

Conditional structures

Fundamentals of Computer Science

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Conditional structures

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Conditionals | Ex07: Simple cond.

1. Example 07

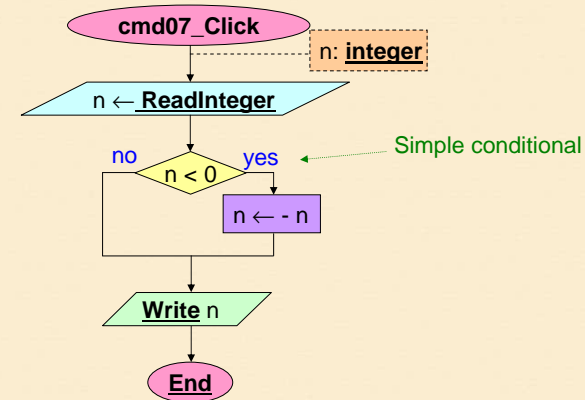
- **Title**
 - Simple conditional
- **Name**
 - cmd07_Click
- **Description**
 - Read an integer variable, calculate its **absolute value** (on the same variable) and show the result
- **Observation**
 - Simple conditional



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Conditionals | Ex07: Simple cond.

Ex07: Flowchart



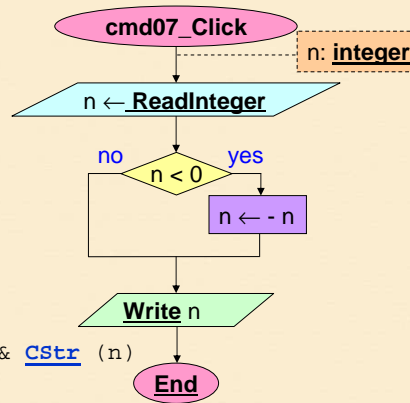
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Ex07: VB implementation

```

Sub cmd07_Click ()
  Dim s As String
  Dim n As Integer

  s = InputBox ("Number: ")
  n = CInt (s)
  If n < 0 Then
    n = -n
  End If
  MsgBox "Absolute value: " & CStr (n)
End Sub
    
```

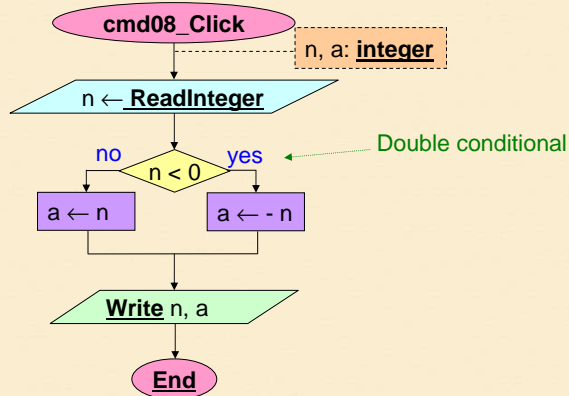


2. Example 08

- **Title**
 - Double conditional
- **Name**
 - cmd08_Click
- **Description**
 - Read an integer variable, calculate its absolute value (on a different variable) and show the result.
- **Observation**
 - Double conditional



Ex08: Flowchart

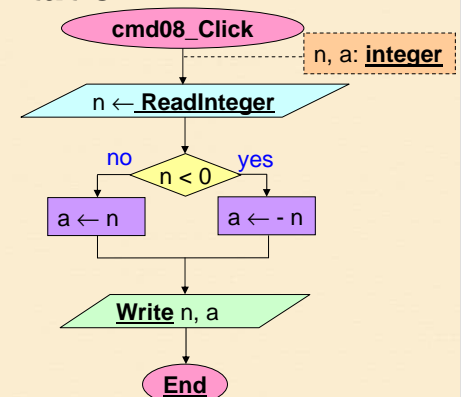


Ex08: VB implementation

```

Sub cmd08_Click()
  Dim s As String
  Dim n As Integer
  Dim a As Integer

  s = InputBox ("Number: ")
  n = CInt (s)
  If n < 0 Then
    a = -n
  Else
    a = n
  End If
  MsgBox "The absolute value of " & CStr (n) & _
    " is " & CStr (a)
End Sub
    
```

