VBA code to handle events created when a user does something with a GUI component
- For example, doing all these will trigger an event:
  - Clicking a button
  - Changing the value in a combo box
  - Changing the text of a text box

# How to Build an Excel GUI System

- First, create all the required GUI components using the Excel GUI panel, i.e.
  - Add the GUI components such as buttons and text boxes
  - Set up the properties of the components like:
    - Basic data such as name and displayed text
    - Visual style such as font color and size
    - Event handlers
- Then write the VBA code for the event handlers of the GUI components

# Building an Excel GUI System

- Step 1 – Create the GUI display using the GUI components



HKUST Lunch Order Form

Which restaurant do you want to order from? McDonald's

Which food do you want to order? Big Mac

How many do you want? 1

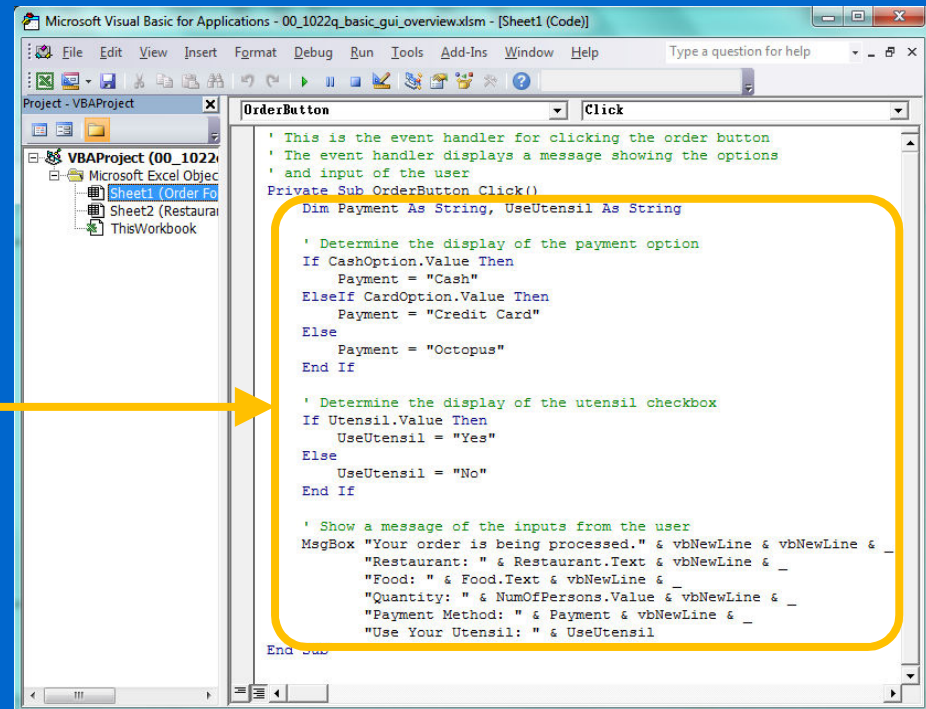
Which payment method do you want to use? ☒ Cash ☐ Octopus ☐ Credit Card

☒ Use your own utensils

Order

This is the event handler  
of the 'Click' event of  
the 'Order' button

- Step 2 – Write the VBA code for the event handlers



```
' This is the event handler for clicking the order button
' The event handler displays a message showing the options
' and input of the user
Private Sub OrderButton_Click()
    Dim Payment As String, UseUtensil As String

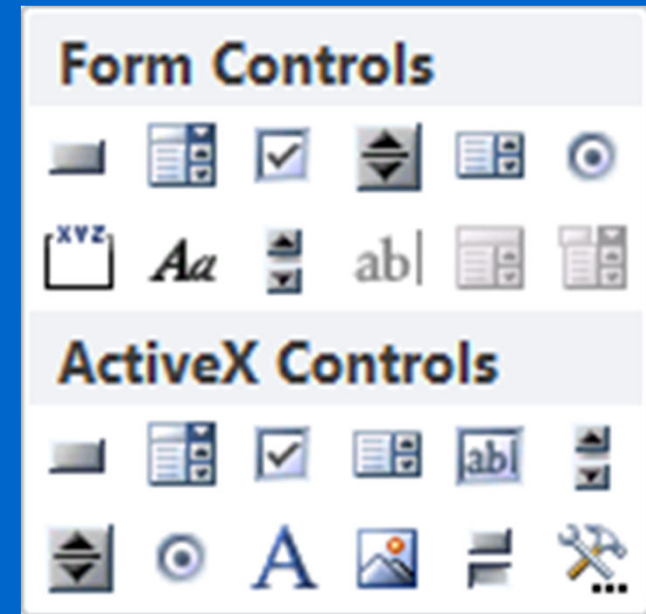
    ' Determine the display of the payment option
    If CashOption.Value Then
        Payment = "Cash"
    ElseIf CardOption.Value Then
        Payment = "Credit Card"
    Else
        Payment = "Octopus"
    End If

    ' Determine the display of the utensil checkbox
    If Utensil.Value Then
        UseUtensil = "Yes"
    Else
        UseUtensil = "No"
    End If

    ' Show a message of the inputs from the user
    MsgBox "Your order is being processed." & vbNewLine & vbNewLine & _
        "Restaurant: " & Restaurant.Text & vbNewLine & _
        "Food: " & Food.Text & vbNewLine & _
        "Quantity: " & NumOfPersons.Value & vbNewLine & _
        "Payment Method: " & Payment & vbNewLine & _
        "Use Your Utensil: " & UseUtensil
End Sub
```

# Excel GUI Components

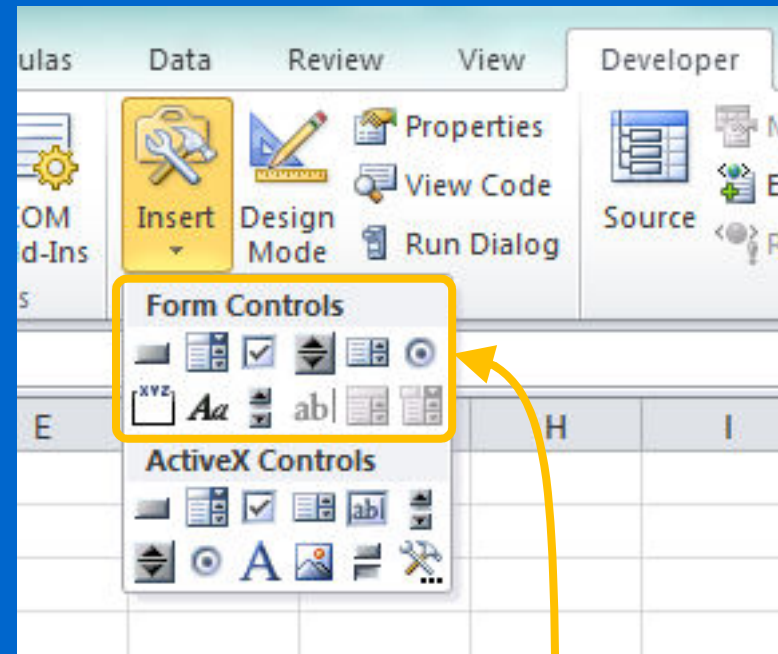
- The Excel GUI panel has all sorts of GUI components such as buttons, combo boxes, option buttons that can be added to a worksheet
- These GUI components are divided into two categories:
  - Form Controls
  - ActiveX Controls
- The two categories of controls are very similar but they have some important differences





