

### Homework #3 McKinney CE311K

**Problem 1.** Convert the following binary numbers to decimal representation:

- a)  $0011\ 0011_2 = 51$
- b)  $1010\ 1001_2 = 169$
- c)  $1100\ 1001\ 0011_2 = 3219$

**Problem 2.** Convert the following decimal numbers to binary representation:

- a)  $42 = 0010\ 1010_2$
- b)  $255 = 1111\ 1111_2$
- c)  $300 = 0001\ 0010\ 1100_2$

**Problem 3.** What decimal values can be represented using one bit? one nibble? one byte? one word?

One bit can represent decimal values 0 or 1.

One nibble can represent decimal values 0 through 15.

One byte can represent decimal values 0 through 255.

One word can represent decimal values 0 through 65535.

In general,  $n$  bits can represent decimal values 0 through  $2^n - 1$ .

**Problem 4.** Perform the following binary additions:

- a)  $0100\ 1101_2 + 1010\ 0011_2 = 1111\ 0000_2$
- b)  $0101\ 1101_2 + 0000\ 0011_2 = 0110\ 0000_2$
- c)  $1111\ 1111_2 + 1111\ 1111_2 = 0001\ 1111\ 1110_2$

**Problem 5.** Write Visual Basic code for a program that will accept a person's first name and last name in separate text boxes and, when a "Go!" button is pressed, print the first and then last name in a third text box.

NOTE: For extra credit, program your answer in VB and include screen shots of the code and running program in your homework paper.

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
    Dim first, last As String
    first = TextBox1.Text
    last = TextBox2.Text
    TextBox3.Text = first & " " & last
End Sub
```

**Problem 6.** Write Visual Basic code for a program that will accept a vehicle's distance and speed and in separate text boxes and, when a "Go!" button is pressed, print the time traveled of the vehicle in a third text box.

NOTE: For extra credit, program your answer in VB and include screen shots of the code and running program in your homework paper.

```
Private Sub Button1_Click(ByVal sender As System.Object
    TextBox3.Text = TextBox1.Text / TextBox2.Text
End Sub
```

**Problem 7.** Text, Page 71, Problems 8 and 10

a. Problem 8

$$14 \text{ Mod } 4 = 4 \overline{)14}^3 \quad R2 = 2$$

**b.** Problem 10

$$14 \setminus 4 = 3$$

**Problem 8.** Text, Page 71, Problem 12. Not valid (& not allowed)

**Problem 9.** Text, Page 71, Problems 14, and 16

**a.** Problem 14. Not valid

**b.** Problem 16. Not valid

**Problem 10.** Text, Page 72-73, Problem 32

$$A = 4$$

$$B = 5 * A = 20$$

$$\text{Output} = A + B = 24$$

**Problem 11.** Text, Page 73, Problem 38

$$3 * n = 3 * 2 = 6$$

$$n = n + n = 2 + 2 = 4$$

$$n + m = 4 + 5 = 9$$

$$n - m = 4 - 5 = -1$$