**Lecture three: Arithmetic operation**

**Arithmetic operation :**

**1-Binary addition** :

Carry sum

0 + 0 = 0

0 + 1 = 1

1 + 0 = 1

1 + 1 = 1 0

***EX:***

1 1 1

11 100 111 110

+11 + 10 + 11 +100

110 110 1010 1010

**2-Binary subtraction :**

0 – 0 = 0

1 – 1 = 0

1 – 0 = 1

10 0 – 1 = 1 with borrow 1

***EX:***

10 10

1. 11 101 110

-01 -10 -011 -101

10 01 010 001

**3-Binary multiplication** :

0 x 0 = 0

0 x 1 = 0 the same manner as in Decimal

1 x 0 = 0

1 x 1 = 1

***EX:***

11 111

X 11 x 101

11 111

+ 11 + 000

1001 111

100011

**Hexadecimal addition :**

***EX:***

23 58 2B

+16 +22 +84

39H 7AH  AFH

***EX:***  1

D F 15D + 12D = 27D 27D -16D = 11D = BH with 1 carry

+A C

18 B

1 + 13D + 10D = 24D 24D – 16D = 8D = 8H with 1 carry

**Octal addition :**

***EX:***

14

+23

37o

***EX:***

3 7 7O + 3O = 10D – 8D = 2D = 2O + 1 carry

+ 5 3

11 2

1 + 3O + 5O = 9D – 8D = 1D = 1O + 1 carry