# Form Controls

- Any VBA code can be run from a Form control
- Most of the Form controls do not allow any change of their visual style such as font and color
- Form controls can only handle a few events such as the click and the change events

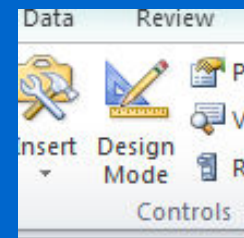
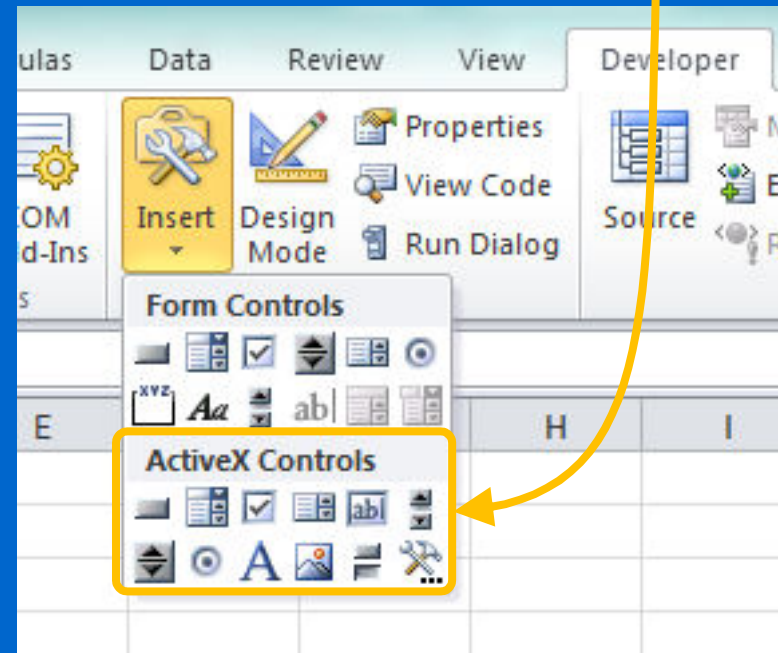


Form controls

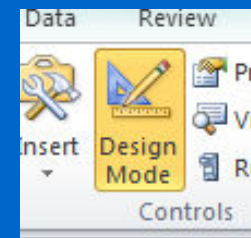
# ActiveX Controls

ActiveX  
controls

- Similar to Form controls any VBA code can be run from ActiveX controls
- ActiveX controls provide greater flexibility than Form controls
- For example, their visual style can be easily changed and they can handle various events
- However, to change any ActiveX controls the GUI panel has to be in *Design Mode*



Design  
mode off



Design  
mode on

# GUI Components in This Presentation

- For the rest of this presentation we will focus on the use of three basic GUI components:

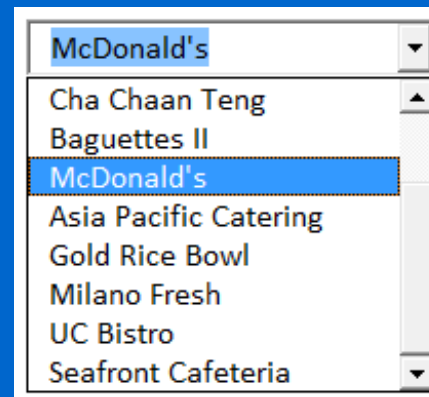
Label

Which restaurant do you want to order from?

Button

Order

Combo Box



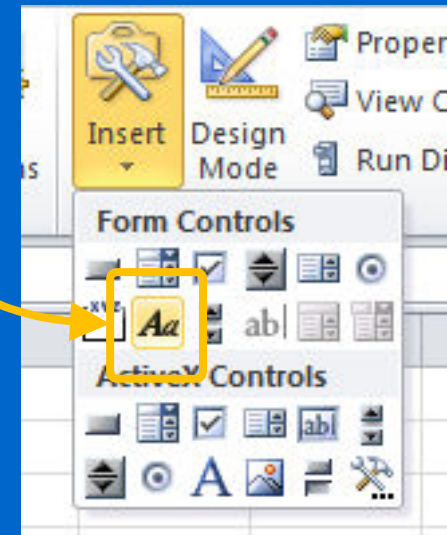
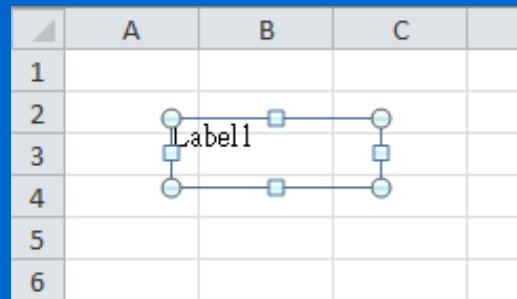
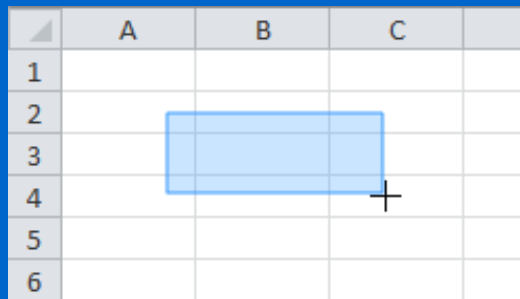
- We will show these three components using both Form controls and ActiveX controls

# The Rest of This Presentation

- In the rest of this presentation we will look at these things:
  - Creating a label Form control
  - Creating a label ActiveX control
  - Creating a button Form control
  - Creating a button ActiveX control
  - Creating a combo box Form control
  - Creating a combo box ActiveX control

