Gebze Technical University

Department of Computer Engineering

CSE 101 – Introduction to Computer Engineering

HW #1

Due date: 20/10/2018 – 09:00

1. Convert the following hexadecimal numbers to binary and binary numbers to hexadecimal. Separate each 4 bit from each other with a space character when converting to binary.
   a) 8A9 **(1000 1010 1001)**
   b) EF3 **(1110 1111 0011)**
   c) 0001 1110 0001 **(1 E 1)**
   d) 1111 1110 1101 1011 **(F E D B)**

2. Below is a mesage first coded in ASCII and then converted to hexadecimal. Decode the message and show your steps.

43 6F 6D 70 75 74 65 72

(C o m p u t e r)

I firstly converted the hexadecimal version and then I found characters that correspond to hexadecimal by checking the ASCII Table.Perform the mathematical operations below by converting each decimal into a 5-bit two's complement format. Check your results by doing the same operations in decimal format. Specify which of the operations causes an overflow.

3. Perform the mathematical operations below by converting each decimal into a 5-bit two's complement format. Check your results by doing the same operations in decimal format. Specify which of the operations causes an overflow.

a) 5 – 1=

```
  01010 (5)
+ 11111 (-1)
-------
  00100 (There is no overflow) Result is (+4) in decimal.
```

5 – 11=

```
  00101 (5)
+ 10101 (-11)
-------
  11010 (There is no overflow) Result is (-6) in decimal.
```

4. Perform the following operations.

   a. 01001011 **AND** 10101011 = **(00001011)**

   b. 01001011 **OR** 10101011 = **(11101011)**

c. 01001011 XOR 10101011 = (11100000)

5. The followings are the instructions according to the machine language given in the appendix of your text book (Appendix C). Find the corresponding assembly commands.

a) 7123 *(instruction)*

(Make OR operation between R2 and R3 , then place in Register1 { OR R1 ,R2,R3 }

00000010

OR 00000011

00000011 (Which is "3" in decimal and this number will be loaded R1)

b) 2BCD *(instruction)*

(This instruction mentions about loading.But a little bit different.We are going to load directly value of "CD" in 8 bits format to Register B(RB).

{ LOAD RB , CD }

6.Write an assembly program which obtains a 8 bit value by combining the first and last 4 bits of the memory cellss addressed with A0 and A1, respectively and writes this 8 bit value into the memory address A2.

```
LOAD R0,5h        (I just gave numbers ,which are going to be stored in the memory , randomly.)
LOAD R1,4h        (Those numbers are for just testing in Simpsim.)
```

```
STORE R0 ,[0XA0]
STORE R1 ,[0XA1]
LOAD R3,0XF0
LOAD R4,0X0F
AND R0,R0, R3     (I have masked [0xA0] with 0xF0 to load first 4 bit of A0)
AND R1,R1, R4     (I have masked [0xA1] with 0x0F to load last 4 bit of A1)
OR  R5 ,R0,R1
STORE R5,[0XA2]
HALT
```

Owner of the Homework:

NEVZAT SEFEROĞLU (171044024)