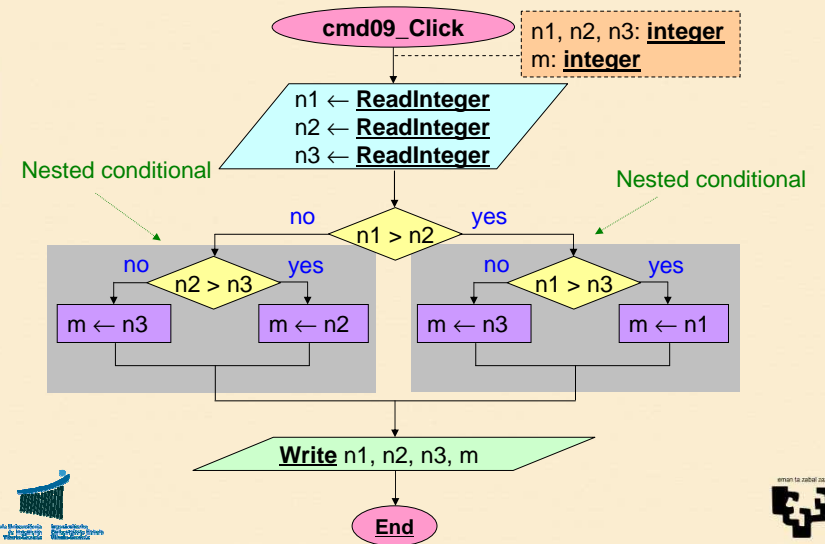


3. Example 09

- **Title**
 - Nested conditionals
- **Name**
 - cmd09_Click
- **Description**
 - Read three integer variables, calculate which is the greatest and show the result
- **Observation**
 - Nested conditional (conditional within another conditional)



Ex09: Flowchart



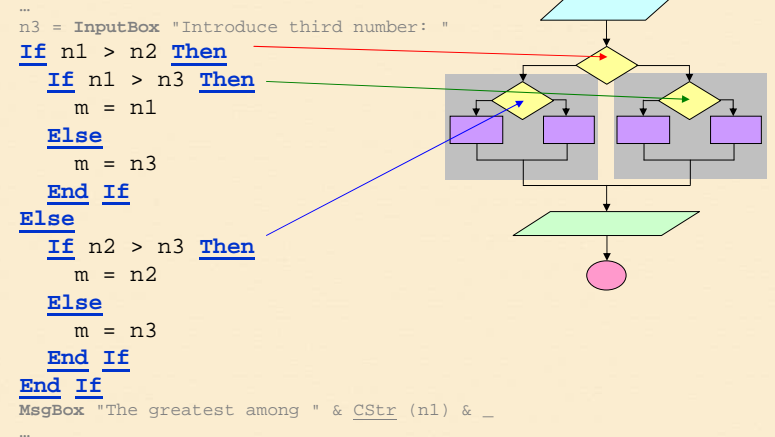
Ex09: VB implementation

```

Sub cmd09_Click()
    Dim s As String
    Dim n1 As Integer, n2 As Integer, n3 As Integer
    Dim m As Integer
    s = InputBox "Introduce first number: "
    n1 = CInt (s)
    s = InputBox "Introduce second number: "
    n2 = CInt (s)
    s = InputBox "Introduce third number: "
    n3 = CInt (s)
    ...
    MsgBox "The greatest among " & CStr (n1) & _
        ", " & CStr (n2) & _
        " and " & CStr (n3) & " is: " & m
End Sub
    
```



