Pre Requisites:

- Basic Java

List of concepts involved :

- Number System
- Conversion of Number System
- Bits Manipulation

Number System

A number system is defined as the representation of numbers by consistently using digits or other symbols. The value of any digit in a number can be determined by a digit, its position in the number, and the base of the number system. The numbers are represented in a unique manner and allow us to operate arithmetic operations like addition, subtraction, and division.

There are different types of number systems in which the four main types are as follows.

- **Binary number system (Base - 2)**
- **Octal number system (Base - 8)**
- **Decimal number system (Base - 10)**
- **Hexadecimal number system (Base - 16)**

Binary Number System
The binary number system uses only two digits 0 and 1. The numbers in this system are base 2. The numbers 0 and 1 are called bits, and together 8 bits make up a byte. Computer data is stored in the form of bits and bytes. The binary number system does not work with other numbers like 2,3,4,5 etc.

Example: (10001)base 2, (111101)base , (1010101)base 2 are some examples of numbers in the binary system.

Octal Number System
The octal number system uses 8 digits: 0,1,2,3,4,5,6 and 7 are the base 8. The advantage of this system is that it requires fewer calculations as it has fewer digits compared to other systems. error. Numbers such as 8 and 9 are not included in the octal number system. Like binary, octal is used on minicomputers, but uses the numbers 0 through 7.

Example: (35)base 8, (23)base 8, (141)base 8 are some examples of octal numbers.

Decimal Number System
The decimal number system uses 10 digits: 0,1,2,3,4,5,6,7,8 and 9 and the base digit 10. The decimal number system is the number we usually use to represent numbers in real life. It's a system. . If you see a number with no base, it means the base is 10.

Example: (723)base 10, (32)base 10, (4257)base 10 are some examples of numbers in the decimal number system.