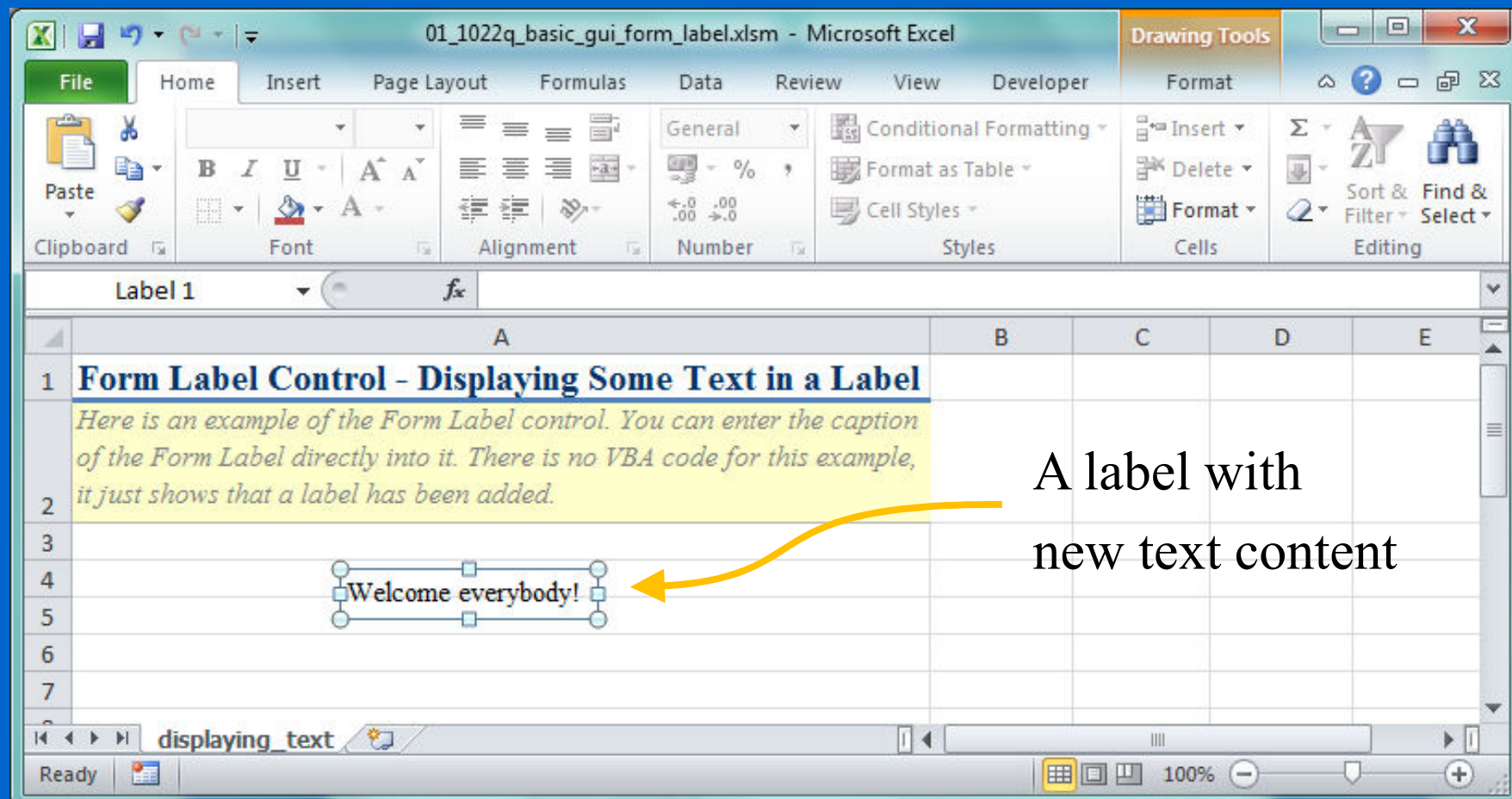
# Creating a Label Form Control 1/2

- To add a label Form control we select the label Form control icon
- Then we click and drag the label at the location we want to put it, like this:



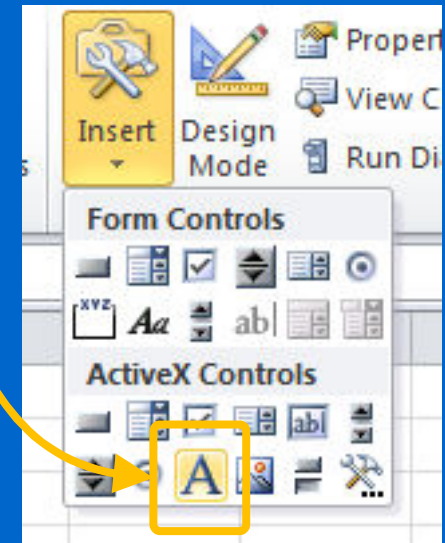
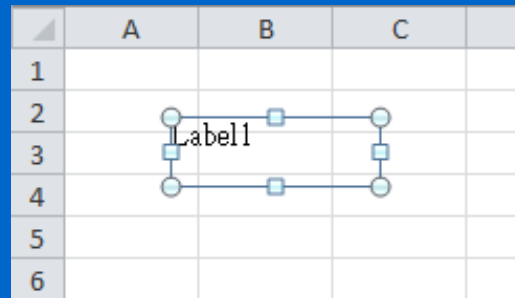
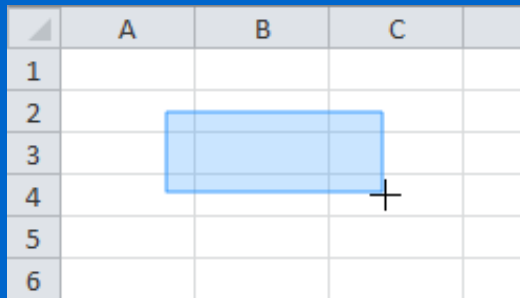
# Creating a Label Form Control 2/2

- After adding the label we can then double-click on the label to change the text content, like this:



# Creating a Label ActiveX Control 1/4

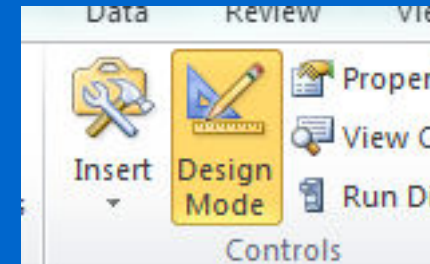
- To add a label ActiveX control we select the label ActiveX control icon
- Then we click and drag the label at the location we want to put it, like this:





# Creating a Label ActiveX Control 2/4

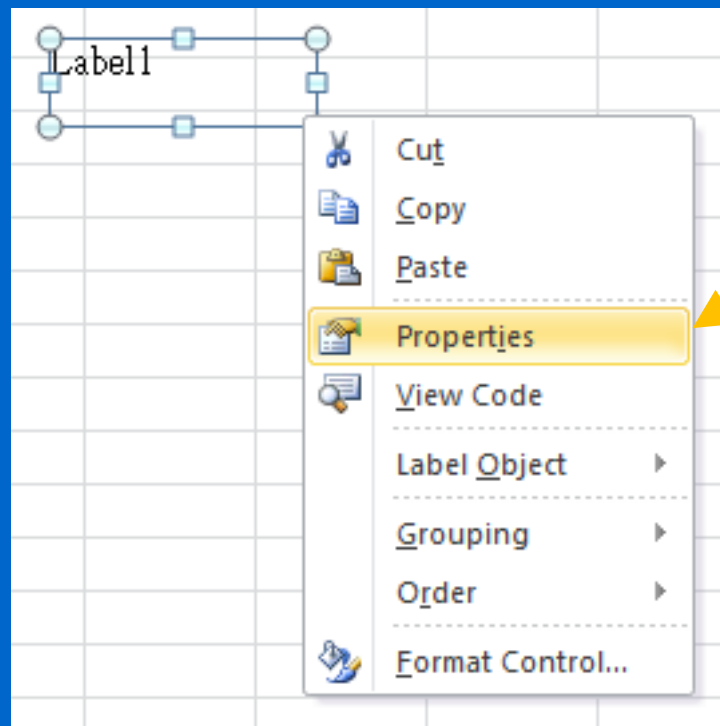
- When we add an ActiveX control Excel will automatically switch to *Design mode*
- After the label is added on the worksheet we can change the text content of the label by doing these:
  - Right-click on the label to bring up a pull-down menu
  - In the pull-down menu select 'Properties' to show the properties window of the label
  - Change the text content in the 'Caption' property



