



# NUMBER SYSTEMS: TYPES AND SIGNIFICANCES

DIFFERENT TYPES AND ITS SIGNIFICANCES

CIS 1102N PORTFOLIO #3

# NUMBER SYSTEMS...

**N**umber systems are mathematical notations used to represent and express numbers. They provide a consistent method for writing numbers using digits or symbols.

# NUMBER SYSTEMS...

Each digit's value is determined by its position within the number and the base of the system being used. This structure allows for unique representations of numbers and facilitates arithmetic operations such as addition, subtraction, multiplication, and division

# TYPES OF NUMBER SYSTEMS:

01. Binary (Base - 2)

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02. Octal (Base - 8)

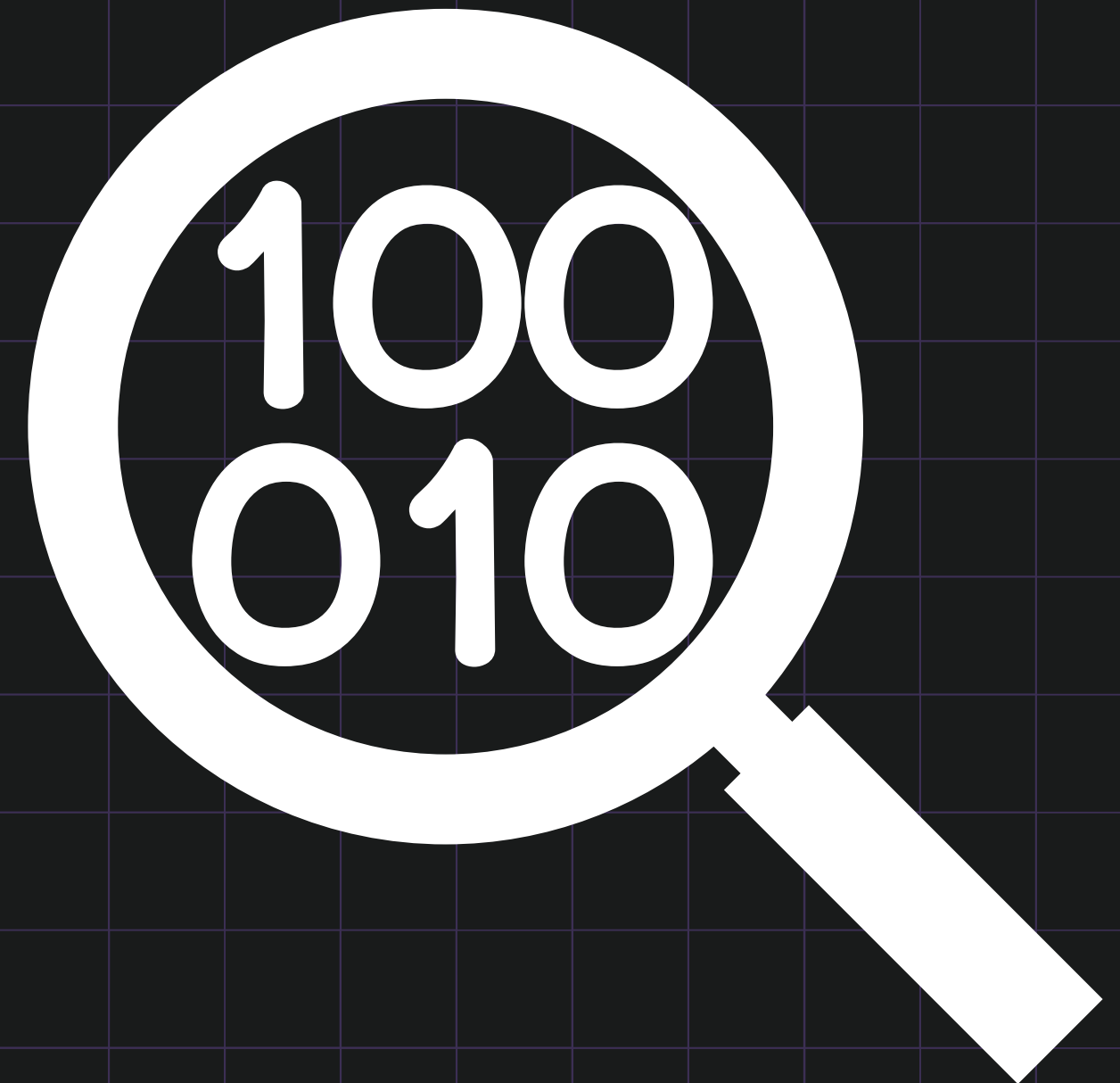
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03. Decimal (Base - 10)

