

PORTFOLIO #3

NUMBER SYSTEMS

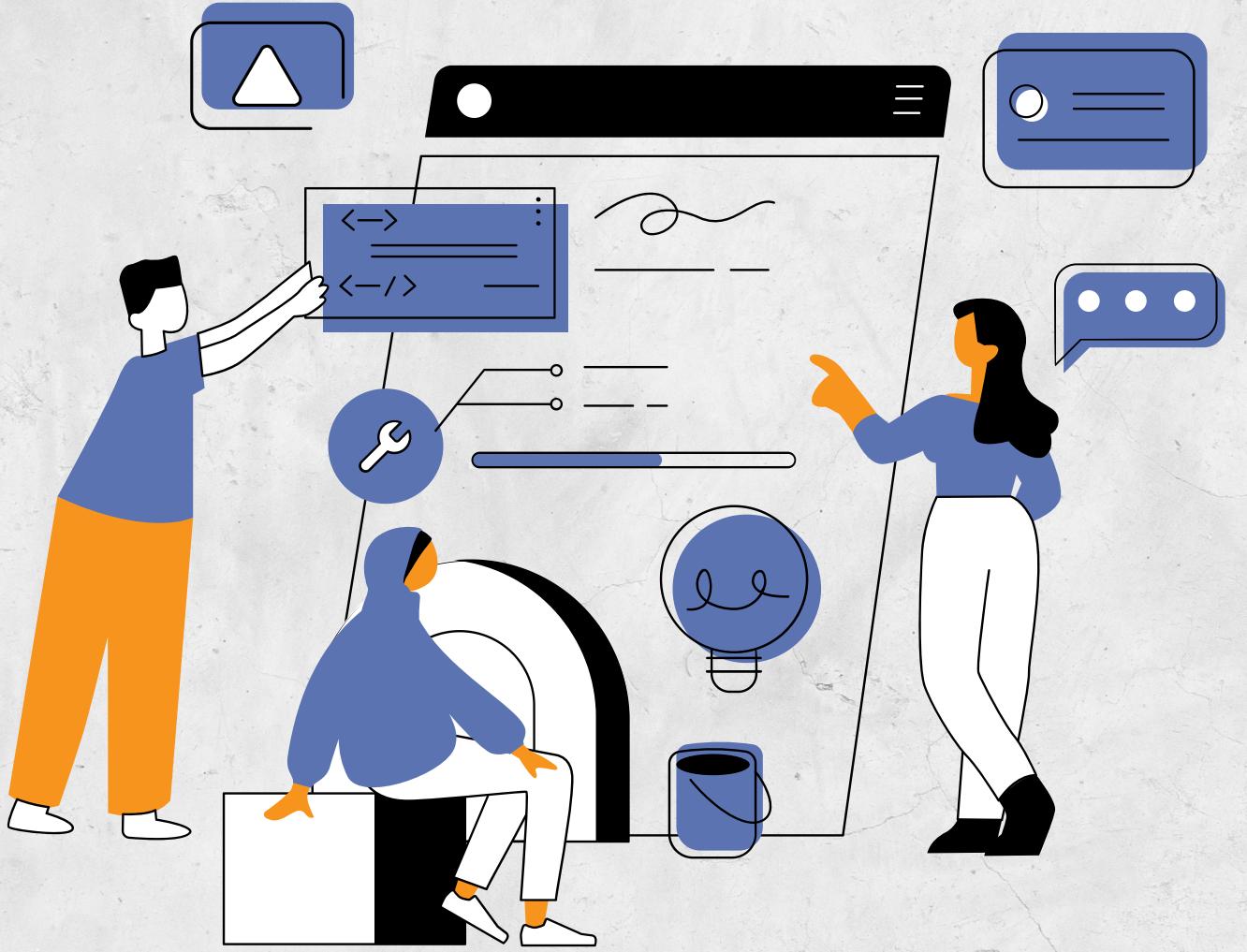


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What are Number Systems?