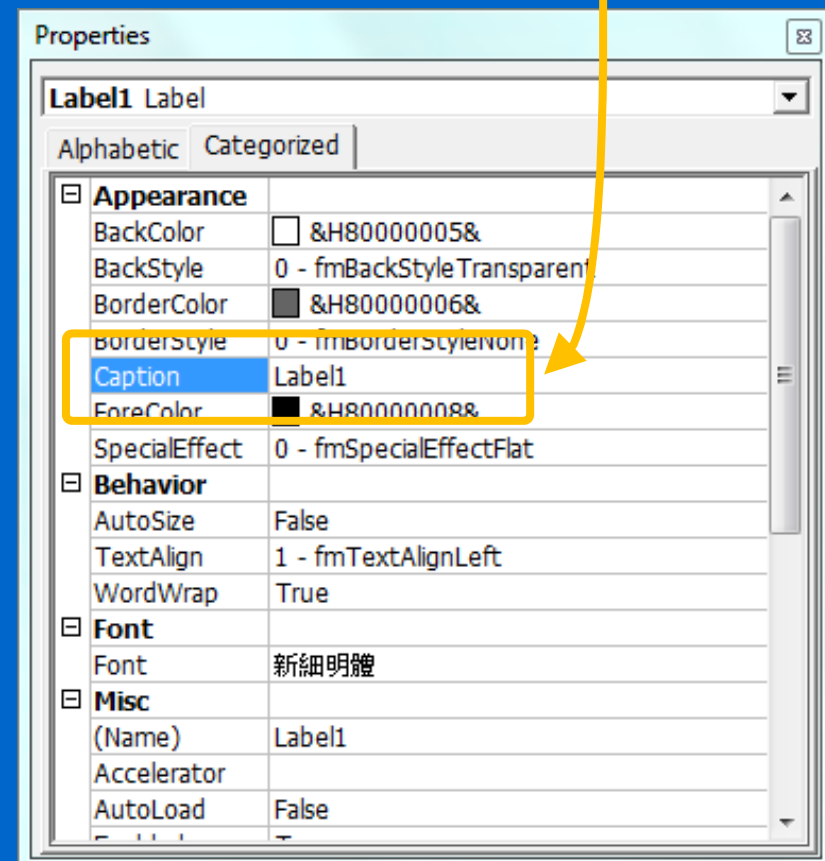


# Creating a Label ActiveX Control 3/4

Bring up the pull-down menu and select 'Properties'



Change the text content of the label using the 'Caption' property



# Creating a Label ActiveX Control 4/4

- By changing the 'Caption' property we can see the display of the label changed accordingly, like this:

1 **ActiveX Label Control - Displaying Some Text in a Label**

2 *Here is an example of the ActiveX Label control. You can set the ActiveX Label in the 'Properties' window. There is no code example, it just shows that a label has been added. To modify control, you need to select Developer -> Design Mode.*

3

4 Welcome everybody!

5

6

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11

12 In this example, the

13 font of the label has

14 been changed

15

16

17

18

19

**Properties**

Label1 Label

Alphabetic Categorized

**Appearance**

BackColor ☐ &H80000005&

BackStyle 1 - fmBackStyleOpaque

BorderColor ☒ &H80000006&

BorderStyle 0 - fmBorderStyleNone

Caption Welcome everybody!

ForeColor ☒ &H80000008&

SpecialEffect 0 - fmSpecialEffectFlat

**Behavior**

AutoSize False

TextAlign 1 - fmTextAlignLeft

WordWrap True

**Font**

Font Calibri

**Misc**

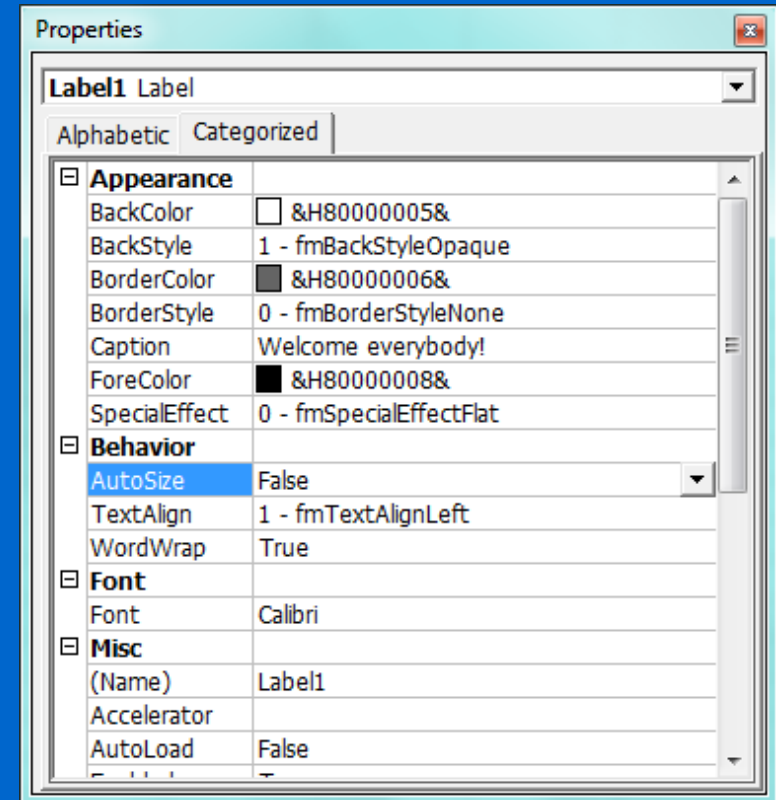
(Name) Label1

Accelerator

AutoLoad False

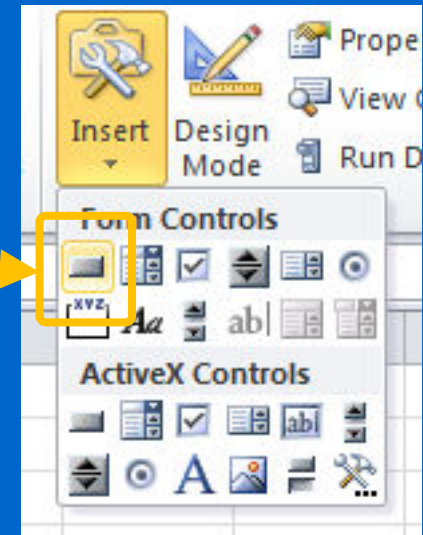
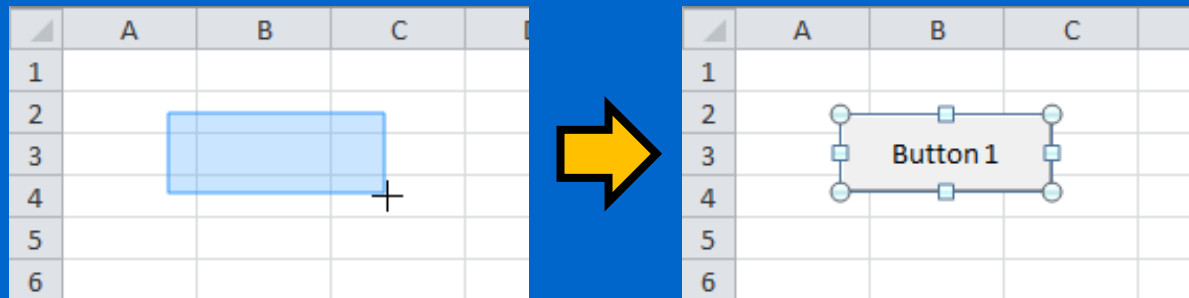
# Properties Window of ActiveX Controls

- In the previous example we saw the properties window of the label ActiveX control
- A properties window is used to show the settings of every ActiveX control, not just for a label control
- For example, the visual parameters can be changed here
- However, Form controls do not enjoy this kind of flexibility