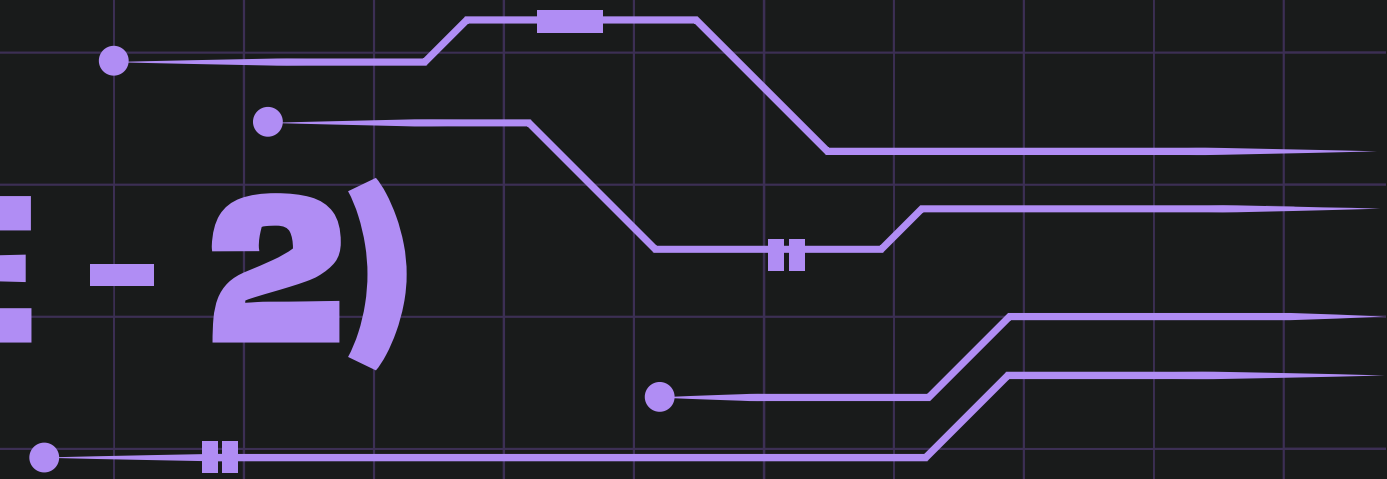
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04. Hexadecimal (Base - 16)

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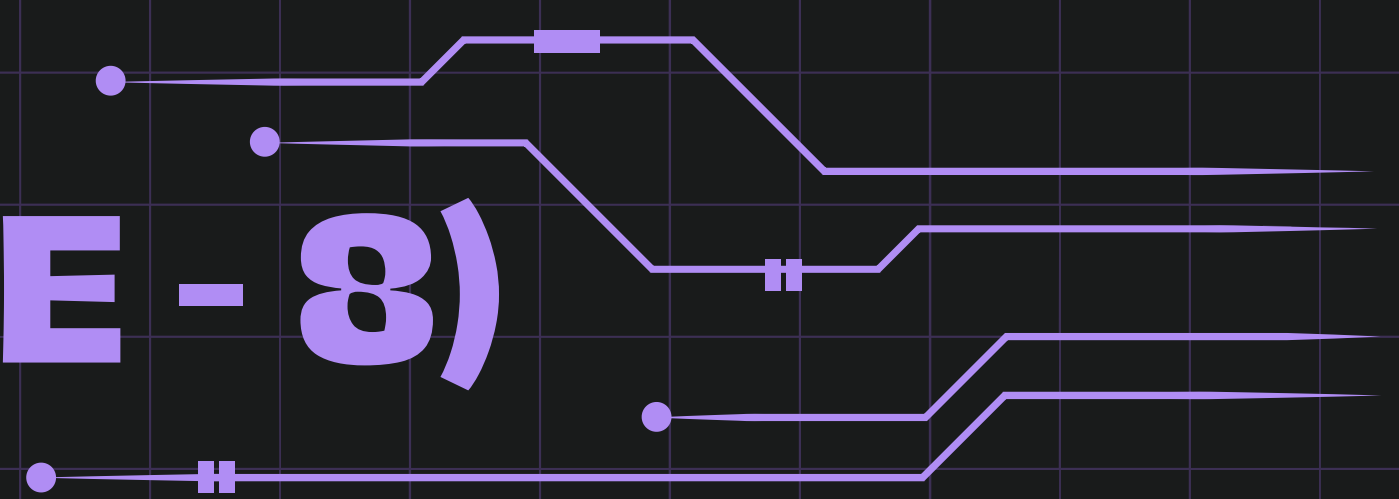
# BINARY (BASE - 2)



- Uses only two digits: 0 and 1.
- Essential for computer systems, where it represents the two states of electronic circuits (on and off).



# OCTAL (BASE - 8)



- Often used in computing as a compact notation for binary numbers, it uses eight digits (0-7)
- It's essential for representing data in computers and digital devices.



# DECIMAL (BASE - 10)

A decorative graphic in the top right corner consisting of several horizontal and diagonal lines in a light blue color, resembling a circuit board or a stylized signal path. Some lines have small circular nodes at their endpoints.

- Utilizes digits from 0 to 9.
- Each digit's value is based on its position, which corresponds to powers of 10.



