



# **PORTFOLIO #3**

## Presentation

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# CONTENT

- **What are Number Systems?**
- **Types of Number Systems**
- **What are the uses/significance of each number system**
- **My Analysis/Reaction**

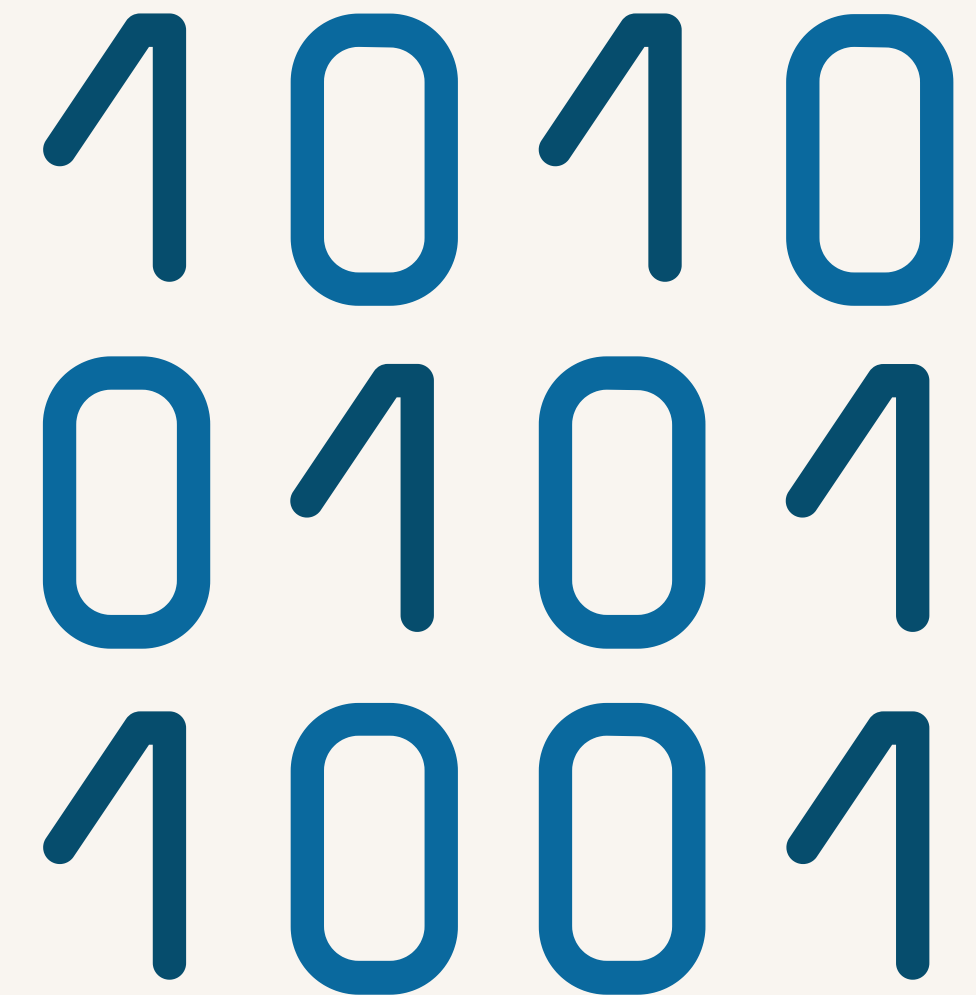


# WHAT ARE NUMBER SYSTEMS?

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From what i have read from my research on the internet from peer reviewed materials, these are the the key points and information that i have analyzed from the following materials:

- A number system is a set of rules and symbols used to represent a number
- Any system used for naming or representing numbers is called a number system and it is also known as “numeral system”.
- It is a mathematical notation used to represent numbers from a given set through the use of digits or other symbols in a consistent manner.
- It offers a distinct representation for each number and reflects the arithmetic and algebraic structure of the values.
- There are 4 commonly used types of number systems namely the Decimal Number System, the Binary Number System, the Octal Number System, and the Hexadecimal Number System



1 0 1 0  
0 1 0 1  
1 0 0 1



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# TYPES OF NUMBER SYSTEMS

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## Decimal Number System

The decimal number system, also known as the international system of numbers, is sometimes referred to as the base-ten or denary system. With ten as its base, it is the most commonly used numerical system in modern society. The decimal number system has a base of 10 because it uses ten digits from 0 to 9.