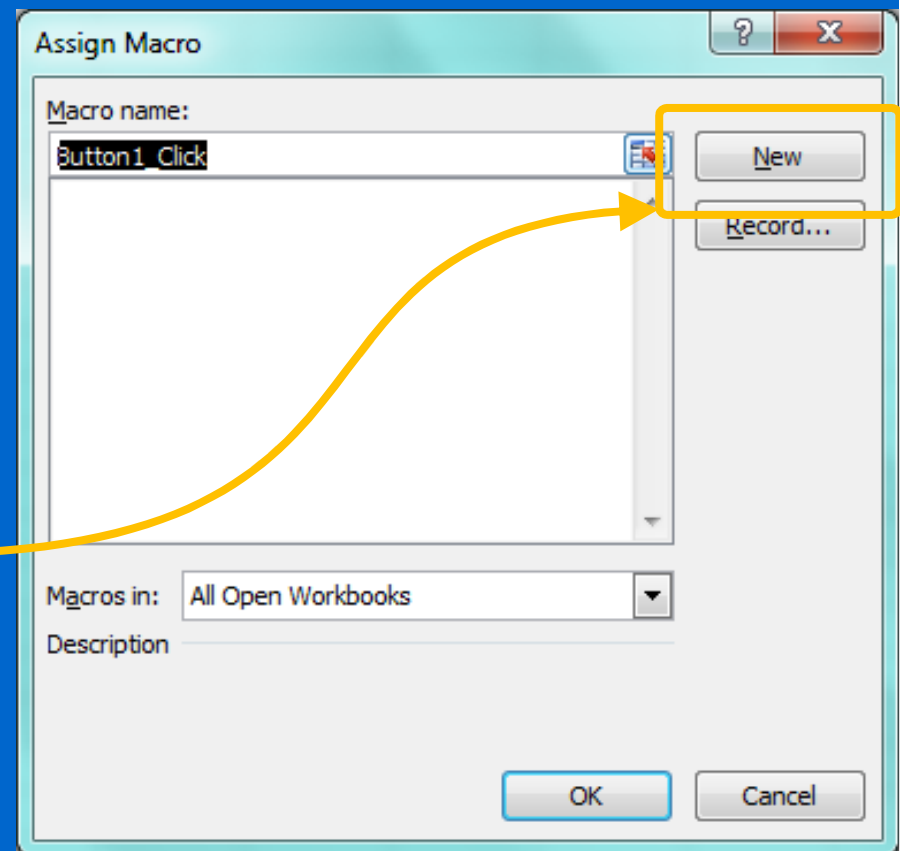
# Creating a Button Form Control 1/3

- To add a button Form control we select the button Form control icon
- Then we click and drag the button at the location we want to put it, like this:



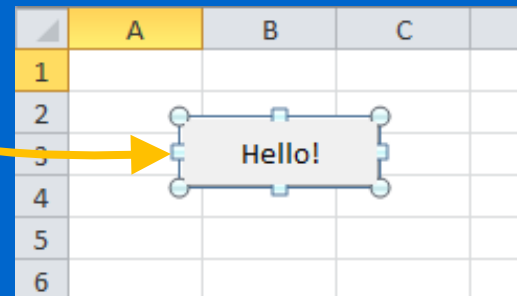
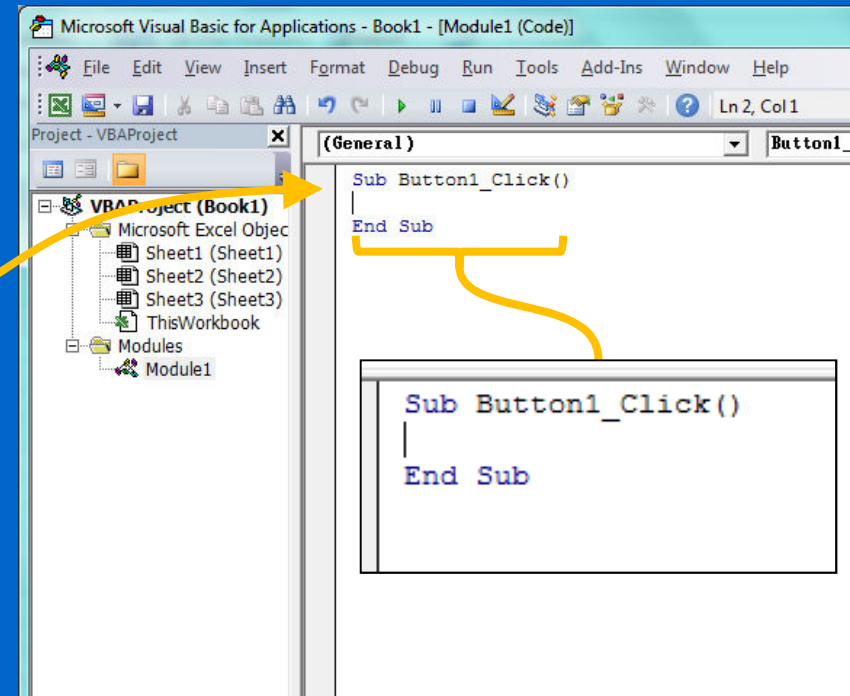
# Creating a Button Form Control 2/3

- Before the button is added to the worksheet an 'Assign Macro' window will pop up asking for a macro to be assigned to the button
- This macro will be the function executed by VBA when the button is clicked
- If the macro does not exist it will be useful to click the 'New' button to create it now



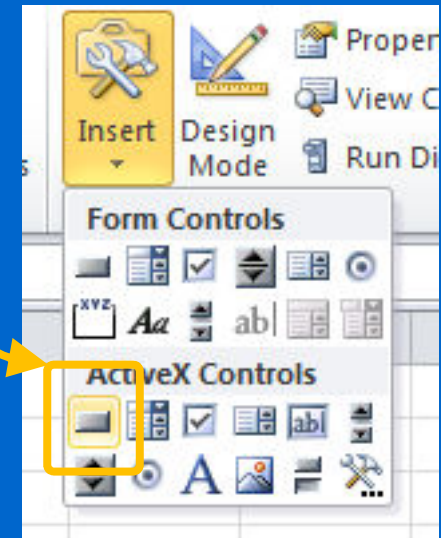
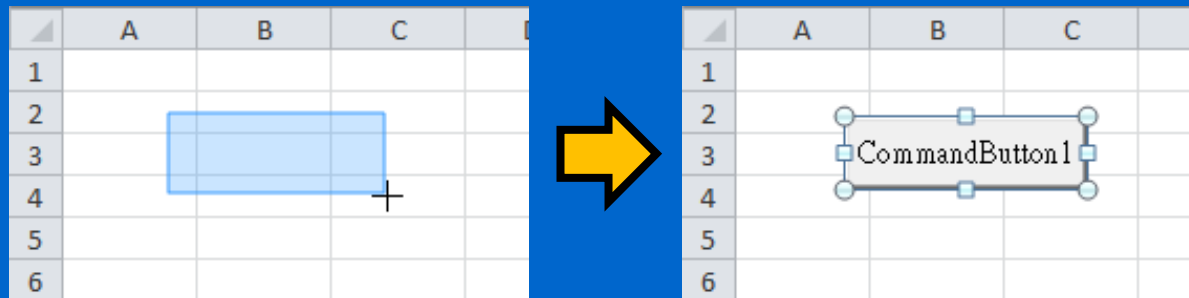
# Creating a Button Form Control 3/3

- After the macro shell has been added we can start to write the VBA code for the button there
- In addition, we can change the text of the button by right-clicking on the button and then change the text



