Input Output Problems

**Problem 1.** Text, page 107, Problems 2 and 6

2. –12.346
6. 0.1

**Problem 2.** Text, page 110, Problem 44

44. 60

**Problem 3.** Text, page 112, Problem 56

56. At the current interest rate, money will double in 18 years.

**Problem 4.** Text, page 113, Problem 68

```vbscript
Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
    Dim major As String, percent06, percent07 As Double
    Dim sr As IO.StreamReader = IO.File.OpenText("MAJORS.TXT")
    major = sr.ReadLine
    percent03 = CDbl(sr.ReadLine)
    percent04 = CDbl(sr.ReadLine)
    lstOutput.Item.Add("From 2006 to 2007, the percentage of " & major)
    lstOutput.Item.Add("majors increased by " & (percent04 – percent03))
    lstOutput.Item.Add("percentage points.")
    major = sr.ReadLine
    percent03 = CDbl(sr.ReadLine)
    percent04 = CDbl(sr.ReadLine)
    lstOutput.Item.Add("From 2006 to 2007, the percentage of " & major)
    lstOutput.Item.Add("majors increased by " & (percent07 – percent06))
    lstOutput.Item.Add("percentage points.")
End Sub
```
Problem 5. Text, page 114, Problem 78

Private Sub btnDisplay_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles btnDisplay.Click
'Calculate student-to-faculty ratio for 3 universities.
Dim univ As String
Dim students, faculty As Double
Dim totalStudents, totalFaculty As Double
Dim ratio, totalRatio As Double
Dim fmtStr = "{0, -29} {1, 15:N1}"
Dim sr As IO.StreamReader = IO.File.OpenText("3-3-E78.TXT")
lstOutput.Items.Clear()
lstOutput.Items.Add(String.Format(fmtStr, "University", "Ratio"))

'1st university
univ = sr.ReadLine
students = CDbl(sr.ReadLine)
faculty = CDbl(sr.ReadLine)
ratio = students / faculty
totalStudents = students
totalFaculty = faculty
lstOutput.Items.Add(String.Format(fmtStr, univ, ratio))

'2nd university
univ = sr.ReadLine
students = CDbl(sr.ReadLine)
faculty = CDbl(sr.ReadLine)
ratio = students / faculty
totalStudents += students
totalFaculty += faculty
lstOutput.Items.Add(String.Format(fmtStr, univ, ratio))

'3rd university
univ = sr.ReadLine
students = CDbl(sr.ReadLine)
faculty = CDbl(sr.ReadLine)
ratio = students / faculty
totalStudents += students
totalFaculty += faculty
lstOutput.Items.Add(String.Format(fmtStr, univ, ratio))
Logical Operator Problems

Problem 6. Text, page 127, Problem 14

\[ a = 2, \ b = 3 \]

\[(a \times a < b) \text{ OR } \neg (a \times a < a) \]
\[(2 \times 2 < 3) \text{ OR } \neg (2 \times 2 < 2) \]
\[(F) \text{ OR } \neg (F) \]
\[(F) \text{ OR } (T) \]
\[T \]
\[True\]

Problem 7. Text, page 127, Problem 16

\[ a = 2, \ b = 3 \]

\[\neg (a < b) \text{ OR } \neg (a < (b + a)) \]
\[\neg (2 < 3) \text{ OR } \neg (2 < (3 + 2)) \]
\[\neg (T) \text{ OR } \neg (2 < 5) \]
\[\neg (T) \text{ OR } \neg (T) \]
\[F \text{ OR } F \]
\[False\]

Problem 8. Text, page 127, Problem 18

\[((a = b) \text{ OR } \neg (b < a)) \text{ AND } ((a < b) \text{ OR } (b = a + 1)) \]
\[((2 = 3) \text{ OR } \neg (3 < 2)) \text{ AND } ((2 < 3) \text{ OR } (3 = 2 + 1)) \]
\[(F \text{ OR } \neg (F)) \text{ AND } (T \text{ OR } T) \]
\[(F \text{ OR } T) \text{ AND } (T \text{ OR } T) \]
\[(T) \text{ AND } (T) \]
\[True\]

Problem 9. Text, page 128, Problem 44

Write a condition equivalent to the negation of the given expression:
\[\neg ((a = b) \text{ OR } (a > b)) \]
\[(a = b) \text{ OR } (a > b) \]
If-Block Problems

Problem 10. Text, page 137, Problem 4

Your change contains 3 dollars.

Problem 11. Text, page 143, Problem 36

![Image of a computer interface showing gross pay calculation]

Private Sub btnCompute_Click(ByVal sender As System.Object,
   'Compute gross pay, including "time-and-a-half"
   'for overtime
   Dim wage, hours, grossPay As Double
   wage = CDbl(txtHourlyWage.Text) 'Hourly pay
   hours = CDbl(txtHoursWorked.Text) 'Hours worked
   If hours <= 40 Then
       grossPay = wage * hours
   Else
       grossPay = (wage * 40) + (1.5 * wage * (hours - 40))
   End If
   txtGrossPay.Text = FormatCurrency(grossPay)
End Sub

Problem 12. Text, page 156, Problem 4

Correct.
No, 1945. By then IBM had built a stored-program computer.