

### Conditional Logic

#### If... Then

In logic, a conditional is a statement formed by combining two sentences (or facts) using the words "if ... then." It is about saying what has to happen IF a certain condition is met, or what has to happen if it is not met. Whether the block is executed is determined by the specified condition, a boolean expression which returns either True or False. Essentially, it looks like:

```
If Condition Then
```

```
    DoSomething1
```

```
    DoSomething2
```

```
End If
```

For example:

```
If ExamScore > 6 Then
```

```
    MsgBox "Passed!"
```

```
End If
```

## Else

Between If and End If you can add an Else part. The structure of an If ... Else Statement looks like this:

For example:

```
If temperatures < -20 Then
```

```
    Stay inside at the stove
```

```
Else
```

```
    go for a walk
```

```
End If
```

## ElseIf

Not every condition can be reduced to a simple either/or. Quite often, there are more than two options you want to check for. If the first condition is False, you try to match a following condition with ElseIf. Here's the structure of an ElseIf Statement:

```
If Condition Then
```

```
    DoSomething1
```

```
ElseIf Condition2 Then
```

```
    DoSomethingDifferent2
```

```
ElseIf Condition3 Then
```

```
    DoSomethingDifferent3
```

You can also add an Else part at the end, to catch all other cases:

```
If Condition Then
```

```
    DoSomething1
```

```
ElseIf Condition2 Then
```

```
    DoSomethingDifferent
```

```
Else
```

```
    .....
```

```
End If
```

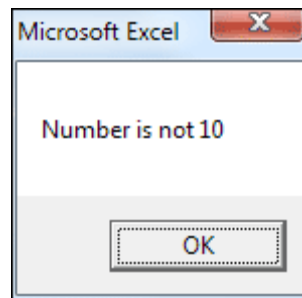
```
End If
```

Example:

What we're saying is, "If MyNumber has a value of 10 Then display one message box (Number = 10) , Else display another message box (Number is not 10)".

```
Sub if_condition()  
  
Dim MyNumber As Integer  
  
MyNumber = 11  
  
If MyNumber = 10 Then  
    MsgBox "Number = 10"  
  
Else  
    MsgBox "Number is not 10"  
  
End If  
End Sub
```

Run your code. You should see the message from the Else part appear:

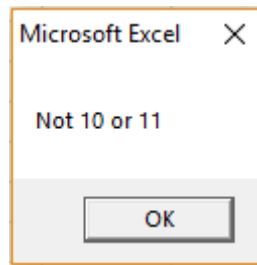


Return to your coding window again and change MyNumber to 12. If you try to run your code now, nothing will happen. Nothing happens because both the IF and the ElseIf line evaluate to FALSE.

Now try to change your code by adding Else with message box.

```
Sub if_condition()  
If MyNumber = 10 Then  
MsgBox "Number = 10"  
ElseIf MyNumber = 11 Then  
MsgBox "Number = 11"  
Else  
MsgBox "Not 10 or 11"  
End If  
End Sub
```

Run your code again and you'll find that the third message box display. By adding Else you've guaranteed that at least one part of your If statement will be TRUE.



### **Conditional Operator**

In the previous example on If Statements, we've already used one conditional operator - the equal sign. But there are others. Here's a table of them:

<b>Operator</b>	<b>Meaning</b>
=	Has a value of
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
<>	Not equal to

By using the various Operators, you can set up more sophisticated conditions for your If Statements.

You can have more than one condition on the same line of your If and Elseif Statements. To test for more than one condition, you need the Logic Operators. Here's a table of them:

<b>Operator</b>	<b>Meaning</b>
Not	Test if the value is NOT something
AND	Test for more than one condition
OR	Test if the value is either OR something
XOR	Test if one and only one value is true

**Example:**

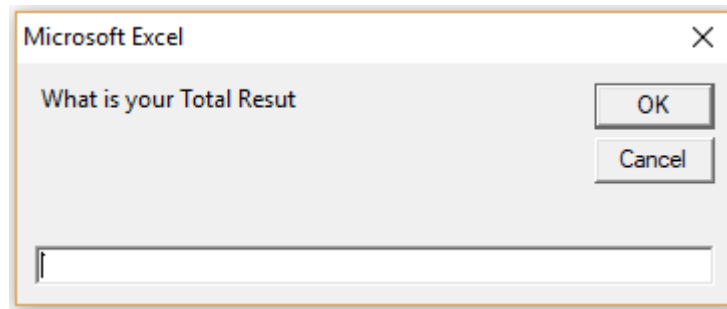
The following table shows the result range and Letter Grade. Write a code that require the result from the user and show your Letter Grade on the message box.

<b>Result (out of 100)</b>	<b>Letter Grade</b>
85-100	A
75-84	B
65-74	C
50-64	D
35-49	D-
0-34	F

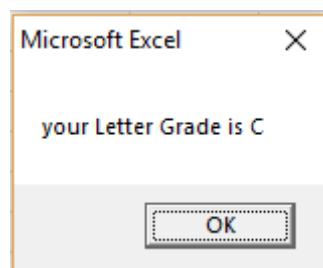
The code will be the following:

```
Sub if_condition()  
    Dim result As Integer  
    Dim Lettergrade As String  
  
    result = InputBox(" What is your Total Resut")  
  
    If result >= 85 And result <= 100 Then  
        Lettergrade = "A"  
    ElseIf result >= 75 And result < 85 Then  
        Lettergrade = "B"  
    ElseIf result >= 65 And result < 75 Then  
        Lettergrade = "C"  
    ElseIf result >= 50 And result < 65 Then  
        Lettergrade = "D"  
    ElseIf result >= 35 And result < 50 Then  
        Lettergrade = "D-"  
    ElseIf result < 35 Then  
        Lettergrade = "F"  
    End If  
  
    MsgBox (" your Letter Grade is " & Lettergrade)  
  
End Sub
```

If you run the code the Input box window will appear and you can put the result out of 100.



Assume you wrote 68 and click OK, then messagebox window will appear and shows C as your Letter grade. (You can try it again with different result)



### **Nested If**

An If or ElseIf statement inside another If or ElseIf statement(s). The inner If statements are executed based on the outermost If statements.

Following is the structure of an Nested If statement in VBA

```
If Condition A Then
```

```
    DoSomething A
```

```
If Condition1 Then
```

```
    DoSomethingDifferent1
```

```
ElseIf Condition2 Then
```

```
    DoSomethingDifferent2
```

```
Else
```

```
    DoSomethingDifferent3
```

```
End If
```

```
ElseIf Condition B Then
```

```
    DoSomething B
```

```
Else
```

```
    DoSomethingDifferent
```

```
End If
```



**Example:**

For previous example, write a code shows if you passed or failed in message box, then if you pass what is his Letter Grade? However, if you failed just show in the message box that you failed. (Passing result is 50 and more)

```
Sub if_condition()  
    Dim result As Integer  
    Dim Lettergrade As String  
  
    result = InputBox(" What is your Total Resut")  
    If result >= 50 Then  
        MsgBox " You passed "  
        If result >= 85 And result <= 100 Then  
            Lettergrade = "A"  
        ElseIf result >= 75 And result < 85 Then  
            Lettergrade = "B"  
        ElseIf result >= 65 And result < 75 Then  
            Lettergrade = "C"  
        ElseIf result >= 50 And result < 65 Then  
            Lettergrade = "D"  
        End If  
        MsgBox (" your Letter Grade is " & Lettergrade)  
  
    Else  
        MsgBox " You Failed "  
    End If  
  
End Sub
```