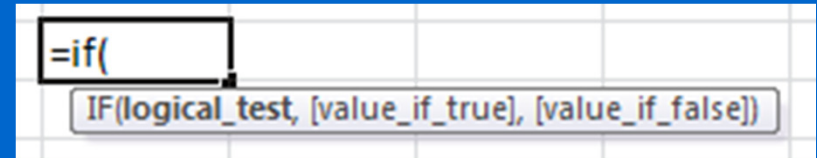COMP1022Q
Introduction to Computing with Excel VBA

Making Basic Decisions in VBA

David Rossiter, Eddie Chan and Oz Lam

Using `IF` in a Cell


```
=if(
    IF(logical_test, [value_if_true], [value_if_false])
```

- Let's review the cell formula `IF` function we saw before
- `IF(` *condition* `,` *some code or value...* `)`

  - *Excel will test this condition*

  - *Everything put here will be executed/returned if the result of the test is* `True`
  - `False` *will be returned if the result of the test is* `False`

- For example:
  `IF(` `B4 > 3` `,` `"Cell B4 is greater than 3!"` `)`

Using `If` in VBA

- Like the cell's `IF` function, the VBA `If` statement is also used to control the flow of the program based on a condition
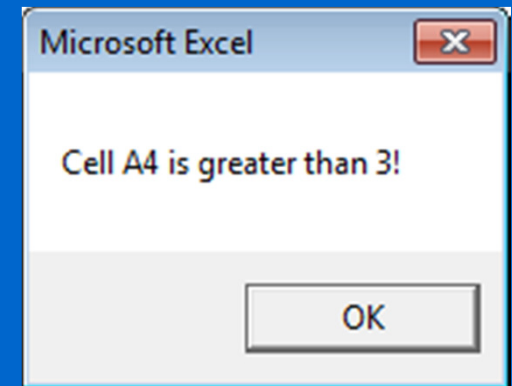- The VBA `If` statement looks like this:

```
If condition Then
    some code
End If
```

- • *Condition to be tested*

- • *Everything put here will be executed if the result of the test is* `True`, *otherwise it is ignored*

```
Microsoft Excel

Cell A4 is greater than 3!

OK
```

- For example:

```
If Range("A4").Value > 3 Then
    MsgBox "Cell A4 is greater than 3!"
End If
```

Using VBA to Put Something in a Cell

- In another presentation, we describe how you can store something in a VBA variable

- Let's look at how you can put something into a cell using VBA, like this:
  ```
  Range("D4").Value = something
  ```
  The destination cell

- For example, we can change the example in the previous slide to show the message in cell D4:
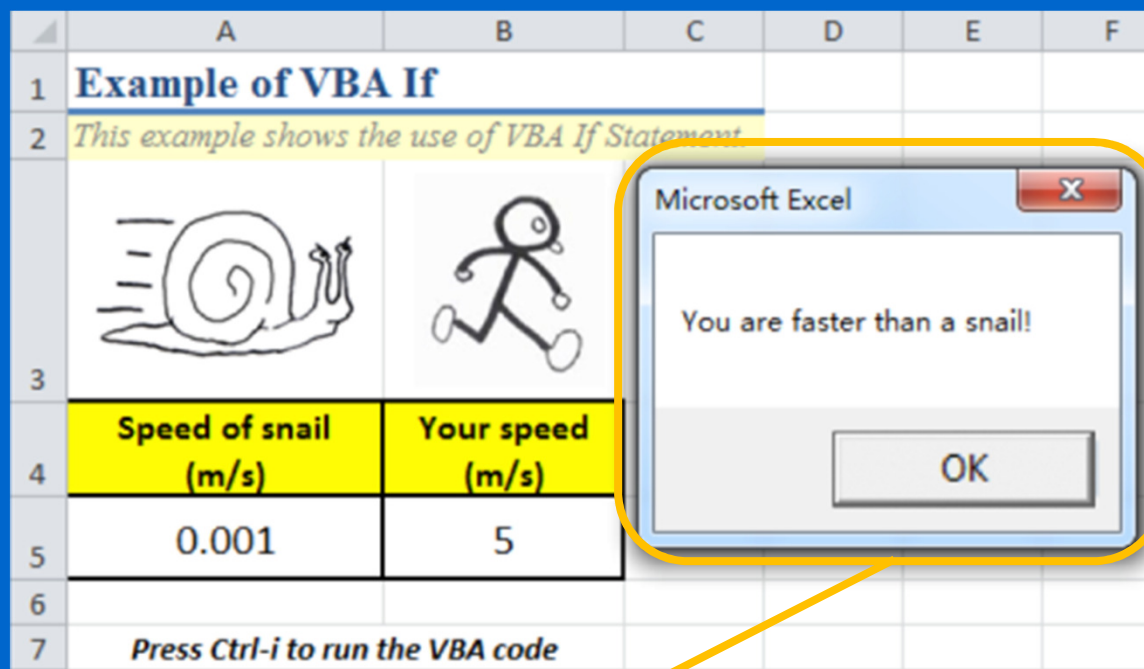 ```
  If Range("A4").Value > 3 Then
      Range("D4").Value = "Cell A4 is greater than 3!"
  End If
  ```

# An Example of VBA `If` 1/2

- If your speed is faster than that of a snail, this example will pop up a message showing "You are faster than a snail!"