Ex09: VB implementation

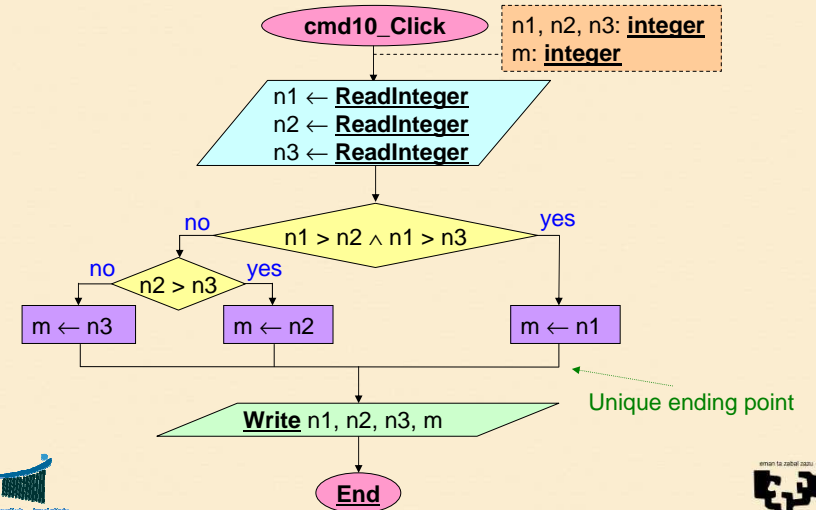


4. Example 10

- **Title**
 - Waterfall conditionals
- **Name**
 - cmd10_Click
- **Description** (same problem as in previous example)
 - Read three integer variables, calculate which is the greatest and show the result
 - Different solution variant
- **Observations**
 - Waterfall conditional
 - Immediately after the Else alternative there is a new condition, becoming ElseIf



Ex10: Flowchart



Ej10: VB implementation (I)

```

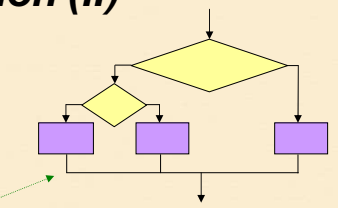
Sub cmd10_Click()
    Dim s As String
    Dim n1 As Integer, n2 As Integer, n3 As Integer
    Dim m As Integer
    s = InputBox "Introduce first number: "
    n1 = CInt(s)
    s = InputBox "Introduce second number: "
    n2 = CInt(s)
    s = InputBox "Introduce third number: "
    n3 = CInt(s)
    . . .
    MsgBox "The greatest among " & CStr(n1) & ", " & _
           CStr(n2) & " and " & CStr(n3) & _
           " is: " & CStr(m)
End Sub
    
```



Ej10: VB implementation (II)

```

...
n3 = CInt(s)
If n1 > n2 And n1 > n3 Then
    m = n1
ElseIf n2 > n3 Then
    m = n2
Else
    m = n3
End If
MsgBox "The greatest among " & CStr(n1) & ", " & _
...
    
```

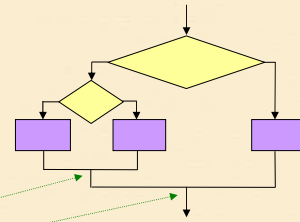


Ex10: Nested version (III)

```

...
n3 = CInt (s)
If n1 > n2 And n1 > n3 Then
    m = n1
Else
    If n2 > n3 Then
        m = n2
    Else
        m = n3
    End If
End If
MsgBox "The greatest among " & CStr (n1) & ", " & _
...

