

# Representation of numbers: Decimal system

- Decimal number system is a base-10 system.
- The digits are 0,1,2,3,4,5,6,7,8,9
- For example, 957 is  
$$957 = 9 * 10^2 + 5 * 10^1 + 7$$

# Representation of numbers: Binary system


- Binary number system is a base-2 system.
- The digits are 0, 1
- A digit is called 'bit'
- Example, 1110 is a binary number.
- Its value is
$$1 * 2^3 + 1 * 2^2 + 1 * 2^1 + 0$$
$$= 13 \text{ in decimal}$$
- Collection of 8 bits is called a 'byte'  
Example: 11010100

# Representation of numbers: Hexadecimal system

- Hexadecimal number system is a base-16 system.
- The digits are 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F
- Example, A3B is a Hex number.

- Its value is

$$\begin{aligned} & A * 16^2 + 3 * 16^1 + B \\ &= 10 * 16^2 + 3 * 16^1 + 11 \\ &= 2114 \text{ in decimal} \end{aligned}$$

- A byte consists of two Hex digits
- Example: Let the byte be 11010100  

- Hex equivalent is D4