**CSc 1301: PRINCIPLES OF COMPUTER SCIENCE**

**Lab 4**

**Name: \_\_Hakan (John) Gunerli\_\_\_\_\_\_ Lab time: \_\_\_3PM-4:40PM\_\_\_\_\_**

**How to Submit**

Please submit your answers on iCollege once you have completed (by the same day with lab time).

Failure to submit will result in a **ZERO FOR THIS LAB. NO EXCEPTIONS**.

Complete the following problems for the other values and show work

**Decimal Hexadecimal Binary**

1. 101110102 \_\_\_\_\_\_\_186\_\_ \_\_\_\_\_\_\_BA\_\_\_\_\_\_\_\_ n/a

1st= 2

3rd = 8

4th = 16

5th= 32

7th= 128

(1 × 2⁷) + (1 × 2⁵) + (1 × 2⁴) + (1 × 2³) + (1 × 2¹) =186

Hexa 186/16 = remainder 11 = B

Remainder \* 16= 10 = A

1. 111100112 \_\_\_\_\_\_243\_\_\_\_\_\_\_\_ \_\_\_\_\_\_F3\_\_\_\_\_\_\_\_\_ n/a

1st = 2

4th = 16

5th =32

6th =64

7th =128

(1 × 2⁷) + (1 × 2⁶) + (1 × 2⁵) + (1 × 2⁴) + (0 × 2³) + (0 × 2²) + (1 × 2¹) + (1 × 2⁰)

243/16= 15 = F

Remainder= .1875\*10=3 = 3

1. 101010102 \_\_\_\_\_170\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_AA\_\_\_\_\_\_\_\_\_ n/a

1st=2

3rd= 8

5th = 32

7th = 128

(1 × 2⁷) + (1 × 2⁵) + + (1 × 2³) + (1 × 2¹) =170

1. 110110112 \_\_\_\_\_\_219\_\_\_\_\_\_\_\_\_ \_\_\_\_\_DB\_\_\_\_\_\_\_\_\_ n/a

0th= 1

1st=2

3rd= 8

4th = 16

6th = 64

7th = 128

(1 × 2^7) +(1 × 2^6 ) + (1 × 2^4) + (1 × 2^3) + (1 × 2^1) + (1 × 2^0)= 219

219/16= 13

.6875 \* 16= 11

1. 2E916 \_\_\_\_\_\_\_745\_\_\_\_\_\_\_\_ \_\_\_\_\_n/a\_ \_\_\_\_1011101001\_\_\_\_\_\_

Decimal = 2 \* 16^2 + 14\* 16^1 + 9\*16^0 = 745

Hex 2= 10

Hex E = 1110

Hex 9= 1001

2E9 =1011101001

1. ACE16 \_\_\_\_\_\_\_2766\_\_\_\_\_\_\_\_ \_\_\_\_\_\_n/a\_\_\_\_\_\_\_\_\_ \_\_\_\_10011001110\_\_\_

Hex A= 1010

Hex C= 1100

Hex E = 1110

Binary = 101011001110

(10\*256)+(12\*16)+(14\* 1)= 2766

1. Write an algorithm to convert a whole decimal numeral to any base

Declare *rem\_value*, using as a remainder here initially zero.

Declare *dec\_value* as the decimal value initially zero.

Declare *result\_division* as the result of the division initially zero.

Declare *­base\_num* as the base of the number we are trying to achieve initially zero. (given by the user )

Declare *answer* as the answer for the question.

Repeat the procedure until *dec\_value* becomes zero:

Divide *dec\_value* / *­base\_num ,* declare the result as *result\_division*

The remainder of the operation declare that as the number of the very left on *answer* variable.

Let the *result\_division be the* new *dec\_value* .

1. Prove your Algorithm with the decimal number 45 into binary

Begin program.

*dec\_value* = 45

­*base\_num*= 2

45 (*dec\_value* )/ 2 (*base\_num*) = 22(*result\_division*) , *rem\_value=*1 (value exists*) , answer* is 1, new *dec\_value* becomes 22.

**repeat until procedure has not been reached yet.**

22 (*dec\_value* )/ 2 (*base\_num*) = 11(*result\_division*) ) , *rem\_value=*0 (value does not exist*) , answer* is 01, new *dec\_value* becomes 11.

repeat until procedure has not been reached yet..

11 (*dec\_value* )/ 2 (*base\_num*) = 5(*result\_division*) *rem\_value=*1 (value exist*) , answer* is 101, new *dec\_value* becomes 5.

repeat until procedure has not been reached yet..

5 (*dec\_value* )/ 2 (*base\_num*) = 2 (*result\_division*) *rem\_value=*1 (value exist*, answer* is 1101, new *dec\_value* becomes 2.

repeat until procedure has not been reached yet..

2 (*dec\_value* )/ 2 (*base\_num*) = 1(*result\_division*) (value does not exist*) , answer* is 01101, new *dec\_value* becomes 1.

repeat until procedure has not been reached yet..

1 (*dec\_value* )/ 2 (*base\_num*) = 0(*result\_division*) , *rem\_value=*1 (value exists*) , answer* is 101101, new *dec\_value* becomes 0.

Program quits because the repeat until procedure has been reached.

end , answer= 101101