

Unit 1

- Binary Numbers
- Hexadecimal Numbers



Binary Number System

A number system that only has 2 possible digits, 0 and 1.



Binary to Decimal Conversion

- Each binary position is weighted as a power of 2
- Sum the value of each weighted position to calculate the decimal equivalent.
- Example: 1 1 0 1 1 0 1 in binary

$$(1)*2^6+(1)*2^5+(0)*2^4+(1)*2^3+(1)*2^2+(0)*2^1+1*2^0$$

$$64+32+0+8+4+0+1 = 109$$



More Examples:

1. What is the decimal equivalent of 100011 (binary)?
2. What is the decimal equivalent of 1010101 (binary)?
3. What is the binary equivalent of 5925 (decimal)?



Hexadecimal Number System

A number system that has 16 possible digits.

Decimal	Hex		Decimal	Hex
0	0		8	8
1	1		9	9
2	2		10	A
3	3		11	B
4	4		12	C
5	5		13	D
6	6		14	E
7	7		15	F



Hexadecimal to Decimal Conversion

- Each hexadecimal position is weighted as a power of 16
- Sum the value of each weighted position to calculate the decimal equivalent.
- Example: A045 in hex is equal to:

$$(10)*16^3 + (0)*16^2 + (4)*16^1 + 5*16^0$$

$$40960 + 0 + 64 + 5 = 41029$$



More Examples:

1. What is the decimal equivalent of C5F2 (hexadecimal)?
2. What is the hexadecimal equivalent of 10101101 (binary)?
3. What is the hexadecimal equivalent of 20391 (decimal)?