# Creating a Button ActiveX Control 1/3

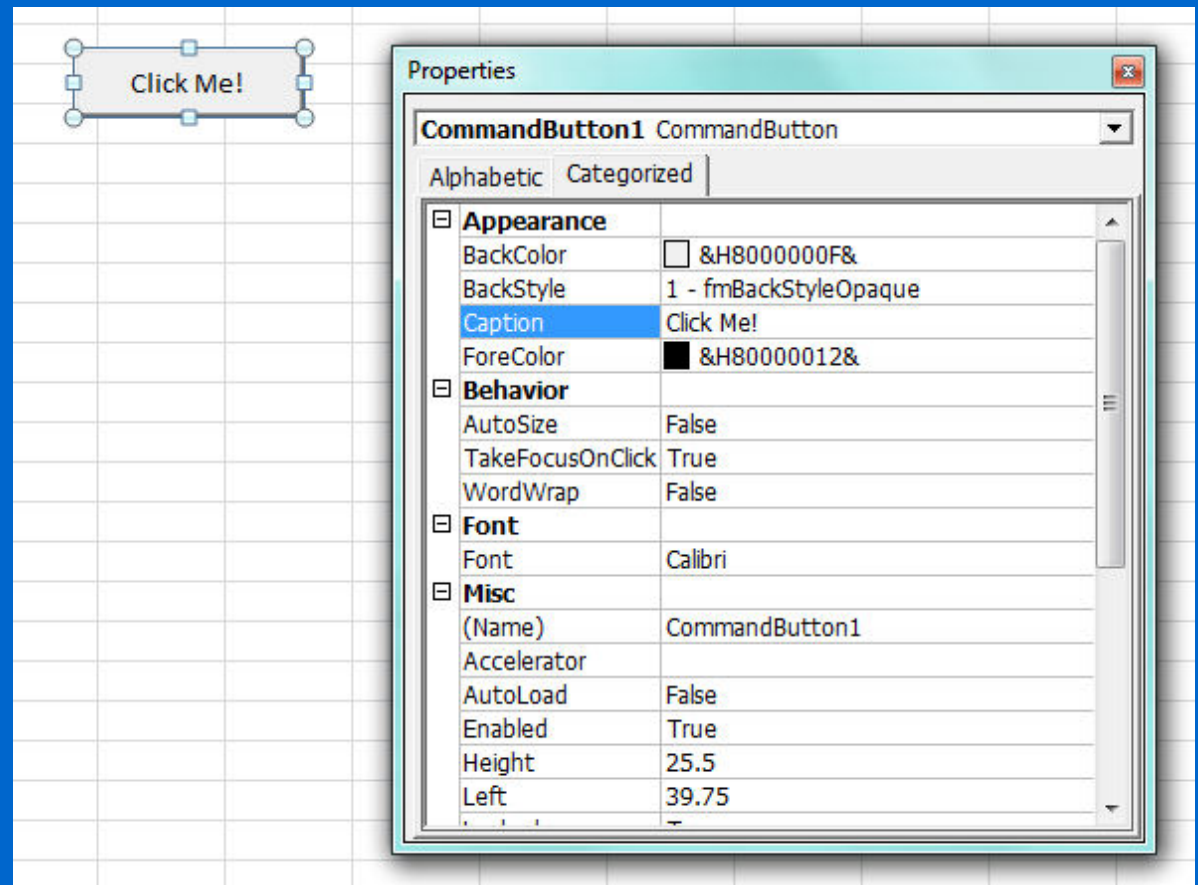
- To add a button ActiveX control we select the button ActiveX control icon
- Then we click and drag the button at the location we want to put it, like this:





# Creating a Button ActiveX Control 2/3

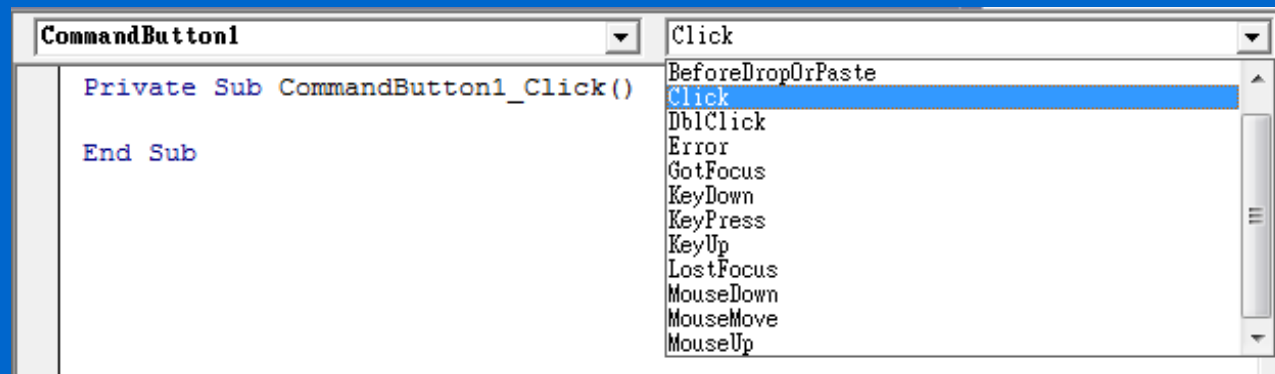
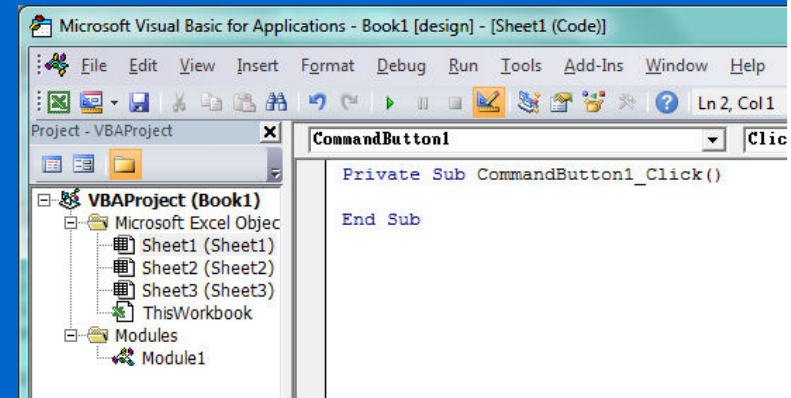
- We can bring up the properties window of the newly created button and give it some new text to display, like this:





# Creating a Button ActiveX Control 3/3

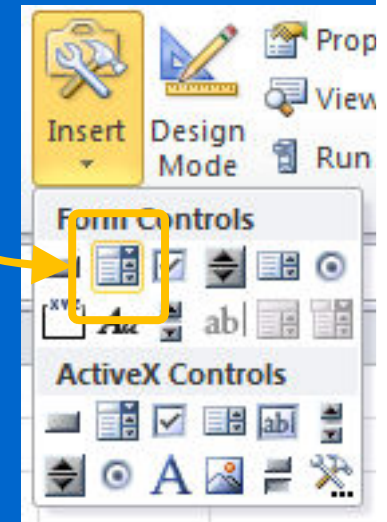
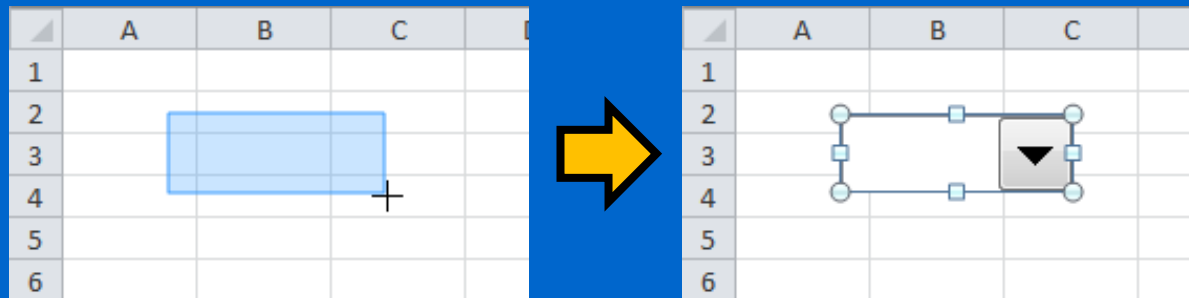
- To write VBA code in the event handler of the button we can double-click on the button to edit the default event handler, i.e. the 'Click' event handler
- If the default event is not suitable you can always select another event and write VBA code for them