# HEXADECIMAL (BASE - 16)



- Includes digits from 0 to 9 and letters A to F (where A=10, B=11, C=12, D=13, E=14, F=15).
- Commonly used in programming and computer science for its compactness in representing binary data





# USES/SIGNIFICANCE OF EACH NUMBER SYSTEM



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# **BINARY NUMBER SYSTEM (BASE-2)**

- Data Representation: The binary system is fundamental in computing, as all data, numbers, text, images, and sounds are represented in binary format (0s and 1s). This is crucial for digital devices, which operate using electronic switches that represent these two states.
- Binary is employed in data transmission over networks, where information is encoded and decoded into binary form for efficient transfer and processing.

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## **OCTAL NUMBER SYSTEM (BASE-8)**

- The octal system uses fewer digits (0-7), making it less prone to errors in certain computational contexts. It serves as a shorthand for binary, where each octal digit corresponds to three binary digits.
- While less common today, octal was historically used in some computing systems and programming languages, particularly in early computer architecture.

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# DECIMAL NUMBER SYSTEM (BASE-10)

- The decimal system is the most widely used number system in daily life, making it essential for general counting, commerce, and education. It is intuitive for humans, as it aligns with our natural counting methods.
- Decimal is used in most mathematical calculations and is the default system for representing numbers in most contexts outside of computing.

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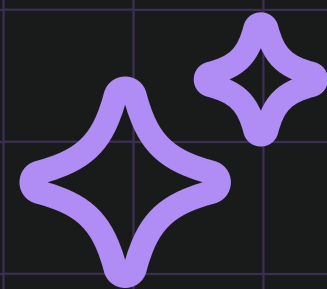
# HEXADECIMAL NUMBER SYSTEM (BASE-16)

- Hexadecimal is used in computing to represent binary data more compactly. Each hex digit can represent four binary digits, making it easier to read and write large binary numbers.
- It is commonly used in programming for memory addresses and in web design for color codes (e.g., HTML and CSS), allowing for a more manageable representation of complex data.

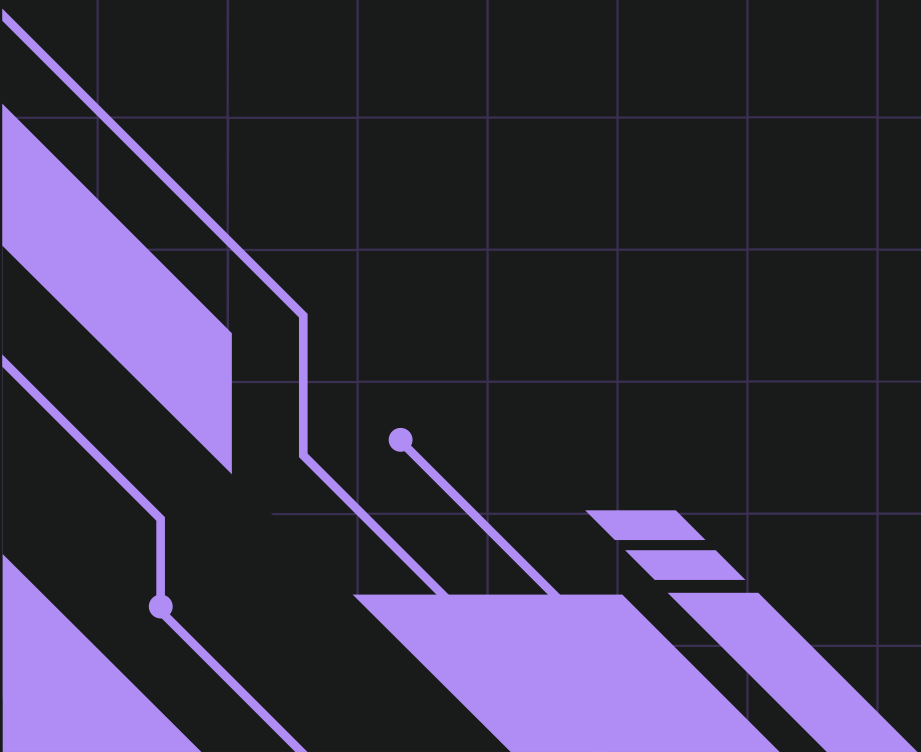
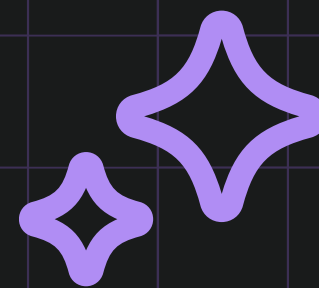
# MY SUMMARY...

My own understanding is that binary number system is like the backbone of all computing systems. It uses only two digits 0 and 1 to represent all kinds of data, which makes it efficient for computers to process and store information. Where circuits can easily be in an "on" (1) or "off" (0) state. However, while binary is essential, the other number systems octal, decimal, and hexadecimal also have their unique advantages.

Each number system has its significance, contributing to efficiency in computing and beyond. Knowing how these systems work and their applications allows us to improve our skills and understanding of technology and mathematics, leading to better problem-solving and innovation in our own respective fields. These number systems are not just a theoretical exercise; they're essential for practical applications in various fields such as computer science, mathematics, and engineering.



# THANK YOU!







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