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PORTFOLIO

#3



TABLE OF CONTENTS

What is a
number
system?

Types of
number
system

Significance
of each
number
system

WHAT ARE NUMBER SYSTEMS?

a system of writing to express numerical values, it is a mathematical notation used to represent used to a set by using digits and symbols to represent the given values



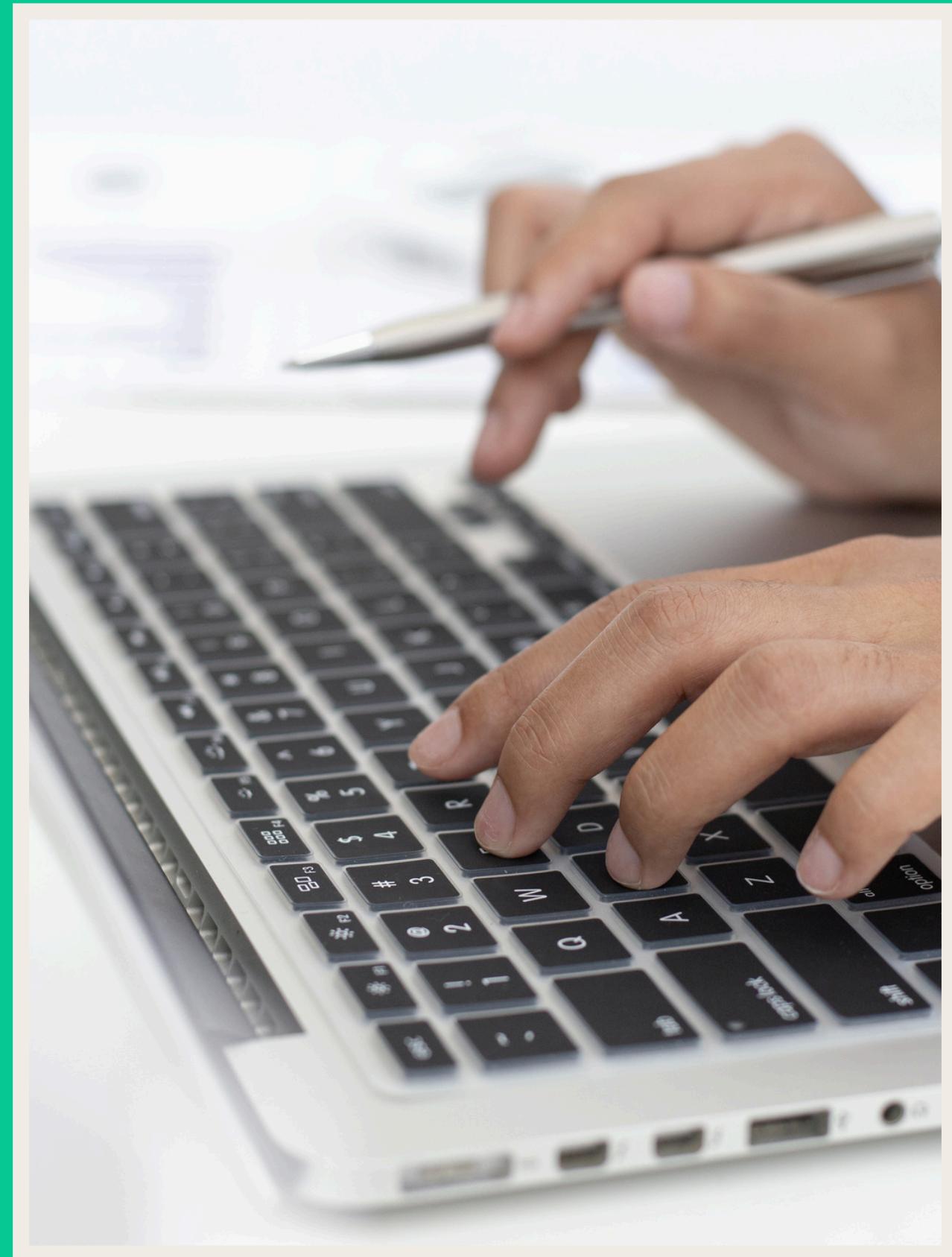
NUMBER SYSTEMS HAVE

- Natural Numbers A set of numbers as is used to count certain objects are called natural numbers. Such a set of numbers starts with 1(one) and goes on till infinity. It is to be noted that natural numbers include only positive integers.
- Whole Numbers A set of numbers that includes all the positive integers and zero.
- Integers An integer is defined as such a whole number that can assume either positive, negative or no value at all.
- Real Numbers Such numbers which include both rational numbers and their irrational counterparts.
- Rational Numbers Such numbers can be expressed in the form of a fraction.
- Irrational Numbers Such numbers cannot be expressed as a fraction.