```
If Range("B5").Value > Range("A5").Value Then ✔
    MsgBox "You are faster than a snail!"
End If
```
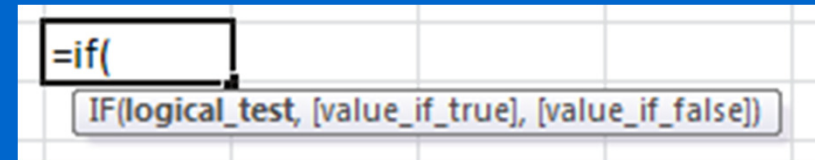
# An Example of VBA If 2/2

- If your speed is slower than or equal to that of the snail, it will do nothing



```
If Range("B5").Value > Range("A5").Value Then  ✗
    MsgBox "You are faster than a snail!"
End If
```

The Extended `If` in Cell Formulas

=if(

IF(logical_test, [value_if_true], [value_if_false])

- Here is a reminder of the extended `IF` we discussed previously:

  IF(*condition* , *code1 or value1…* , *code2 or value2…*)

  - *Excel will test this condition*

  - *Everything put here will be executed/returned if the result of the test is* `True`

  - *Everything put here will be executed/returned if the result of the test is* `False`

- For example:

  ```
  IF( B4 > 3 ,
      "Cell B4 is greater than 3!" ,
      "Cell B4 is smaller than or equal to 3!" )
  ```

The VBA `If...Else...` Statement

- The equivalent VBA structure looks more friendly:

```
If condition Then
    code1
Else
    code2
End If
```

- *Condition will be tested*
- *Everything put here will be executed if the result of the test is `True`*
- *Everything put here will be executed if the result of the test is `False`*

- For example:

```
IF Range("B4") > 3 Then
    MsgBox "Cell B4 is greater than 3"
Else
    MsgBox "Cell B4 is smaller than or equal to 3!"
End If
```

An Example of VBA `If...Else...` 1/2

- If the money in your pocket is more than or equal to the cost of the chocolate, this example will pop up a message showing "I have enough money to buy chocolate! Yea!!" - else *see next slide*


```
If Range("A5") >= Range("B5") Then ✔
   ➡MsgBox "I have enough money to buy chocolate! Yea!!"
Else
   MsgBox "No chocolate for me today :("
End If
```

An Example of VBA `If…Else…` 2/2

- If the money in your pocket is less than the cost of the chocolate, it will pop up a message showing "No chocolate for me today :("


