Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

Course No: CSE2214
Course Title: Assembly Language Programming Sessional
Assignment No: 02

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Submitted To: Ms.Tahsin Aziz & Md. Siam Ansary

Submitted by-

Group: C_1
Name: Noman Ahmed
Id: 18.01.04.108
Section: C

Question No: 01

Question: Suppose that a byte contains the ASCII code of a lower case letter. What hex number should be added to/subtracted from it to convert it to upper case?

Answer: We know that, the ASCII value of lower case "A" in hexadecimal is 61 and the ASCII value of upper case "A" in hexadecimal is 41. So the ASCII value difference between lower case and upper case letters in hexadecimal is 20. Therefore, 20 hex number should be subtracted from it to convert it to upper case.

Question No: 02

Question: For each of the following 16-bit signed numbers, tell whether it is positive or negative.

     a) 9AC4h

     b) 78E3h

Answer: If the MSB (Most Significant Bit) is 0 then number became positive, and if it became 1 then the number will be negative.

     a) 9AC4h = 1001 1010 1100 0100b

         Here, the MSB is 1. Therefore, the number is a negative number.

     b) 78E3h = 0111 1000 1110 0011b

         Here, the MSB is 0. Therefore, the number is a positive number.

Question No: 03

Question: Give the unsigned and signed decimal interpretations of each of the following 16-bit or 8bit numbers.

     a) 7FFEh

     b) A9h

Answer: If the MSB of a given hex number is between 0 to 7, then both the unsigned and signed number are same. Else the signed number will be equal to the difference of 256 from equivalent decimal number. And the unsigned number remains same.

     a) 7FFEh = $(7 \times 16^3) + (15 \times 16^2) + (15 \times 16^1) + (14 \times 16^0)$

               = 28672 + 3840 + 240 + 14

               = 32766d

         Here the MSB of the given hex number is 7. Therefore, both the signed and unsigned decimal interpretations are 32766d.

b) $A9h = (10 \times 16^1) + (9 \times 16^0)$

$\qquad = 160 + 9$

$\qquad = 169d$

Hence, the unsigned decimal interpretation is 169d.

Since, the MSB of the given hexadecimal number is A(10) > 7.

Therefore, the unsigned interpretations is = (169 – 256)d or, -87d.

Hence, the signed decimal interpretation is -87d.

Question No: 04

Question: Perform the following additions.

a) 00101b + 10111b

b) 100111101b + 10001111001b

c) B23CDh + 17912h

d) FEFFEh + FBCADh

Answer:

a) 00101b + 10111b

$\qquad$ 0 0 1 0 1 b

$\qquad$ 1 0 1 1 1 b

$\qquad$ 1 1 1 0 0 b

b) 100111101b + 10001111001b

$\qquad$ 1 0 0 1 1 1 1 0 1 b

$\qquad$ 1 0 0 0 1 1 1 1 0 0 1 b

$\qquad$ 1 0 1 1 0 1 1 0 1 1 0 b

c) B23CDh + 17912h

$\qquad$ B 2 3 C D h

$\qquad$ 1 7 9 1 2 h

$\qquad$ C 9 C D F h

d) FEFFEh + FBCADh

$\qquad$ F E F F E h

$\qquad$ F B C A D h

$\qquad$ 1 F A C A B h