Select another event from the combo box on the right of the editor

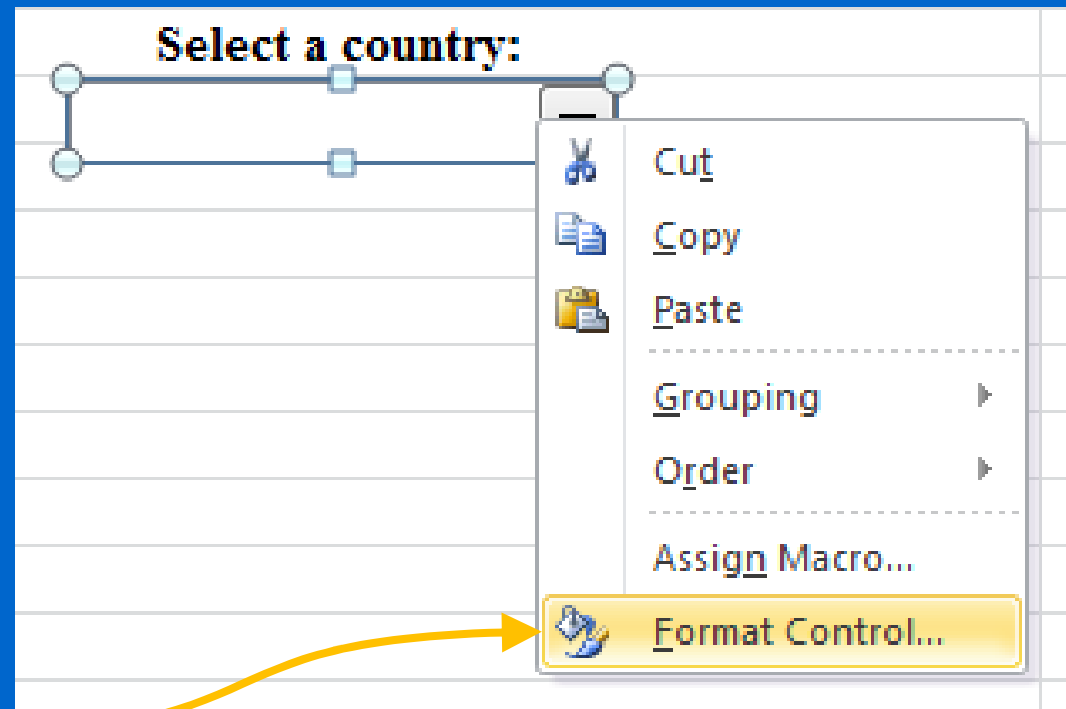
# Creating a Combo Box Form Control 1/5

- To add a combo box Form control we select the combo box Form control icon
- Then we click and drag the combo box at the location we want to put it, like this:



# Creating a Combo Box Form Control 2/5

- An item list has to be set up for the combo box
- The list has to come from a worksheet
- To do this we can right-click on the control and then select 'Format Control'



# Creating a Combo Box Form Control 3/5

- The input range of the combo box items can be specified in the 'Control' tab of the 'Format Control' window
- For example, the input range is set to the list of locations, i.e.  $\$D\$5:\$D\$8$ , in the same worksheet here:

The screenshot shows an Excel worksheet with a form control labeled "Select a country:" containing the text "Hong Kong". Below it, the "Format Control" window is open, with the "Control" tab selected. The "Input range" is set to  $\$D\$5:\$D\$8$ . A yellow arrow points from this range to a table in the worksheet. The table has two columns: "Key" and "Location". The "Location" column contains the values "Hong Kong", "Macau", "Taiwan", and "Mainland China", which are highlighted by a yellow box. Another yellow arrow points from the "Drop down lines" field (set to 8) in the "Format Control" window to the form control.

| Key | Location       |
|-----|----------------|
| 1   | Hong Kong      |
| 2   | Macau          |
| 3   | Taiwan         |
| 4   | Mainland China |

# Creating a Combo Box Form Control 4/5

- Apart from the input range the combo box can display the index (from 1 to the total number of items) of the selected item in a particular cell, like this:

| Key | Location       |
|-----|----------------|
| 1   | Hong Kong      |
| 2   | Macau          |
| 3   | Taiwan         |
| 4   | Mainland China |

The index of 'Taiwan' is 3 within the list

**Format Control**

Size | Protection | Properties | Alt Text | **Control**

Input range: \$D\$5:\$D\$8

Cell link: \$A\$9

Drop down lines: 8

☐ 3-D shading

# Creating a Combo Box Form Control 5/5

- How to display the selected item text in a cell?
- We can simply use a *VLOOKUP* to search for the item text using the item list in the worksheet

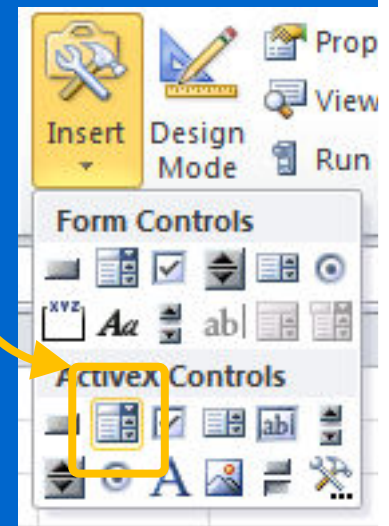
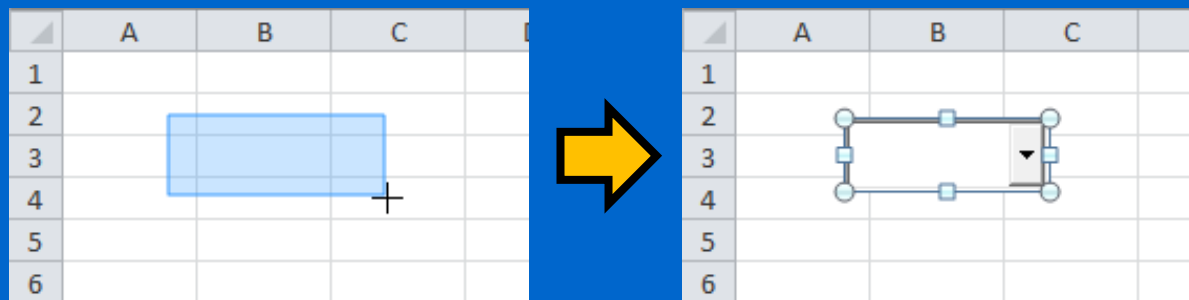
The diagram shows a worksheet with a form control and a data table. The form control is a dropdown menu labeled "Select a country:" with "Taiwan" selected. Below it, a text box displays "The result of your selection:" followed by the number "3". Another text box below that also displays "The result of your selection:" followed by "Taiwan". A data table to the right has two columns: "Key" and "Location". The table contains four rows: (1, Hong Kong), (2, Macau), (3, Taiwan), and (4, Mainland China). Yellow arrows indicate the flow of data: one arrow points from the "3" in the first result box to the "3" in the second result box, and another arrow points from the "3" in the second result box to the "3" in the VLOOKUP formula. A third arrow points from the "Taiwan" in the second result box to the "Taiwan" in the VLOOKUP formula. A fourth arrow points from the "Location" column header to the "Location" column of the data table. The VLOOKUP formula is: `=VLOOKUP(FormSelectedIndex, Selecting_a_country!C5:D8, 2, TRUE)`

| Key | Location       |
|-----|----------------|
| 1   | Hong Kong      |
| 2   | Macau          |
| 3   | Taiwan         |
| 4   | Mainland China |

