Numbers

What are numbers

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 modern mathematics, we can divide numbers into many groups. For example, numbers can be **classified** into sets, called number systems, such as the natural numbers and the real numbers. The major **categories** of numbers are natural, integer, rational, real and complex numbers.

Importance of numbers

Numbers play an **important role** in our lives. Almost all the things we do involve numbers and Mathematics. Numbers, math in general, are crucial to **decoding objective reality**, or otherwise said, finding consistent patterns in the objective world through measurements and observation. Also, numbers and math are a part of **probability and logic** which is the objective lens the world should be seen through. Or otherwise said, crucial components of the objective toolkit that is available to us.

Usage of mathematical terminology

As a complicated field, there are various types of math in computer science. Computer science examines the principles and use of computers in processing information, designing hardware and software, and using applications. Possessing a strong foundational knowledge of mathematics is vital to gaining an understanding of how computers work. Mathematics is a fundamental scholarly tool in computing.

Mathematical expressions important in informatics

1. An **axiom** is a basic true information, which does not need to be proved. In the IT sphere, an axiom can help us describe a fundamental relationship between two objects.
2. **Natural numbers** are a set of integers, including positive integers, zero and negative integers. They are used when incrementing or decrementing values, for example in *for* loops.
3. **Variables** are used in every programming language, we can set all different kinds of variables, for example integer or string.
4. **Recursive formula** or in IT its called recursive function, is a function that calls itself with different arguments of the function.
5. **NULL set,** often used by programmers to set a pointer on empty space in memory before it is used.
6. **Negation** represents the opposite of a statement and can be used in building a logical circuit.
7. **Prime numbers** are numbers that can be divided only by 1 or by itself and are used in encryption methods. They are used to encrypt passwords and other secret information, mostly in online communications and special key encryptions. New prime numbers are discovered every few years, as it is a very tough process of calculation. It may take even a few days on the fastest computers in the world to

    calculate a larger prime number. One of the methods used for calculating prime numbers is called **the sieve of Eratosthenes.**

8. Computers work only with true/false values (**truth values**), which represent whether or not electric current flows.

9. **Addition** very basic operation, where values of 2 numbers are combined, taught in elementary schools and performed on all computers in the world.

10. In programming, the name **"vector"** was originally used to describe any fixed-length sequence of scalar numbers. A vector of length 2 represents a point in a 2D plane, a vector of length 3 represents a point in a 3D space, and so on. In mathematics, a vector can be thought of as a combination of **direction** and **magnitude**.

11. An **ordered pair** is a composition of the x coordinate (**abscissa**) and the y coordinate (**ordinate**), having two values written in a fixed order within parentheses. It helps to locate a point on the Cartesian plane for better visual comprehension.