



SWE 1301: Introduction to Problem Solving and Software Development

Lecture 10: Nested-If-Then Decision Structure  
At: CIT Theatre  
1-2pm  
By: M .I. Mukhtar



## Lecture Outline

- ▶ **Decision Logic Structure**

- Recap on Nested-IF-Then
- More Examples on Nested-IF-Then.

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## Nested If--Else

- › **Nesting** allows multiple choices and instructions within **if** and **if...else** statements.
  - in particular they could contain other **if** or **if...else** statements;

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### Nested If Decision Logic Structure Format

Algorithm	Flowchart
<p>5. If (decision) Then instruction</p> <p>Else</p> <p>    If (decision) then instruction</p> <p>    Else</p> <p>        instruction</p>	<pre> graph TD     Start([Start]) --&gt; Cond1{If Condition}     Cond1 -- True --&gt; Body1[If Body]     Cond1 -- False --&gt; Cond2{Nested If Condition}     Cond2 -- True --&gt; Body2[Nested If Body]     Cond2 -- False --&gt; Body3[Nested Else Body]     Body1 --&gt; Join(( ))     Body2 --&gt; Join     Body3 --&gt; Join     Join --&gt; Statement[Statement just below if]     Statement --&gt; Exit([Exit])         </pre>
<p>6.</p>	

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### Example 3

- Write the algorithm and draw the flowchart that allow a user to input an examination mark and test it for the award of a grade. The mark is a whole number between 1 and 100. Grades are awarded according to the following criteria:

- 80–100 Distinction
- 79–60 Merit
- 59–40 Pass
- 0–39 fail

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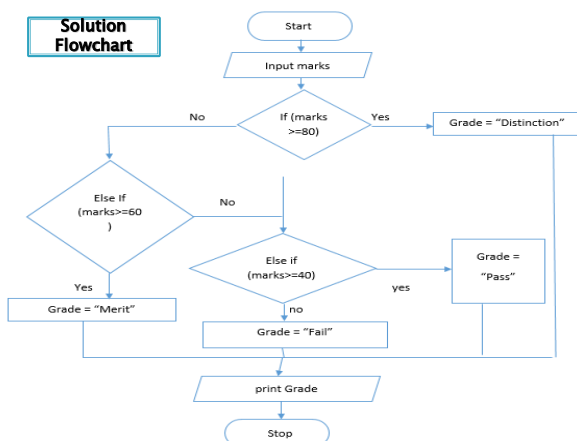
### Solution– Algorithm

- Step 1: Input Marks  
 Step 2:  
   if(marks $\geq$ 80) then  
     Grade = "Distinction"  
   else  
     if(marks $\geq$ 60) then  
       Grade = "Merit"  
     else  
       if(marks  $\geq$ 40) then  
         Grade = "Pass"  
       else  
         Grade = "Fail"  
 Step 3: Print Grade  
 Step 4: End

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#### Solution Flowchart



### Example 4

- Write the algorithm and draw the flowchart to check the larger of 2 numbers. The solution should notify the user if the 2 numbers are equal.

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## Solution Algorithm

**Step 1:** Enter a, b

**Step 2:** **if**(a>b) **Then**

    Max = a

    print Max

**else**

**if**(b>a) **Then**

        Max = b

        print Max

**else**

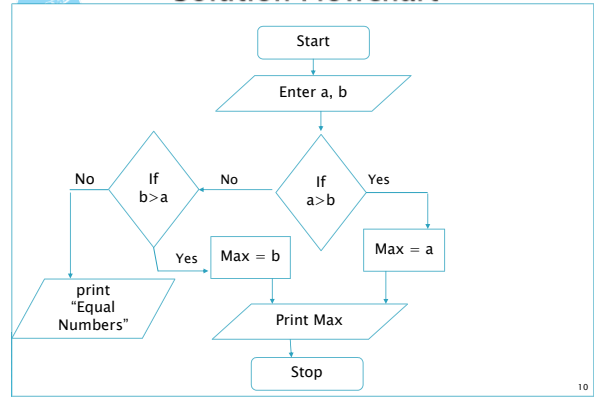
    print "Equal Numbers"

**Step 3:** End

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## Solution Flowchart



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## Brain Teaser

- Provide alternative ways to solve Example 3 and 4

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## Summary

- The decision logic structure tells the computer that If a condition is true, Then execute a set of instructions, or Else execute another set of instructions.
- **Nesting** allows multiple choices to be executed by the computer

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## Questions !!!