Conditional Statements

If these were easy then everyone would them!
Wanna Buy This Veg-O-Matic Chopper?

- Your typical reaction might be: “I don’t know. How much does it cost?”
- We usually make those decisions on the basis of some criteria: cost, benefit, amount, need, or some other factor.
Definition of Conditional Statements

- Conditional Statements allow us to execute code selectively.
  - So during a specific situation we can choose to execute some code and not others.
- The situation is identified by a comparison expression
How it Works

- When the comparison returns a true, a selected portion of code is executed.
- There are also versions that allow us to execute some code if the comparison is true, and other code if the comparison is false.
Execution Based on Condition

- Statement Conditional
  - If Condition is TRUE
    - Statement
    - Statement
    - Statement
    - IF Statement
- Statement Conditional
  - If Condition is TRUE
  - If Condition is FALSE
  - Statement
  - IF then ELSE Statement
Syntax -
A Definition

- Not a tax on things that are bad for you!
- Syntax is the specification of a computer code. Such as:
  - Where operators go
  - When, and if, you need a comma
The If statement in Visual Basic has a specific form:

**If (condition) Then**

*Statements to Execute if condition is true.*

**End If**
Examples of the IF Statement

If (grade >= 90) Then
  ' if the grade is greater than or equal to 90 then

  letter_grade = “A”
  ' the letter grade is an “A”

End If
Examples of the IF Statement

If (hours = 24) Then
   ' if the hours are 24 then
   days = days + 1
      ' increase the number of days by one
   hours = 1
      ' set the hours back to 1
End If
Question:

Given the following program, what is the output?

```vbnet
Dim A as Single
A = 5
If (A > 5) Then
    MsgBox(A)
End If
```

A. A message box displaying the number 5
B. There is no output.
IF then ELSE-
The Syntax

The If then Else statement:

If (condition) Then
    Statements if condition is true.
Else
    Statements if condition is false.
End If
Examples of the IF then Else Statement

If ((b^2-4*a*c) < 0 Then
   MessageBox(“Roots are imaginary.”)"
Else
   r1 = (-b+sqrt(b^2-4*a*c)) / (2 * a)
   MessageBox(“Root” & r1)
End If
Another Example

Dim user_pi as Single
user_pi = InputBox("Pi?")
If (user_pi < 3.1416 And user_pi > 3.1414) Then
  MsgBox ("Very good!")
Else
  MsgBox ("Sorry, the answer is 3.1415")
End If
What is wrong with this statement?

```
Dim A as Single
A = val(text1.text)
If (A <= 5)
    MsgBox("Greater than 5")
Else
    MsgBox(Cstr(A))
End If
```

A: There is a syntax error
B: The wrong message is printed
C: The variable A is the wrong type.
D: A and B
E: None of the above.
Nesting If Statements

- If statements can be placed inside one another.
- Getting to the innermost code means all conditions are true
  - Which is precisely the same as And’ing them all together!
Example of Nesting

If (X < Y) Then
  If (X < Z) Then
    If (X < A) Then
      X = 0
    Else
      X = 1
    End If
  End If
End If
Question:

When will X be set to 1?

A: When A, B, and C are true
B: When A and C are true and B is false
C: When A and B are true and C is false
D: B and C
E: None of the above
The Select Case Statement is used instead of the If Statement when the decision is between many alternatives instead of two.
Selecting a Case

- The Select Case decides which block of code to execute based on an expression.
- Each case is a potential value for a variable. When the number of the expression matches the case, that case is selected.
- Sometimes its difficult to know all the cases that can come up so the Select Case gives us the Case Else. This essentially says, “Hey, if nothing else matches, do this!”
Select Case Statement -
The Syntax

Select Case Test Expression
Case Expression List 1
  First Statement Block
Case Expression List 2
  Second Statement Block
Case Else
  Default Statement Block
End Select

The Test Expression can be any numeric or string expression
The expression List comes in one of three forms:

- A number that must be matched exactly.
- Two numbers separated with the word ‘To’, which is a range the number must be in.
- A comparison operator and a value. The number must be in the comparison operators relationship to the value.
Examples of the Select Case Statement

Select Case temp
  Case 0
    MsgBox "You're frozen!"
  Case 1 To 90
    MsgBox "Are you dead?"
  Case 98.6
    MsgBox "You're fine"
  Case Is > 98.6
    MsgBox "You have a fever!"
End Select
Another Example

Select Case Temp
   Case < 98.6
      MsgBox "You’re Cold"
   Case > 98.6
      MsgBox "You’ve a Fever"
   Case Else
      MsgBox "You should never see this."
End Select
Question:

Select Case score
  Case < 60
    MsgBox “Didn’t Study”
  Case < 70
    MsgBox “Not Enough”
  Case < 80
    MsgBox “More”
  Case > 80
    MsgBox “Nice Job!”
End Case

Which case is missing?

A: When the student studied too much.
B: When the student got an 80
C: When the student got a 100
D: B and C
E: None of the above
Example Programs

- Validating The Password
- Checking the Quadratic Formula