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Assignment 1

Q1

1. Servers
2. Terabyte
3. Petabyte
4. Supercomputers
5. CPU
6. Multicore processors
7. Embedded computer
8. Desktop computer
9. Compiler
10. Assembler
11. Machine language
12. Instructions
13. Assembly language
14. Operating System
15. Bit
16. High-level language

Q2

1) $(4096)_{10} \rightarrow (?)_{16} \Longrightarrow (4096)_{10} \rightarrow (1000)_{16}$

First, find $(4096)_{10} \rightarrow (?)_2$ then use that to find answer:

4096	2048	1024	512	256	128	64	32	16	8	4	2	1
1	0	0	0	0	0	0	0	0	0	0	0	0

0 0 0 1 0 0 0

1 0 0 0

2) $(-2046)_{10} \longrightarrow (?)_{16}$

Unsigned:

1024	512	256	128	64	32	16	8	4	2	1
1	1	1	1	1	1	1	1	1	1	0

Positive: 0111 1111 1110

1's complement: 1000 0000 0001

2's complement:

$$\begin{array}{r} 1000\ 0000\ 0001 \\ +\ 0000\ 0000\ 0001 \\ \hline 1000\ 0000\ 0010 \\ 8\quad 0\quad 2 \end{array}$$

Store it in 16-bit, just add 1's to fill remaining bits:

$$\underbrace{1111}_{F}\ \underbrace{1000}_{8}\ \underbrace{0000}_{0}\ \underbrace{0010}_{2}$$

$(-2046)_{10} \rightarrow (F802)_{16}$

3) $(4096)_{16} \rightarrow (?)_{10}$

4096	256	16	1
4	0	9	6

$\longrightarrow$ $4096(4) + 16(9) + 6 = 16,534$

$(4096)_{16} \rightarrow (16,534)_{10}$

4) $(1110\ 1110\ 0001\ 0001)_2 \rightarrow (?)_{10}$

1st digit is one, negative number

1110 1110 0001 0001

1's : 001 0001 1110 1110

~~2's : 110 1110 0001 0010~~

16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2	1
0	0	1	0	0	0	1	1	1	1	0	1	1	1	0

$= 4096 + 256 + 128 + 64 + 32 + 8 + 4 + 2 = 4590$

Since ~~the~~ first digit is 1, it's -4590

$(1110\ 1110\ 0001\ 0001)_2 \rightarrow (-4590)_{10}$

5) $(1010\ 1001\ 1110\ 0101)_2 \rightarrow (?)_{16}$

A 9 E 5

0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9

1010	A
1011	B
1100	C
1101	D
1110	E
1111	F

$(1010\ 1001\ 1110\ 0101)_2 \rightarrow (A9EF)_{16}$

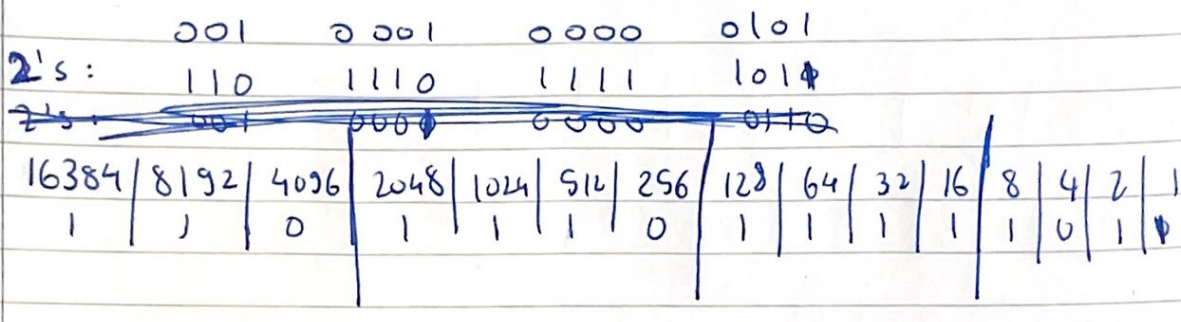
6) $0x9105 \rightarrow (?)_{10}$

Using the table I wrote out in #5,

9 → 1001
1 → 0001
0 → 0000
5 → 0101

-ve

1001 0001 0000 0101



$= 16,384 + 8,192 + 2048 + 1024 + 512 + 128 + 64 + 32 + 16 + 8 + 2 + 1$
$= +28,411$

Since the MSB is 1, it's $-28,411$

$0x9105 \rightarrow (-28,411)_{10}$

7) $0xD1A3 \rightarrow (?)_2$

D → 1101
1 → 0001
A → 1010
3 → 0011

1101 0001 1010 0011

$0xD1A3 \rightarrow (1101\ 0001\ 1010\ 0011)_2$

8) $0xA1F3 \longrightarrow (?)_{16}$

$0xA1F3 \longrightarrow (A1F3)_{16}$