

Bases

1 of 2

- Decimal Numbers (Base 10) - has digits 0 through 9

$$789 = 7 \cdot 10^2 + 8 \cdot 10^1 + 9 \cdot 10^0$$



- Binary Numbers (Base 2) - has digits 0 & 1

$$0b_{1100101} = 1 \cdot 2^6 + 1 \cdot 2^5 + 0 \cdot 2^4 + 0 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0 = 101$$

prefix "0b"
means binary

0	0
1	1
10	2
11	3
100	4
101	5
⋮	⋮

- Octal Numbers (Base 8) - has digits 0 through 7

$$0572 = 5 \cdot 8^2 + 7 \cdot 8^1 + 2 \cdot 8^0 = 378$$

prefix "0"
means octal

0	1	2	3	4	5	6	7	10	11	...
0	1	2	3	4	5	6	7	8	9	...

● Hexadecimal Numbers (Base 16) -

has digits 0, 1, 2, ..., 9, a, b, c, d, e, f

$$0x9da = 9 \cdot 16^2 + d \cdot 16^1 + a \cdot 16^0 = 9 \cdot 16^2 + 13 \cdot 16^1 + 10 \cdot 16^0 = 2522$$

prefix "0x"
means hexadecimal

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	10	11	...
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	...