Binary to Decimal

Binary : 111001

Decimal : 57

Example

Find the decimal value of 111001_2:

binary number:	1	1	1	0	0	1
power of 2:	2^5	2^4	2^3	2^2	2^1	2^0

$$111001_2 = 1\cdot2^5+1\cdot2^4+1\cdot2^3+0\cdot2^2+0\cdot2^1+1\cdot2^0 = 57_{10}$$

Decimal to Binary

Decimal = 174

Binary = 10101110

Convert 174_{10} to binary:

Division by 2	Quotient	Remainder	Bit #
174/2	87	0	0
87/2	43	1	1
43/2	21	1	2
21/2	10	1	3
10/2	5	0	4
5/2	2	1	5
2/2	1	0	6
1/2	0	1	7

So $174_{10} = 10101110_2$

Octal to Decimal

Octal =37

Decimal = 31

37 in base 8 is equal to each digit multiplied with its corresponding 8^n:

$$37_8 = 3\times8^1+7\times8^0 = 24+7 = 31$$

Decimal to Octal

Decimal = 788

Octal = 1424

-8^x	quotient	Remainder
788 - 8^3	1	276
256 - 8^2	4	20
20 - 8^1	2	4
4 - 8^0	4	0

Binary to Octal

Binary = 110101011110

Octal = 6536

- Converting between binary and octal.
  - Since 8 is a power of 2, converting between binary and octal is straight forward.
  - binary to octal
    - from right to left group the binary digits in groups of 3.
    - convert each 3 digit binary grouping into an octal number.

1	1	0	1	0	1	0	1	1	1	1	0

4 + 2 + 0 | 4 + 0 + 1 | 0 + 2 + 1 | 4 + 2 + 0

110101011110
2
110 101 011 110
2

6536_8

Octal to Binary

Octal = 5271

Binary = 101010111001

- octal to binary
  - convert each octal digit into a binary number

5271_8

101 010 111 001
2

101010111001_2

remember to have in groups of 4

Hex to Decimal

Hex = E7A9

Decimal = 59305

E7A9 in base 16 is equal to each digit multiplied with its corresponding 16^n:

$$E7A9_{16} = 14\times16^3+7\times16^2+10\times16^1+9\times16^0 =$$

$$57344+1792+160+9 = 59305_{10}$$

Decimal to Hex

Decimal = 35631

Hex = 8B2F

10	A
11	B
12	C
13	D
14	E
15	F

Division by 16	Quotient	Remainder (decimal)	Remainder (hex)	Digit #
35631/16	2226	15	F	0
2226/16	139	2	2	1
139/16	8	11	B	2
8/16	0	8	8	3

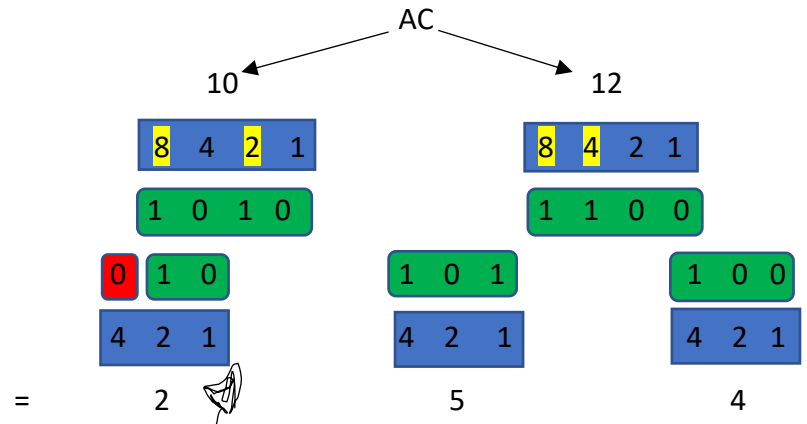
Hex to Octal

Hex = AC

Octal = 254

Binary

sets of 3



Octal to Hex

Opposite of that yoke, cant be arsed doing that again