Quiz Four and Assignment Five

Larry Caretto
Mechanical Engineering 209

Computer Programming for Mechanical Engineers

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California State University Northridge

Outline

- Quiz Four Results
- Work on programming assignments
  - Assignment five due tonight
  - Assignment six due May 9

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Semester Calendar

Date	Assignment	Date	Assignment
April 25	Assignment 5 Due at 11:59 pm	April 27	
May 2	Quiz 5	May 4	
May 9	Assignment 6 Due	May 11	Programming Exam
		May 18	Final Exam 12:45 to 2:45 pm

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Quiz Four Results

- Number of students: 20
- Maximum possible score: 25
- Mean score: 9.6
- Median Score: 6
- Standard deviation: 8.25
- Grade distribution:

```
  0   0   2   2   2   2   3
    4   4   5   7  12  14
 15  16  17  17  17  23  23
```

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Quiz Four Problem One 1/5

```
Sub quiz4()
   Dim i As Integer
   Dim j As Integer
   Dim k As Integer
   k = 7
   For i = 1 To 9 Step 3
      For j = k To k + 3 Step 2
         Cells(i, j - 2) = i + j + k
      Next j
      k = k - 2
   Next i
End Sub
```

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Quiz Four Problem One 2/5

```
Sub quiz4()
   Dim i
   Dim j
   Dim k
   k = 7
   For i = 1 To 9 Step 3
      For j = k To k + 3 Step 2
         Cells(i, j - 2) = i + j + k
      Next j
      k = k - 2
   Next i
End Sub
```

	i = 1, k = 7	
	j = 7	j = 9
	Cells(1,5) = 1 + 7 + 7 = 15	Cells(1,7) = 1 + 9 + 7 = 17
	Places 15 in Cell E1	Places 17 in Cell G1

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Quiz Four Problem One 3/5

```
Sub quiz4()
   Dim i
   Dim j
   Dim k
   k = 7
   For i = 1 To 9 Step 3
      For j = k To k + 3 Step 2
         Cells(i, j - 2) = i + j + k
      Next j
      k = k - 2
   Next i
End Sub
```

i = 4, k = 5	
j = 5	j = 7
Cells(4,3) = 4 + 5 + 5 = 14	Cells(4,5) = 4 + 7 + 5 = 16
Places 14 in Cell C4	Places 16 in Cell E4

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Quiz Four Problem One 4/5

```
Sub quiz4()
   Dim i
   Dim j
   Dim k
   k = 7
   For i = 1 To 9 Step 3
      For j = k To k + 3 Step 2
         Cells(i, j - 2) = i + j + k
      Next j
      k = k - 2
   Next i
End Sub
```

i = 7, k = 3	
j = 3	j = 5
Cells(7,1) = 7 + 3 + 3 = 13	Cells(7,3) = 7 + 5 + 3 = 15
Places 13 in Cell A7	Places 15 in Cell C7

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Quiz Four Problem One 5/5

	A	B	C	D	E	F	G
1					15		17
2							
3							
4			14		16		
5							
6							
7	13		15				
8							

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Quiz Four Problem Two

```
Function sumPrimes(Start As _
  Long, Finish As Long) As Long
  Dim N As Long
  sumPrimes = 0
  For N = Start To Finish
    If isPrime(N) Then _
      sumPrimes = sumPrimes + N
  Next N
End Function
```

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Programming Assignment 5

- Start with a program that uses object code in loops to analyze data in a table
- Loops use Do While that assumes the table has no blank rows
- Assignment: modify code so that it can work with blank rows
- Requires substitution of while loop by a for loop and adding an if statement to skip blank rows

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Programming Assignment 5

- Use code provided with assignment to determine last row in table
  - This allows you to write for loop to handle all rows from first row to last row
  - Must also add code to skip blank rows
- Much of provided code uses object-oriented programming (OOP) to manipulate worksheet elements
  - No modifications needed for OOP code

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Data Table to be Analyzed

Code copies all data with common characters in positions 2-4 of run identifier onto same worksheet

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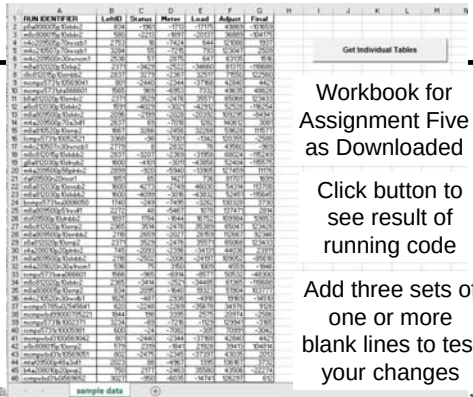

Workbook for Assignment Five as Downloaded

Click button to see result of running code

Add three sets of one or more blank lines to test your changes

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Result of Running Existing Code

