Homework #4
McKinney CE311K

Problem 1. Determine the output produced by the following lines of code:

```
a. txtOutput.Text = FormatNumber(-12.3456, 3)

b. txtOutput.Text = FormatNumber(5 * (10^-2), 1)
```

Problem 2. Assume that the file DATA.TXT (shown to the right of the code) has been accessed with the statement

```
Dim sr as IO.StreamReader = IO.File.OpenText("DATA.TXT")
```

And closed afterwards with the statement

```
Sr.Close().
```

Determine the output displayed by the lines of code:

```
Dim word As String
Word = sr.ReadLine
txtOutput.Text = "un" & word
```

DATA.TXT
speakable

Problem 3. Determine the output displayed by the following code:

```
Dim intRate, doublingTime As Double
DoublingTime = 72 / intRate
lstOutput.Items.Add("At the current interest rate, money will")
lstOutput.Items.Add("double in " & doublingTime & " years.")
```

(Assume that intRate is 4)

Problem 4. Write an event procedure starting with

```
Private Sub btnCompute_Click(…) Handles btnCompute.Click
```

statement, ending with an

```
End Sub
```

statement, and having one, two, or three lines for each step. Lines that display data should use the given variable names. The following steps display the changes in majors for first-year college students from 2006 to 2007. Assume that the file MAJORS.TXT consists of six lines containing the following data:

```
Elementary Education, 4.2, 4.0, Psychology, 4.8, 4.7
```

(a) Declare all variables used in the steps that follow.

(b) Open the file MAJORS.TXT for input.

(c) Use ReadLine statements to assign values to the variables `major`, `percent06`, and `percent07`.

(d) Display a sentence giving the change in the percentage of students majoring in a certain subject.

(e) Repeat steps (c) and (d).

Problem 5. The following table contains a list of colleges with their student enrollments and faculty sizes. Write a program to display the names of the colleges and their student/faculty ratios, and the ratio for the total collection of students and faculty. Assume that the data for the colleges are stored in a text file. What is the student/faculty ratio for UT Austin?

	Enrollment	Faculty
Ohio State	52568	3025
Univ. of MD, College Park	36041	2896
Princeton	7055	850

Problem 6. Determine whether the condition is true or false. Assume a = 2 and b = 3.

a.)   (a*a < b) OR Not (a*a < a)

b.)   Not (a < b) OR Not (a < (b + a))

c.)   ((a = b) OR Not (b < a)) AND ((a < b) OR (b = a +1))

Problem 9. Write a condition equivalent to the negation of the given condition. (For example, a <> b is equivalent to the negation of a = b).

    Not ((a = b) OR (a > b))

Problem 10. Determine the output displayed in the text box when the button is clicked.

```
Private Sub btnDisplay_Click(…) Handles btnDisplay.Click
     Dim change As Double = 356    'Amount of change in cents
     If change >= 100 Then
          txtOutput.Text = "Your change contains " & _
                            Int(change / 100) & " dollars."
     Else
          txtOutput.Text = "Your change contains no dollars."
     End If
End Sub
```

Problem 11. Federal law requires hourly employees to be paid "time-and-a-half" for work in excess of 40 hours per week. For example, if a person's hourly wage is $8 and he works 60 hours in a week, his gross (before tax) pay would be (40 X 8) + (1.5 X 8 X (60-40)) = $560.

Write a program that requests as input the number of hours a person works in a given week and his/her hourly wage, and then displays the gross pay.

Problem 12. For each of the responses shown in parentheses, determine the output displayed in the text box when the button is clicked. (1940, 1945, 1950)

```
Private Sub btnDisplay_Click(…) Handles btnDisplay.Click
    Dim yearENIAC As Integer
    Dim message As String
    Message = "In what year was the ENIAC computer completed?"
    yearENIAC = CInt(InputBox(message))
    Select Case yearENIAC
        Case 1945
            txtOutput.TEXT = "Correct."
        Case 1943 To 1947
            txtOutput.TEXT = "Close, 1945."
        Case Is < 1943
            txtOutput.TEXT = "Sorry, 1945.  Work on the ENIAC " _
                                began in June 1943."
        Case > 1947
            txtOutput.TEXT = "No, 1945.  By then IBM had built " _
                                a stored-program computer."
    End Select
End Sub
```