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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Question No: 01

Question: Suppose that a byte contains the ASCII code of an uppercase letter. What hex number should be added to it to convert it to lower case.

Answer: Let,

an uppercase letter = 'A'

The ASCII code of 'A' is 065.

and " " " " 'a' " 097.

∴ The difference is = (097 − 065) = 032

Again, The ASCII code of 'B' is 066

and " " " 'b' " 098

∴ The difference is = (098 − 066) = 032.

Again, The ASCII code of 'Z' is 090

and " " " 'z' " 122

∴ The difference is = (122 − 090) = 032

So, we can say that the difference will be same for every alphabet.

∴ The difference is = $(032)_{10}$

To convert it in hexadecimal.

16 | 32
16 | 2 — 0 ↑
0 — 2

So, the hexadecimal value is $(20)_{16}$

So, we have to add $(20)_{16}$ to convert an uppercase letter to lowercase letter.

Question No: 02

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

2.1. 78E3h
2.2. 9AC4h

Answer: Firstly, for 78E3h,

we will convert it into binary numbers and then checked the MSB bit and tell whether it is positive or negative.

7 8 E 3
↙ ↓ ↓ ↘
0111 1000 1110 0011

$\therefore (78E3h) = (0111100011100011)_2$
↓
0 → Positive.

As, the MSB bit 0, so it is a Positive Number

Now, for 9AC4h,
We will follow the same Procedure as before:

9 A C 4
↙ ↓ ↓ ↘
1001 1010 1100 0100

$\therefore (9AC4h) = (1001101011000100)_2$
↓
1 → negative.

As the MSB bit is 1, so this is a negative number.

Question No: 03

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

3.1. 7FFEh

3.2. 7Fh

Answer: Firstly for 7FFEh,

For unsigned,

$$(7FFE)_{16} = (?)_{10}$$

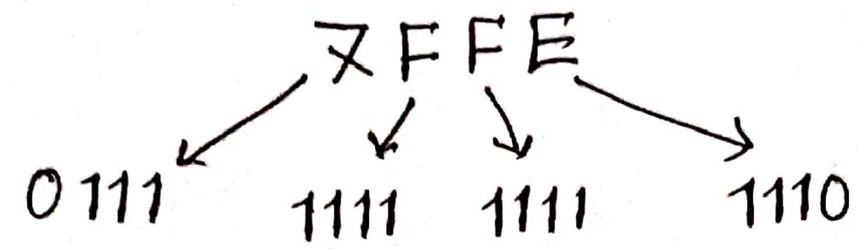
$$= (7 \times 16^3) + (F \times 16^2) + (E \times 16^1) + (E \times 16^0)$$

$$= (7 \times 16^3) + (15 \times 16^2) + (15 \times 16) + 14$$

$$= (32766)_{10}$$

∴ The decimal is $(32766)_{10}$

For signed, we will convert it to binary and check the MSB bit whether it is '0' or '1'.



$\therefore (7FFE)_{16} = (0111\ 1111\ 1111\ 1110)_2$

↳ 0 → Positive.

As, the MSB bit is '0', so this is a Positive number. So, the decimal value will be same for signed and ~~uns~~ unsigned.

So, the decimal value is $(32766)_{10}$.

Now, For 7Fh,

For unsigned,

$(7F)_{16} = (?)_{10}$

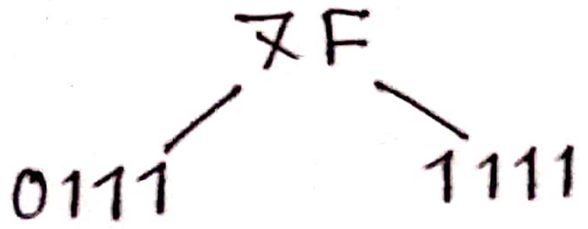
$= (7 \times 16^1) + (F \times 16^0)$

$= (7 \times 16) + (15 \times 1)$

$= (127)_{10}$

$\therefore$ The decimal value is $(127)_{10}$.

For signed, we will follow the same Procedure as before.



$\therefore (7F)_{16} = (01111111)_2$

↓

0 → Positive.

As the MSB bit is '0', so this is also a Positive number. So the decimal value will be same for signed and unsigned.

So, the decimal value is $(127)_{10}$.