

數字系統

十進位	二進位	八進位	十六進位
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

【數字系統間的轉換】

- ◆ 二、八、十六進位轉換成十進位：

$$(1111)_{10} = 1*1000+1*100+1*10+1*1$$

$$= 1*10^3+1*10^2+1*10^1+1*10^0$$

$$(1111)_2 = 1*2^3+1*2^2+1*2^1+1*2^0 = (\underline{\hspace{2cm}})_{10}$$

$$(1111)_8 = 1*8^3+1*8^2+1*8^1+1*8^0 = (\underline{\hspace{2cm}})_{10}$$

$$(1111)_{16} = 1*16^3+1*16^2+1*16^1+1*16^0 = (\underline{\hspace{2cm}})_{10}$$

- ◆ 十進位轉換成二、八、十六進位

$$(1234)_{10} = (\underline{\hspace{2cm}})_2$$

$$(1234)_{10} = (\underline{\hspace{2cm}})_8$$

$$(1234)_{10} = (\underline{\hspace{2cm}})_{16}$$

- ◆ 二、八、十六進位間的轉換

$$(10011010010)_2 = (010 \ 011 \ 010 \ 010)_2 = (\underline{\hspace{2cm}})_8$$

$$(10011010010)_2 = (0100 \ 1101 \ 0010)_2 = (\underline{\hspace{2cm}})_{16}$$

$$(1234)_8 = (\underline{\hspace{1cm}} \ \underline{\hspace{1cm}} \ \underline{\hspace{1cm}} \ \underline{\hspace{1cm}})_2 = (\underline{\hspace{2cm}})_2$$

$$(1234)_{16} = (\underline{\hspace{1cm}} \ \underline{\hspace{1cm}} \ \underline{\hspace{1cm}} \ \underline{\hspace{1cm}})_2 = (\underline{\hspace{2cm}})_2$$

練習一：十進位轉二進位

1. $(15)_{10} = (\quad)_2$	2. $(38)_{10} = (\quad)_2$
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練習二：二進位轉十進位

1. $(101101)_2 = (\quad)_{10}$	2. $(10001101)_2 = (\quad)_{10}$
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練習三：十進位與八進位互轉

1. $(1258)_{10} = (\quad)_8$	2. $(120)_8 = (\quad)_{10}$
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練習四：十進位與十六進位互轉

1. $(1258)_{10} = (\quad)_{16}$	2. $(1FF)_{16} = (\quad)_{10}$
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挑戰題： $(10110001)_2 = (\quad)_8 = (\quad)_{16}$