

Students, this lesson is of class VII, for the subject of Computers. Topic is 'Number System', which is covered in Chapter 2 starting on page no. 20 of your text book titled 'Logix 7' and is being submitted to you on 29.04.2024. Now students what is a number? A number is a mathematical object used to count, measure and label. Numbers can be represented in language with number words. More universally, individual numbers can be represented by symbols called numerals, for example "5" is a numeral that represents the number five.

In the earlier times when there were no means of counting, people used to count with the help of fingers, stones, pebbles, sticks etc. These methods of counting were not sufficient and had many limitations. So to overcome these limitations many number systems were introduced with the passage of time, like:

1. Decimal Number System
2. Octal Number System
3. Binary Number System
4. Hexadecimal Number System

Students, in our day to day life we humans use decimal number system. The dictionary meaning of decimal number system is 'The system of numbers that counts in tens or tenths'. whereas a computer represents

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all kinds of data and information in binary number system. It is also known as the system of numbers that uses only 0 and 1.

Introduction to Decimal Number System:

Decimal number system consists of ten digits that are 0 to 9 with the base 10. The total number of digits used in a number system is called its Base. In decimal number system each number can be used individually or they can be grouped to form a numeric value, for example 82, 46, 38 etc.

So children, the value of each digit in a number depends upon the following:

1. The face value of the digit.
2. The base of the number system.
3. The position of the digit in the number.

Let us consider an example, the number 681 can be represented in the following way:

681 (Here number 1 is at units place)
 number 8 is at tens place)
 and number 6 is at hundreds place)

The positional value of each digit increases ten folds as we move from right to left. The right most digit of a number is called least significant digit whereas the left most digit is called Most Significant Digit. In the above given example of number 681, number 1 is least significant

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which means it is the lowest digit in the number whereas number 6 is the most significant which means the number with greatest value.

Before starting let me introduce you with binary numbers. The word binary comes from 'Bi' meaning two. A number system where a number is represented by using only two digits 0 (zero) and 1 (one) with a base 2 is called a binary number system.

Now question is why we need or require binary numbers when we have decimal numbers. This is because a computer cannot understand human language, rather it understands only the binary code, that is formed or created using binary numbers. Therefore, the data that is entered into a computer is converted into its binary format. Computers use the binary number system to manipulate and store all of their data including numbers, words, video graphics and music.

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So, first we must know, how we write binary numbers as we are having only two numbers that are 0 and 1.

In binary number system any number can be formed only by using 1's and 0's. For example digit 2 of decimal number is equivalent to 0010 of binary number.

Students let us now start with conversion of decimal into binary number system. To convert a decimal number into a binary number follow the given rules one by one.

1. Divide the given decimal number with 2, as 2 is the base value of binary number.
2. Write down the remainder and divide the quotient again by 2.
3. Repeat the step 2 till the quotient is zero.
4. Write the remainders obtained in each step in the reverse order to form the binary number.

Let us take an example \therefore Decimal no. 10.

		Remainder
2	10	0
2	5	1
2	2	0
2	1	1
	0	

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Students now start writing the remainders in the reverse order starting from left to right 1010. So our decimal number 10 is equivalent to binary number 1010.

Now try one another number. Convert 26 decimal number into binary number

		Remainder
2	26	0
2	13	1
2	6	0
2	3	1
2	1	1
	0	

Start writing the remainder from the bottom to top in left to right direction. So answer for conversion of decimal number 26 into binary number is 11010

Students, as you know Aryabhat was India's greatest Mathematician and astronomer. He introduced the concept of zero. Without zero modern computer technology would have been non-existent. As the Binary number system is the

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Only code that a computer understands. And binary codes are formed only by using 0's and 1's. Therefore the data that is entered into a computer is converted into its binary equivalent. It further converts the binary result into its decimal number to generate an output.

So, children I am ending the topic here. All of you are directed to read the lesson carefully and practice the conversion of decimal number to Binary number.