Arnav Surve

CNIT 176

Lab 07

10/13/2022

Question 1a: Determine the unsigned binary encoding of the number 137

10001001

Question 1b: Determine the unsigned binary encoding of the number 225

11100001

Question 1c: Determine the unsigned binary encoding of the number 212

11010100

Question 1d: Convert the following binary number to hexadecimal (hint: use 4-bit nibbles): 1110 1101 1100 1010 1101 0100 1011 0000

EDCAD4B0

Question 1e: Convert the following binary number to octal (hint: use 3-bit groups): 110 011 101 111

6357

Question 1f: Convert the following hexadecimal number to decimal: B3EF

46063

Question 1g: Determine the signed magnitude binary encoding of the number 181.

110110101

Question 1h: Determine the signed magnitude binary encoding of the number −181.

010110101

Question 1i: Find the one's complement of the positive binary number 10010110 to encode the negative quantity.

01101001

Question 1j: Find the two's complement of the positive binary number 00101110 to encode the negative quantity.

11010010

<u>Question 2a:</u>

7 = 0111 –7 = 1001

7 = 00000111 –7 = 11111001

2b:

103 = 01100111 –103 = 10011001

103 = 0000000001100111 –103 = 1111111110011001

Question 3:

01000011 = 67

11011001 = -39

11010010 = -46

10011011 = -101

10011101 = -99

01010100 = 84

10101001 = -87

Question 4:

	Binary	Octal	Hexadecimal
0	0	0	0
1	1	1	1
2	10	2	2
3	11	3	3
4	100	4	4
5	101	5	5
6	110	6	6
7	111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F
16	10000	20	10
17	10001	21	11
18	10010	22	12
19	10011	23	13

20	10100	24	14
21	10101	25	15
22	10110	26	16
23	10111	27	17
24	11000	30	18
25	11001	31	19
26	11010	32	1A
27	11011	33	1B
28	11100	34	1C
29	11101	35	1D
30	11110	36	1E
31	11111	37	1F
32	100000	40	20

Question 5:

$2_{10} = 10_2$

$8_{10} = 10_8$

$16_{10} = 10_{16}$

Question 6:

$2 \cdot 10_{10} = 20_{10}$

$3 \cdot 10_{10} = 30_{10}$

$4 \cdot 10_{10} = 40_{10}$

$5 \cdot 10_{10} = 50_{10}$

$2 \cdot 2_{10} = 100_2$

$3 \cdot 2_{10} = 110_2$

$4 \cdot 2_{10} = 1000_2$

$5 \cdot 2_{10} = 1010_2$

$2 \cdot 8_{10} = 20_8$

$3 \cdot 8_{10} = 30_8$

$4 \cdot 8_{10} = 40_8$

$5 \cdot 8_{10} = 50_8$

$2 \cdot 16_{10} = 20_{16}$

$3 \cdot 16_{10} = 30_{16}$

$4 \cdot 16_{10} = 40_{16}$

$5 \cdot 16_{10} = 50_{16}$

In general, the multiples of a base follow the pattern of increasing by 10 for each radix, excluding binary.

Question 7:

$10_{10}\text{^}2 = 100_{10}$

$10_{10}\text{^}3 = 1000_{10}$

$10_{10}\text{^}4 = 10000_{10}$

$10_{10}\text{^}5 = 100000_{10}$

$2_{10}\text{^}2 = 10_2$

$2_{10}\text{^}3 = 100_2$

$2_{10}\text{^}4 = 1000_2$

$2_{10}\text{^}5 = 10000_2$

$8_{10}\text{^}2 = 100_8$

$8_{10}\text{^}3 = 1000_8$

$8_{10}\text{^}4 = 10000_8$

$8_{10}\text{^}5 = 100000_8$

$16_{10}\text{^}2 = 100_{16}$

$16_{10}\text{^}3 = 1000_{16}$

$16_{10}\text{^}4 = 10000_{16}$

$16_{10}\text{^}5 = 100000_{16}$

In general, the powers of a base increase by a magnitude of 10 for each radix. All the above bases follow this rule.