TYPES OF NUMBER SYSTEMS

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





IMPORTANCE OF EACH NUMBER SYSTEM

Each number represents specific identities that a number posses in which provides a significant notation in each given line. It gives the arithmetic structure of a number that helps us calculate the specific number we needed.

NUMBER SYSTEM: DECIMAL

The decimal number system has a base of 10 because it uses ten digits from 0 to 9. In the decimal number system, the positions successive to the left of the decimal point represent units, tens, hundreds, thousands and so on

used for buying groceries, trading stocks, tracking football scores or scrolling through cable channels.

EXAMPLE:

$$(5 \times 10^2) + (4 \times 10^1) + (8 \times 10^0)$$

$$= 5 \times 100 + 4 \times 10 + 8 \times 1$$

$$= 500 + 40 + 8$$

$$= 548$$

Decimal	Binary
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010
11	1011
12	1100
13	1101
14	1110
15	1111

NUMBER SYSTEM: BINARY

The base 2 number system is also known as the Binary number system wherein, only two binary digits exist, i.e., 0 and

1. Specifically, the usual base-2 is a radix of 2. The figures described under this system are known as binary numbers which are the combination of 0 and 1

It is most commonly used today in electrical engineering and computer science, and is incredibly effective at reducing errors in data storage and transmission

EXAMPLE:

- 50 can be written as 110010

Decimal	Binary
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010
11	1011
12	1100
13	1101
14	1110
15	1111

NUMBER SYSTEM: OCTAL

the base is 8 and it uses numbers from 0 to 7 to represent numbers.

Octal numbers are commonly used in computer applications.

Used in computer application sectors and digital numbering systems,
the computing systems use 16-bit, 32-bit or 64-bit word which is further
divided into 8-bits words.

EXAMPLE:

- $(112)_{10}$ can be expressed as $(287)_8$.

OCTAL	BINARY
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

NUMBER SYSTEM: HEXADECIMAL

In the hexadecimal system, numbers are written or represented with base 16. In the hexadecimal system, the numbers are first represented just like in the decimal system, i.e. from 0 to 9. Then, the numbers are represented using the alphabet from A to F

Used to write large binary numbers in just a few digits. It makes life easier as it allows grouping of binary numbers which makes it easier to read, write and understand

Hexadecimal to Decimal Table

Hexadecimal (Base 16)	Decimal (Base 10)	Binary (Base 2)
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
A	10	1010
B	11	1011
C	12	1100
D	13	1101
E	14	1110
F	15	1111

REFLECTION

Numbers are essential to many scientific and technical developments, as well as in our daily life. These numbers provide a methodological framework for measuring, analyzing and understanding the environment in which we live. Different types of numbers. Each type has different properties. It has specialized functions and allows for a wide variety of mathematical operations... The simplest type of numbers, called natural numbers, are used to count and arrange objects. They start with number one and go on forever. Adding zeros causes integers to expand the range of natural numbers. This makes it possible to represent voids or absences. Profit, Loss Profit and loss should be expressed using integers. Which is an integer that can be both positive and negative. Rational numbers are expressed in different ways, they are extremely valuable for accurate measurements and calculations. Number systems are widely used in fields such as engineering, science, and finance. Irrational numbers have unique decimal expansions. It is important for certain math and science concepts. Examples of these can be the square root of 2 and pi.

Real numbers, including rational and irrational numbers. It is a comprehensive system for representing any point on a number line. It is the basis of various mathematical operations. and is widely used in calculus, geometry, and other fields of mathematics. The importance of understanding different types of numbers. There's more to it than just mathematical calculations. These are essential for understanding scientific concepts. data analysis and making informed decisions in various areas, for example in economics. Understanding rational numbers is important for financial analysis and investment decisions. In terms of physics, irrational numbers such as pi are the foundations for calculating circles and trigonometry.

In conclusion, numbers in different kinds become a tool for human comprehension. They provide the means of understanding measurement and analyzing the world around us. When understanding these different types of numbers and by applying them, we are able to see the importance of these numbers in our daily life and in various endeavors of the technological world.

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