8

## Octal Number System

The octal number system, as its name suggests, it is the number system with the base 8. It uses eight symbols, 0, 1, 2, 3, 4, 5, 6, and 7 to represent numbers. Therefore, in the octal system, digits can only range from 0 to 7. Like the decimal and binary systems, it is also a positional number system.



## Binary Number System

The binary number system, or base-2 system, uses only two symbols, 0 and 1. Known as bits, these symbols represent numbers in a positional system, where each position has a specific weight. For example, 110101 is a binary number. Also binary arithmetic is much simpler than decimal arithmetic because here only two digits, 0 and 1 are involved.

16

## Hexadecimal Number System

The hexadecimal number system is widely used in computing due to its efficiency. It is a base-16 system, which means it uses 16 distinct symbols to represent values. These symbols include the digits 0 through 9 and the letters A through F. The hexadecimal system combines both numerical and alphabetical characters to form its digits. For example, a number in a hexadecimal system can be written as B46 or D54.



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# WHAT ARE THE USES/SIGNIFICANCE OF EACH NUMBER SYSTEM

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## Decimal Number System

The decimal number system is the most familiar and widely used number system, particularly in everyday life and general calculations. It's applied in financial transactions, measurements, and most real-world applications due to its straightforwardness in representing quantities and performing arithmetic operations.

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## Octal Number System

The octal number system is used less frequently today but played an important role in early computing systems. It is still used in some embedded systems and older computer architectures. Since octal represents three binary digits per octal digit, it was often used as a shorthand for binary in earlier systems to make binary codes more readable by humans.



## Binary Number System

Binary is the fundamental language of computers. It uses only two symbols, 0 and 1, which correspond to off and on states in digital circuits. Every modern digital device, including computers, smartphones, and network systems, processes data in binary. Its simplicity allows for reliable data storage and transmission in digital systems, where complex tasks are broken down into binary operation.

16

## Hexadecimal Number System

The hexadecimal number system is commonly used in computing and digital electronics today. It is commonly used because it provides a more compact way to represent binary data. Each hexadecimal digit represents four binary digits, making it easier to read and write large binary numbers. It is widely used in programming, particularly in memory addresses, color codes in web development, and assembly level programming.



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# My Analysis/Reaction

First of all i think that i have learned a lot about the concept of number systems and its different types, especially the most used ones like the decimal, binary, octal, and hexadecimal number system. It also made me learn that these number systems are currently being used on the things we use in our everyday lives like our computers, electronic devices and etc. I have learned that a number system is a way to represent numbers using specific symbols and rules, with four main types namely, Decimal, Binary, Octal, and Hexadecimal. The Decimal system is the most common and is used in everyday life, with ten digits from zero to nine, making it ideal for things like money, measurements, and basic math. The Binary system uses only two digits, zero and one, and is the fundamental language of computers. For example, the binary number 110101 represents information using just these two digits, which is how computers process data through on and off states. The Octal system uses eight digits, from zero to seven, and was popular in early computers because it could represent three binary digits with one octal digit, making binary numbers easier to read. Though it's used less today, it's still applied in some older systems. Finally, the Hexadecimal system uses sixteen symbols, including the digits zero to nine and the letters A to F. It is widely used in computing because it efficiently represents large binary numbers. For instance, the hexadecimal number B46 can be easily converted to binary, making it useful for programmers when dealing with memory addresses, color codes in web development, or assembly-level coding. These different number systems are crucial in different fields, especially in technology, helping simplify the way data is represented, processed, and stored.