History:

- This system was established by the 7th century in India, but was not yet in its modern form because the use of the digit zero had not yet been widely accepted.
- By the 13th century, Western Arabic numerals were accepted in European mathematical circles (Fibonacci used them in his Liber Abaci).





What are Number Systems?

- representation of numbers by using digits or other symbols in a consistent manner.
- 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.





Types of Number Systems:

1. Binary number system (Base - 2)
2. Octal number system (Base - 8)
3. Decimal number system (Base - 10)
4. Hexadecimal number system (Base - 16)



Types of Number Systems:

1. Binary number system

- A Binary Number is made up of only 0s and 1
- Digits 0 and 1 are called bits and 8 bits together make a byte.

2. Octal Number System

- a number system with base 8 as it uses eight symbols (or digits)
- This number system is mainly used in computer programming as it is a compact way of representing binary numbers with each octal number corresponding to three binary digits.



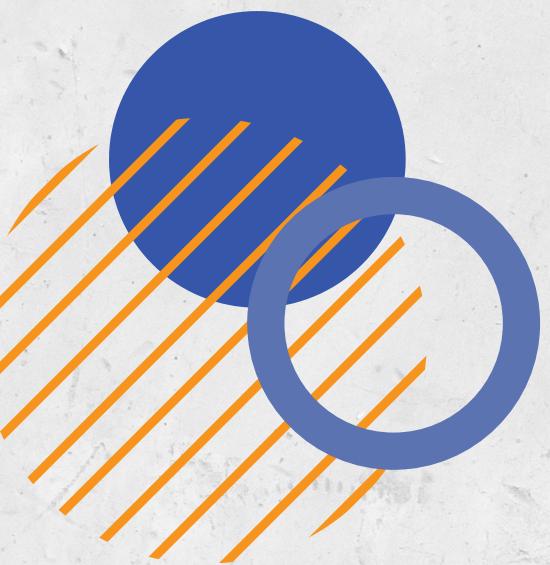
Types of Number Systems:

1. Decimal Number System

- in mathematics, positional numeral system employing 10 as the base
- requiring 10 different numerals, the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