```
If Range("A5") >= Range("B5") Then  ✗
    MsgBox "I have enough money to buy chocolate! Yea!!"
Else
 ➡  MsgBox "No chocolate for me today :("
End If
```

Nested IF in Cell Formulas

- Here is a reminder of the nested IF we discussed previously:

- IF(*condition1* , *code1 or value1…,*
  IF(*condition2* , *code2 or value2…,* *code3 or value3…*))

- *Excel will test this condition first*

- *Everything put here will be considered if the result of the first test is* False

- *Excel will test this condition if the result of the first test is* False

- *Everything put here will be executed/returned if the results of both of the tests are* False

- For example:
  ```
  IF( B4 > 3 ,  "Cell B4 is greater than 3!",
    IF( B4 < 3 ,  "Cell B4 is smaller than 3!",
        "Cell B4 is equal to 3!" )    )
  ```

The VBA `If…ElseIf…Else…` Statement

- In VBA, we can do the same thing like this:
- IF *condition1* Then

        code1

  ElseIf *condition2* Then
        code2

  Else
        code3

  EndIf

- **condition1** will be tested first
- *Everything put here will be considered if* **condition1** *test result is* `False`
- **condition2** *will be tested if* **condition1** *test result is* `False`
- *Everything put here will be executed if the results of both tests are* `False`

- IF Range("B4").Value > 3 Then
        MsgBox "Cell B4 is greater than 3!"
  ElseIf Range("B4").Value < 3 Then
        MsgBox "Cell B4 is smaller than 3!"
  Else
        MsgBox "Cell B4 is equal to 3!"
  EndIf

VBA `If…ElseIf…Else…` Example 1/3

- If the money in your pocket is more than or equal to the cost of the big bar of chocolate, this example will pop up a message showing "I have enough money to buy a big bar of chocolate! Yea!!" - else *see next slide*


```
If Range("A5").Value >= Range("B5").Value Then ✔
    MsgBox "I have enough money to buy a big bar of chocolate! Yea!!"
ElseIf Range("A5").Value >= Range("C5").Value Then
    MsgBox "I have enough money to buy a small bar of chocolate!"
Else
    MsgBox "No chocolate for me today :("
End If
```

VBA `If…ElseIf…Else…` Example 2/3

- If the money in your pocket is less than the cost of the big bar of chocolate but is more than or equal to the cost of the small bar of chocolate, it will pop up a message showing "I have enough money to buy a small bar of chocolate!" - else *see next slide*


```
If Range("A5").Value >= Range("B5").Value Then    ✗
    MsgBox "I have enough money to buy a big bar of chocolate! Yea!!"
ElseIf Range("A5").Value >= Range("C5").Value Then    ✔
    MsgBox "I have enough money to buy a small bar of chocolate!"
Else
    MsgBox "No chocolate for me today :("
End If
```

VBA `If…ElseIf…Else…` Example 3/3

- If the money in your pocket is less than the cost of both the big and small bar of chocolate, it will pop up a message showing "No chocolate for me today :("


```
If Range("A5").Value >= Range("B5").Value Then  ✗
    MsgBox "I have enough money to buy a big bar of chocolate! Yea!!"
ElseIf Range("A5").Value >= Range("C5").Value Then  ✗
    MsgBox "I have enough money to buy a small bar of chocolate!"
Else
    MsgBox "No chocolate for me today :(" )
End If
```

Making the Chinese Discount Example Using VBA

- In this example, we will use VBA instead of cell functions to update the result cell

- To run the VBA, we will use a keyboard shortcut

The VBA Code

- ## Here is the VBA code:

```
Sub update_chinese_discount_number()

    Dim ArabicDiscount As Integer
    Dim ChineseDiscount As String

    ArabicDiscount = Range("B5").Value

    ChineseDiscount = ""
```

Create two variables

Initialize this variable with the English discount value held in cell B5

Initialize this variable with an empty string

Continued on the next slide

```vba
If ArabicDiscount = 10 Then
    ChineseDiscount = "九"
ElseIf ArabicDiscount = 20 Then
    ChineseDiscount = "八"
ElseIf ArabicDiscount = 30 Then
    ChineseDiscount = "七"
ElseIf ArabicDiscount = 40 Then
    ChineseDiscount = "六"
ElseIf ArabicDiscount = 50 Then
    ChineseDiscount = "五"
ElseIf ArabicDiscount = 60 Then
    ChineseDiscount = "四"
ElseIf ArabicDiscount = 70 Then
    ChineseDiscount = "三"
ElseIf ArabicDiscount = 80 Then
    ChineseDiscount = "二"
ElseIf ArabicDiscount = 90 Then
    ChineseDiscount = "一"
Else
    MsgBox "Invalid discount percentage"
End If
```

Go through all the possibilities

- You can see the code shown on the left uses Chinese characters
- However, in the actual code the Chinese characters have to be entered using the `ChrW()` function, e.g. you have to use `ChrW(19968)` to represent '一' in the code
- This is because the VBA editor does not support Chinese

```vba
' Update cell D8
' with the output
Range("D8").Value = _
    ChineseDiscount
End Sub
```

If all the previous tests fail, this code will be executed

Example Results

- Here are three example results:

This is 2 in Chinese

This is 4 in Chinese