	A	B	C	D	E	F	G	H
1	RUN IDENTIFIER	LeftID	Status	Meter	Load	Adjust	Final	
2	m4a209500p70a3xll1	2636.74	68.94	-7017.88	1282	140612	3080.99	
3	m4a209500p56plnkr2	2898.74	-919.52	-5939.66	-13905	127459	11176.01	
4	s4a208010p20plnkr2	744.82	-2093.38	-2395.96	-34131	44036.01	23911	
5	m4a209020n30a1ncm1	595.72	74.83	3150.34	1009	4559	-1846	
6	b4a208010p20prxjr2	749.86	2177.2	-2462.82	35580	43506	-22273.9	
7	m4a209500p56prxjr2	2904.08	1065.48	-5949.98	16326	127359	-5244.01	
8	m4a206000p10qrxjr2	513.68	1933.51	-1306.23	32719.9	28875.03	-20148	
9								
10								
11								
12								
13								
14								
15								

fcf faf 4a2 cmp 4c2 8c8 8a8 tableSheet sample data

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Use This Code in Assignment 5

- VBA code to find the last row with data in a selected column on a worksheet

```
Function getLastRow(sheetName As String, _
                    column As Long) As Long
    Dim sht As Worksheet
    Set sht = Worksheets(sheetName)
    getLastRow = sht.Cells(sht.Rows.Count, _
                    sht.column).End(xlUp).Row
    Set sht = Nothing
End Function
```

- Example: `=getLastRow("Sheet1",5)` returns number of last row with data in column E of Sheet1

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LastRow Example

	A	B	C	D	E	F	G	H
18	4.53813	9.07118	1.20214	0.00722	0.41881	0.79860	Column	LastRow
19	1.35160	0.09558	0.00516	0.67358		0.19032	1	24
20		2.32788	0.26776	2.67308			2	31
21	2.96420	6.33736	0.45038		0.79120		3	37
22	0.54770				0.59445		4	20
23	8.01893				3.40005	4.35320	5	29
24	0.11724	2.93259			2.43430	7.32871	6	34
25		4.01056			0.64125	2.29222		
26		8.28300			1.72530	0.72432		
27		1.40787	1.40651		1.41576	1.06417		
28			3.28582		1.85804	5.75726		
29		2.31549	3.62840		0.82085	0.09963		
30		0.16620	1.68254			6.04948		
31		3.49041	1.32380					
32			0.50332					
33			2.08527					
34			0.45996			0.65297		
35			0.59123					
36			0.20851					
37			4.38216					
38								

Worksheet View

	G	H
18	Column	LastRow
19	1	=getLastRow("Sheet1",G19)
20	2	=getLastRow("Sheet1",G20)
21	3	=getLastRow("Sheet1",G21)
22	4	=getLastRow("Sheet1",G22)
23	5	=getLastRow("Sheet1",G23)
24	6	=getLastRow("Sheet1",G24)

Equation View

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More on Assignment Five

- Will not have to edit object code
- Modify looping part of existing code
  - Add the getLastRow routine and apply it to find the last row in a table that may have blank rows
  - Replace a while loop, that looks at all rows in a table until a blank row is found, by a for loop to go from first row to last row
  - Use If statements to skip blank rows

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Assignment Five Subs

- **Sub getIndividualTables()**: driver
- **Sub getSeparateWorksheets()**:
- **Sub copyToWorksheets()**:
- **Function stringExists**:
- **Function deleteWorksheet**:
- Both getSeparateWorksheets() and copyToWorksheet() need modification to replace a While loop by a For loop

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```
dataRow = startDataRow
endTableRow = startTableRow - 1
Do While wksData.Cells(dataRow, dataColumn).Value
    partSubID = Mid(wksData.Cells(dataRow, dataCol
    If Not stringExists(partSubID, wksTable, start
        endTableRow = endTableRow + 1
        wksTable.Cells(endTableRow, tableColumn).V

            'Add a fresh worksheet as the destinat
            'name we are searching for and copy th
            'new worksheet.  (Delete any existing

        deleteWorksheet (partSubID)
        Set wks = Worksheets.Add
        wks.name = partSubID
        wks.Range("A1:G1").Value = wksData.Range("
        wks.Columns("A:A").ColumnWidth = 20
    End If
    dataRow = dataRow + 1
Loop
```

Module Variables/Constants

- Variables in Dim Statements and constants in Const statements may be placed before the first routine in a module
- These are called module variables and constants
- They may be assigned a value in any function or sub in the module
- Values may be used in any function/sub

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Module Variables/Constants

```
Option Explicit
Dim wksData As Worksheet
Const startDataRow As Long = 2
Const dataColumn As Long = 1
Dim wksTable As Worksheet
Const startTableRow As Long = 2
Const tableColumn As Long = 2
Dim endTableRow As Long
Sub getIndividualTables()
```

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