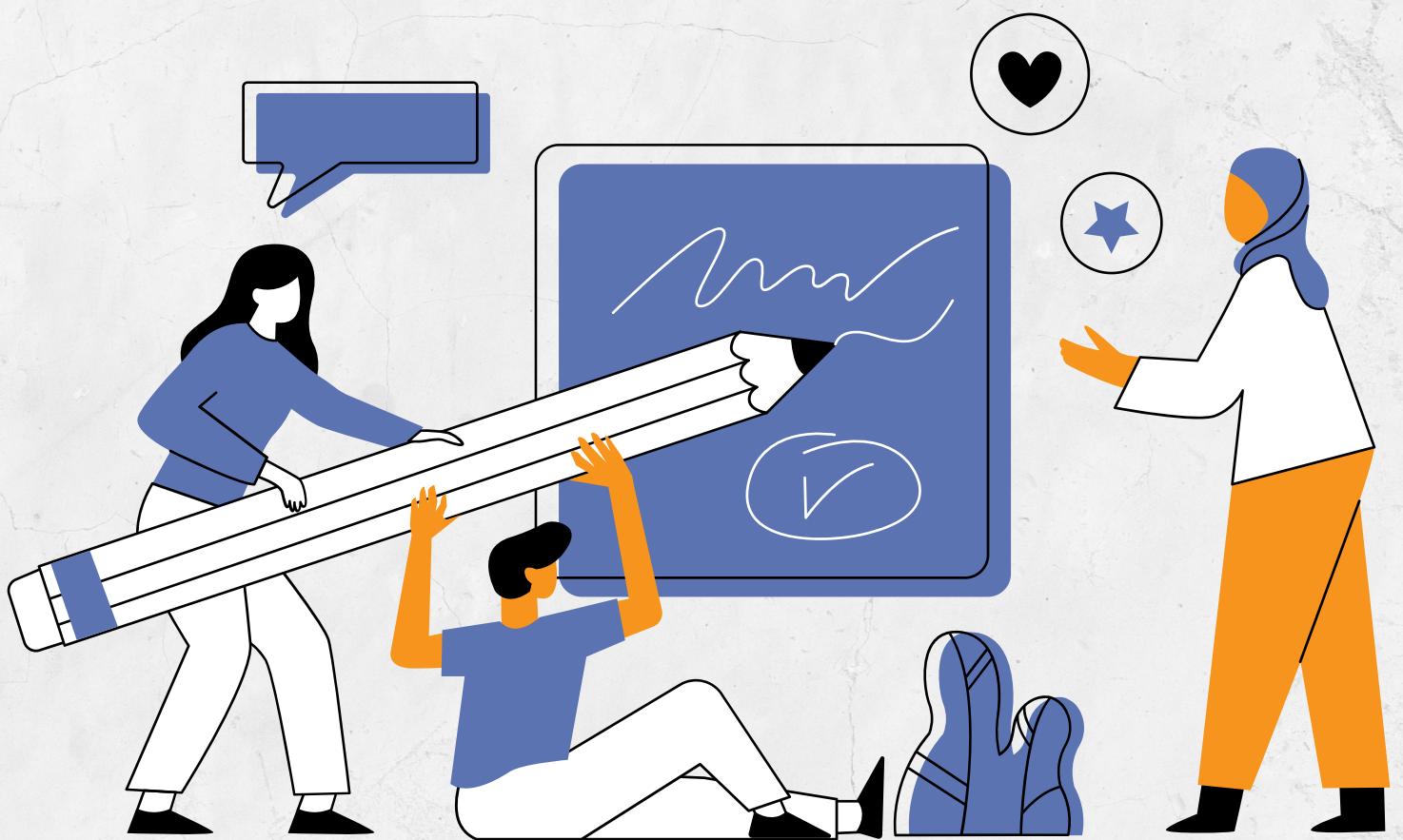
2. Hexadecimal Number System

- a number system with base 8 as it uses eight symbols (or digits)
- This number system is mainly used in computer programming as it is a compact way of representing binary numbers with each octal number corresponding to three binary digits.



What are the uses/significance of each number system?

- represents the specific identity that a number possesses on the number line and provides it with a significant notation.
- All the Mathematical concepts and formulas are based on Number system.
- a way of representing numbers on the number line with the help of a set of Symbols and rules.
- The number system can be defined as the system which uses particular words or symbols for quantifying a given object or value.



Reflection:

Number systems are really crucial nowadays because the role of technology in our society is steadily growing. Fundamental to computers and other digital devices is the binary number system (base 2), employing only two digits: 0 and 1. Binary is important in comprehending the operating of computers and how they store and manipulate data. Even the simplest addition or subtraction as well as the most complicated calculations are based on this type of system.

Other systems like hexadecimal system base 16 and octal system base 8 are also important since they assist in transforming binary data. Hexadecimal is used a lot in programming because it is much easier to read long strings of numbers that are actually binary numbers. For example, addresses of the computer memory are in some cases represented in base-16 to simplify management of such addresses. The same is true for the octal system which also aids in certain tasks by grouping the binary digits into subsets, thus making the work less tedious.

Reflection:

However, we still employ base 10 numeration system in our day to day activities such as shopping, counting and simple arithmetic operations. Everyone can easily follow it and its usage is common in industries requiring accurate measurement, for instance, finance and engineering. Therefore, the decimal system also serves as a converter between the numbers people use and the binary numbers adopted by computers.

Since the usage of technology in jobs is increasingly common and since we use more digital, understanding the number system is increasingly useful. It is not only useful for the computer scientists or engineers, for anyone who can have a simple understanding of such systems can have better communication and interaction skills with the machines, problem solving and even have a positive growth in areas which the computations are important. It is important to be aware of how these systems work in today's fast paced, continually evolving technological world.

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