College of Engineering and Computer Science
Mechanical Engineering Department

California State University Northridge

Mechanical Engineering 209
Programming for Mechanical Engineers

Spring 2017 Number: 15832 Instructor: Larry Caretto

Solution to Third Quiz, March 14, 2017

1. The sub mystery shown below is applied to the spreadsheet shown at the right. What values are displayed in cells A1:A3 after the sub is run if the initial values in those cells are 1, 7, and 3?

```
Sub mystery()
  Dim a As Double
  Dim b As Double
  Dim c As Double
  a = Range("A1").Value
  b = Range("A2").Value
  c = Range("A3").Value
  If a > b Then
    If c > a Then
      Range("A1").Value = c
      Range("A2").Value = a
      Range("A3").Value = b
    ElseIf c > b Then
      Range("A1").Value = a
      Range("A2").Value = c
      Range("A3").Value = b
    Else
      Range("A1").Value = a
      Range("A2").Value = b
      Range("A3").Value = c
    End If
  Else
    If c > b Then
      Range("A1").Value = c
      Range("A2").Value = b
      Range("A3").Value = a
    ElseIf c > a Then
      Range("A1").Value = b
      Range("A2").Value = c
      Range("A3").Value = a
    Else
      Range("A1").Value = b
      Range("A2").Value = a
      Range("A3").Value = c
    End If
  End If
End Sub
```

Here a = 1, b = 7 and c = 3; a > b is false so we go to the Else statement. Here c > b is false, but c > a is true so the values in cells A1, A2, and A3, are b=7, c=3, and a=1, respectively.

Initial	A
1	1
2	7
3	3

Final	A
1	7
2	3
3	1

2. A high-school graduate is eligible for admission to a CSU campus based on high school GPA and score on the SAT or ACT tests. A student is admissible if the total of SAT + 800(GPA) ≥ 2900 or if the total of 10(ACT) + 200(GPA) ≥ 694. Write a function that accepts numerical inputs for GPA, SAT, and ACT and returns TRUE if a student is eligible and false otherwise.

```
Function CSUadmit( GPA as Double, SAT As Double, ACT _
    as Double) As Boolean
    CSUadmit = SAT + 800 * GPA >= 2900 Or 10 * ACT + _
               200*GPA >= 694
End Function
```

3. What are the results of the following expressions if the variables A, B, C, and D are all of type Boolean with initial values A = B = TRUE and C = D = FALSE?

a. **12 >= 7 And A = B** =>True and True = <u>True</u>

b. **(A And (Not B)) Or (C And (Not B))** => (True And (Not True)) Or (False And (Not False)) = (False And True) Or (True And False) = False Or False = <u>False</u>

c. **A Or D And C Or Not D** => True Or False And False Or Not False = True Or False And False Or True = True Or False Or True = True Or True = <u>True</u>

d. **15 <> 10 + 5 Or A Or D** => 15 <> 15 Or A Or D = False Or True Or False = True Or True = <u>True</u>

4. Write a function that that accepts a numerical score between 0 and 100 and returns a text string “Your score is <description>”, where <description> is “amazing” for scores ≥ 98, “wonderful” for scores ≥ 90, “good” for scores ≥ 80, “okay” for scores ≥ 60, “bad” for scores ≥ 20 and “******” for scores < 20.

```
Function message(score As Double) As String
    message = "Your score is "
    If score > 98 Then
        message = message & "amazing"
    ElseIf score >= 90 Then
        message = message & "wonderful"
    ElseIf score >= 80 Then
        message = message & "good"
    ElseIf score >= 60 Then
        message = message & "okay"
    ElseIf score >= 20 Then
        message = message & "bad"
    Else
        message = message & "******"
End Function
```