```



Two ending points



5. Recommendations (I)

- The body of conditional instructions will normally be indented two spaces for each nesting level. This indentation is added to the body of the subprogram.
- This is for the sake of legibility as Visual Basic will understand equally both ways

• **Example:**

```

Sub example ()
    . . .
    If a > b Then
        t = a
        a = b
        b = t
    End If
End Sub

```



5. Recommendations (II)

- To easy programming it is important to identify disjoint sets and the condition to distinguish them.
- It is better not to test again conditions that have already been excluded.
- **Example:**

```

If grade < 5 Then
    qual = "D"
ElseIf grade < 7 Then
    qual = "C"
ElseIf grade < 9 Then
    qual = "B"
Else
    qual = "A"
End If

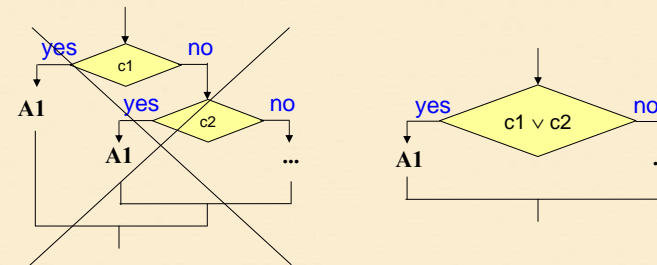
```

We do not re-test if it is greater than or equal to 5



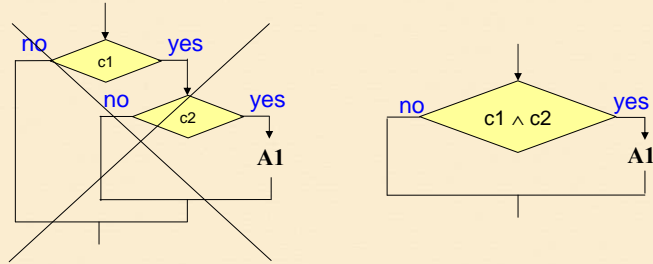
5. Recommendations (III)

- When we want to associate the same action with two conditions we must group both conditions in one



5. Recommendations (IV)

- When two conditions must be fulfilled simultaneously we shall not use two conditional instructions but only one with the conjunction of both conditions



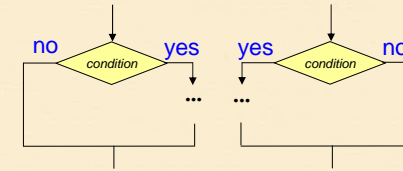
6. Summary (I)

- Simple conditional

If condition Then

...

End If



- Double conditional

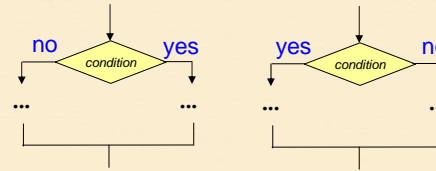
If condition Then

...

Else

...

End If



6. Summary (II)

- Nested conditional

If condition Then

...

Else

...

If condition Then

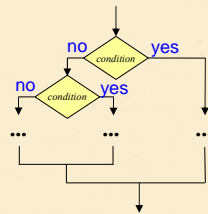
...

Else

...

End If

End If



- Waterfall conditional

If condition Then

...

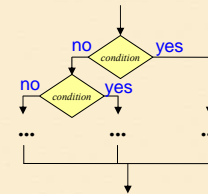
ElseIf condition Then

...

Else

...

End If



6. Summary (III)

- Incorrect simple conditional

If condition Then

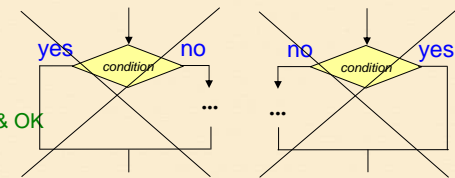
...

Else

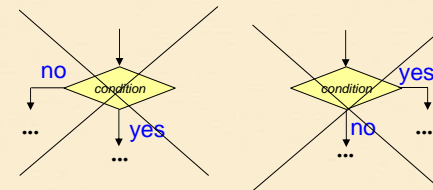
...

End If

- Negate the condition & OK



- Two incorrect representations (confusion with loops)





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