**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