Tutorial - I

Convert Decimal to Binary.

1. 244

2	244	0
2	122	0
2	61	1
2	30	0
2	15	1
2	7	1
2	3	1
	1	1
	0	

$$244 = (11110100)_2$$

2. 61

2	61	1
2	30	0
2	15	1
2	7	1
2	3	1
2	1	1
	0	

$$61 = (111101)_2$$

Convert Decimal to Octel

1. 54

8	54	6
8	6	6
	0	

$$54 = (66)_8$$

2. 122

8	122	2
8	15	7
8	1	1
	0	

$$122 = (172)_8$$

Convert Decimal to Hexadecimal

1.   345   2.   2598

16	345	9
16	21	5
16	1	1
	0	

16	2598	6
16	162	2
16	10	10 = A
	0	

345 = $(159)_{16}$ 2598 = $(A26)_{16}$

Convert Binary to Decimal

1.   1000110

$= (0 \times 2^0) + (1 \times 2^1) + (1 \times 2^2) + (0 \times 2^3) + (0 \times 2^4) +$
$(0 \times 2^5) + (1 \times 2^6)$

$= (0 \times 1) + (1 \times 2) + (1 \times 4) + (0 \times 8) + (0 \times 16) +$
$(0 \times 32) + (1 \times 64)$

$= 0 + 2 + 4 + 0 + 0 + 0 + 64$

$= 70$

2.   10111

$= (1 \times 2^0) + (1 \times 2^1) + (1 \times 2^2) + (0 \times 2^3) + (1 \times 2^4)$

$= 1 + 2 + 4 + 0 + 16$

$= 23$

Convent octel to decimal

1. 123

$= (3 \times 8^0) + (2 \times 8^1) + (1 \times 8^2)$

$= 3 + 16 + 64$

$= 83$

2. 465

$= (5 \times 8^0) + (6 \times 8^1) + (4 \times 8^2)$

$= 5 + 48 + 256$

$= 309$

Convent Hexadecimal to decimal

1. 239

$= (9 \times 16^0) + (3 \times 16^1) + (2 \times 16^2)$

$= 9 + 48 + 512$

$= 569$

2. 647

$= (7 \times 16^0) + (4 \times 16^1) + (6 \times 16^2)$

$= (7 \times 1) + (4 \times 16) + (6 \times 256)$

$= 7 + 64 + 1536$

$= 1607$

Represent below number using 1's complement

1. 10101010
   01010101

2. 00101101
   11010010

Represent below number using 2's complement

1. 11000110
   00111001
   Add1: 00110010
   2'Com: 00111 0010

2. 10100110
   01011001
   Add 1 :- 01011 0010
   2'com :- 01011 0010

Represent below negative number using 1's complement

1. -7
   Absolute Value: 7
   Binary :- 0111
   1's com :- 1000

2. -5
   Absolute Value: 5
   Binary :- 0101
   1's com :- 1010

Represent below negative number using 2's complement

1. -7
Absolute Value : 7
Binary :- 0111
Invent Bits :- 1000
Add :- 1001
2'com :- 1001

2. -5
Absolute Value : 5
Binary : 0101
Invent bits : 1010 , Add : 1011
2'com : 1011

Represent below negative number using Signed negative

1. -7
Absolute value : 7
Binary : 0111
Signed Bit : 1
Signed negative : 10111

2. -6
Absolute Value : 6
Binary : 0110
Signed bit : 1
Signed negative :- 10110

Represent below negetive number using 1's complement

1. -7

Absolute Value: 7

Binary: 00 000111 (assuming 8 bits)

1's Com: 11111000

2. -5

Absolute Value : 5

Binary : 00000101

1's com : 11111010

Represent below negetive number using 2's complement

1. -7

Absolute Value: 7

Binary : 00000111 (assuming 8 bits)

Add 1: 11111001

2's com: 11111001

2. -5

Absolute Value: 5

Binary : 00000101 (assuming 8 bits)

Invent bits: 11111010

Add 1:- 11111011

2's com: 11111011

find $(R-1)'s$ complement of 432 Base 6

432 in base 6   find the max possible digits 6-1

$5 - 4 = 1$

$5 - 3 = 2$

$5 - 2 = 3$

4 32 in base 6 is 123

find R's complement of 835 Base 10

835 in base 10 find the max possible in digit base 10-1

$9 - 8 = 1$

$9 - 3 = 6$

$9 - 5 = 4$

835 in base 10 is 164