`=VLOOKUP(FormSelectedIndex, Selecting_a_country!C5:D8, 2, TRUE)`

# Creating a Combo Box ActiveX Control 1/7

- To add a combo box ActiveX control we select the combo box ActiveX control icon
- Then we click and drag the combo box at the location we want to put it, like this:



# Creating a Combo Box

## ActiveX Control 2/7

- Similar to the combo box Form control an item list has to be set up first
- For combo box ActiveX control the list is specified in the properties window, like this:

The screenshot shows an Excel spreadsheet with a Combo Box ActiveX control. The control is labeled "Select a Country:" and currently displays "Macau". Below the control is the "Properties" window for "ComboBox1". The "ListFillRange" property is set to "\$D\$5:\$D\$8". A yellow arrow points from this property to a table in the spreadsheet.

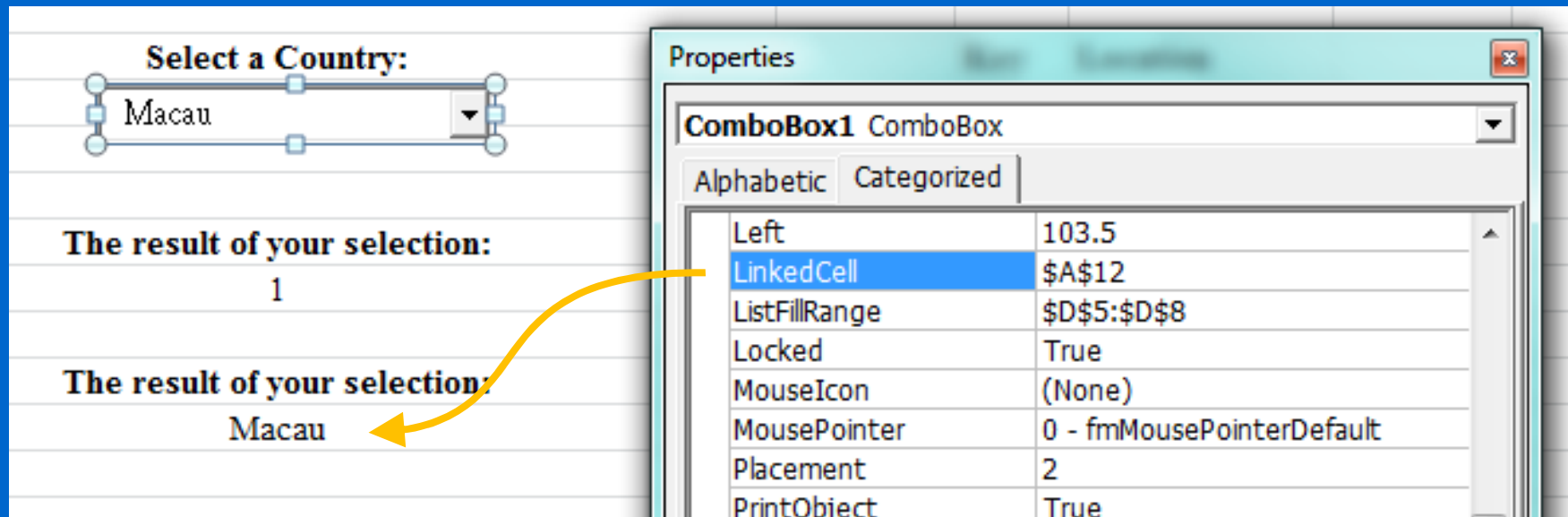
| Key | Location       |
|-----|----------------|
| 0   | Hong Kong      |
| 1   | Macau          |
| 2   | Taiwan         |
| 3   | Mainland China |



# Creating a Combo Box

## ActiveX Control 3/7

- Similar to the Form control, the combo box ActiveX control can be linked with the content of a cell
- However, as opposed to displaying the index of the selected item, the combo box ActiveX control shows the item text in the linked cell, like this:



# Creating a Combo Box

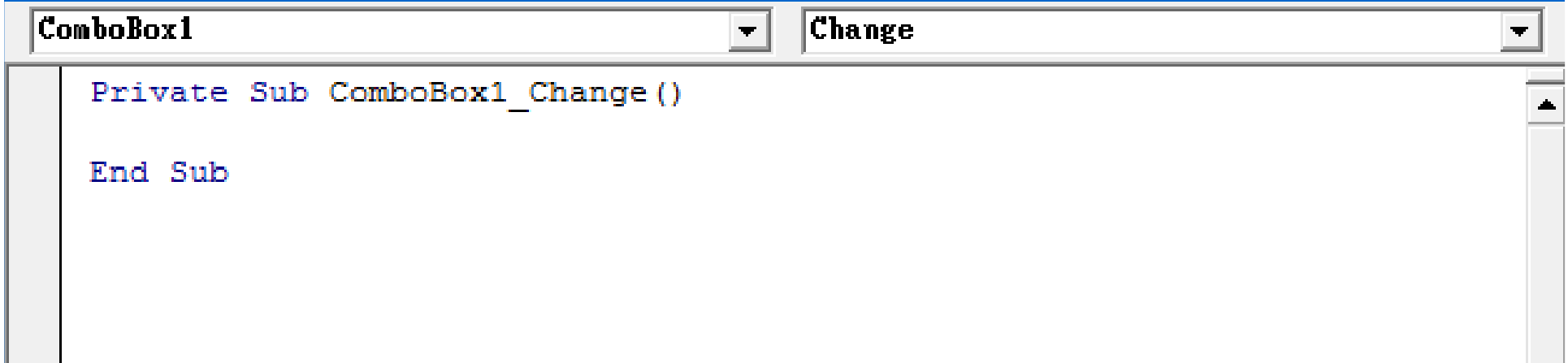
## ActiveX Control 4/7

- If you want to show the index of the item in the worksheet you need to do it by yourself
- Similar to the combo box Form control example, you can use a *VLOOKUP* to do that
- However, in this example we will use an event handler to show the index of the item
- The event handler we use is the 'Change' event of the combo box

# Creating a Combo Box

## ActiveX Control 5/7

- To create the event handler we double-click on the combo box ActiveX control
- The default event of the combo box is the 'Change' event as shown below:



# Creating a Combo Box

## ActiveX Control 6/7

- To display the index of the combo box the following code is used:

```
Private Sub ComboBox1_Change()  
    ActiveSheet.Range("A9") = _  
        ComboBox1.ListIndex  
End Sub
```

- The above code puts the *ListIndex* value of the combo box in cell A9 of the worksheet

# Creating a ComboBox

## ActiveX Control 7/7

- For example, the following picture shows the index of the selection when the selected text is Macau:

| Select a Country: |  | Key | Location       |
|-------------------|--|-----|----------------|
| <div>Macau</div>  |  | 0   | Hong Kong      |
|                   |  | 1   | Macau          |
|                   |  | 2   | Taiwan         |
|                   |  | 3   | Mainland China |

The result of your selection:

1

The result of your selection:

Macau

Note that the index for a combo box ActiveX control starts from 0 whereas the index for a Form control starts from 1