Digital Logic Design (EC 212)

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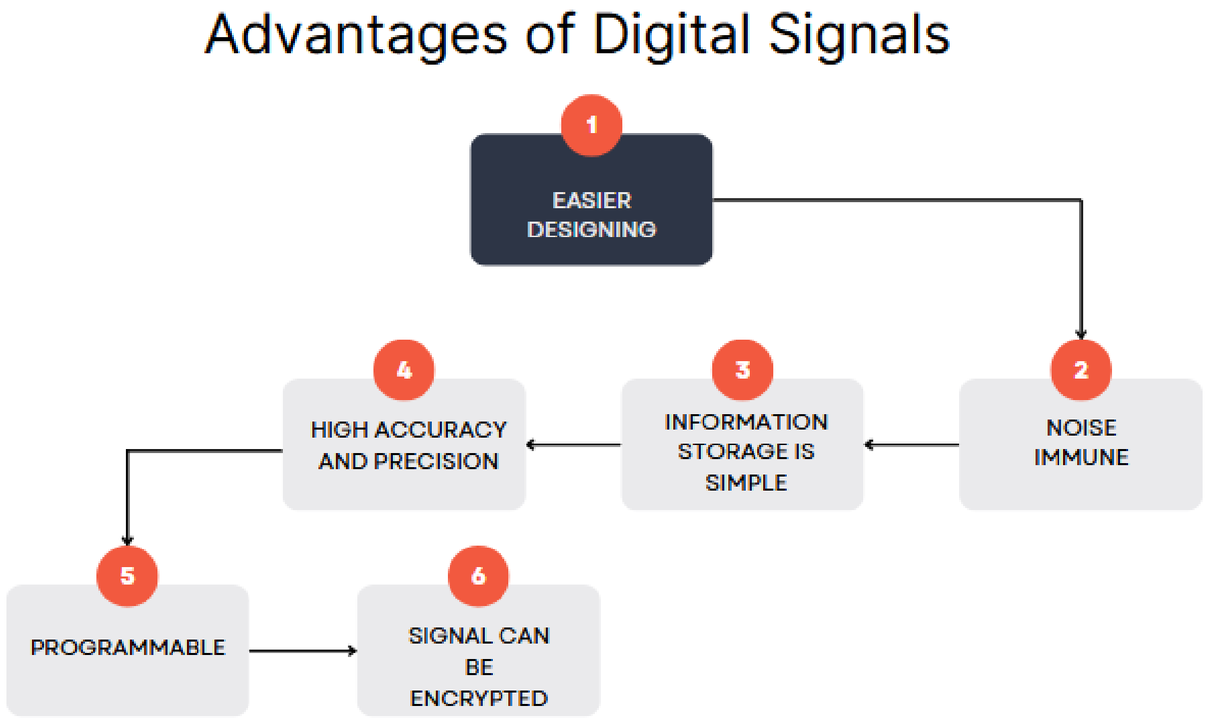
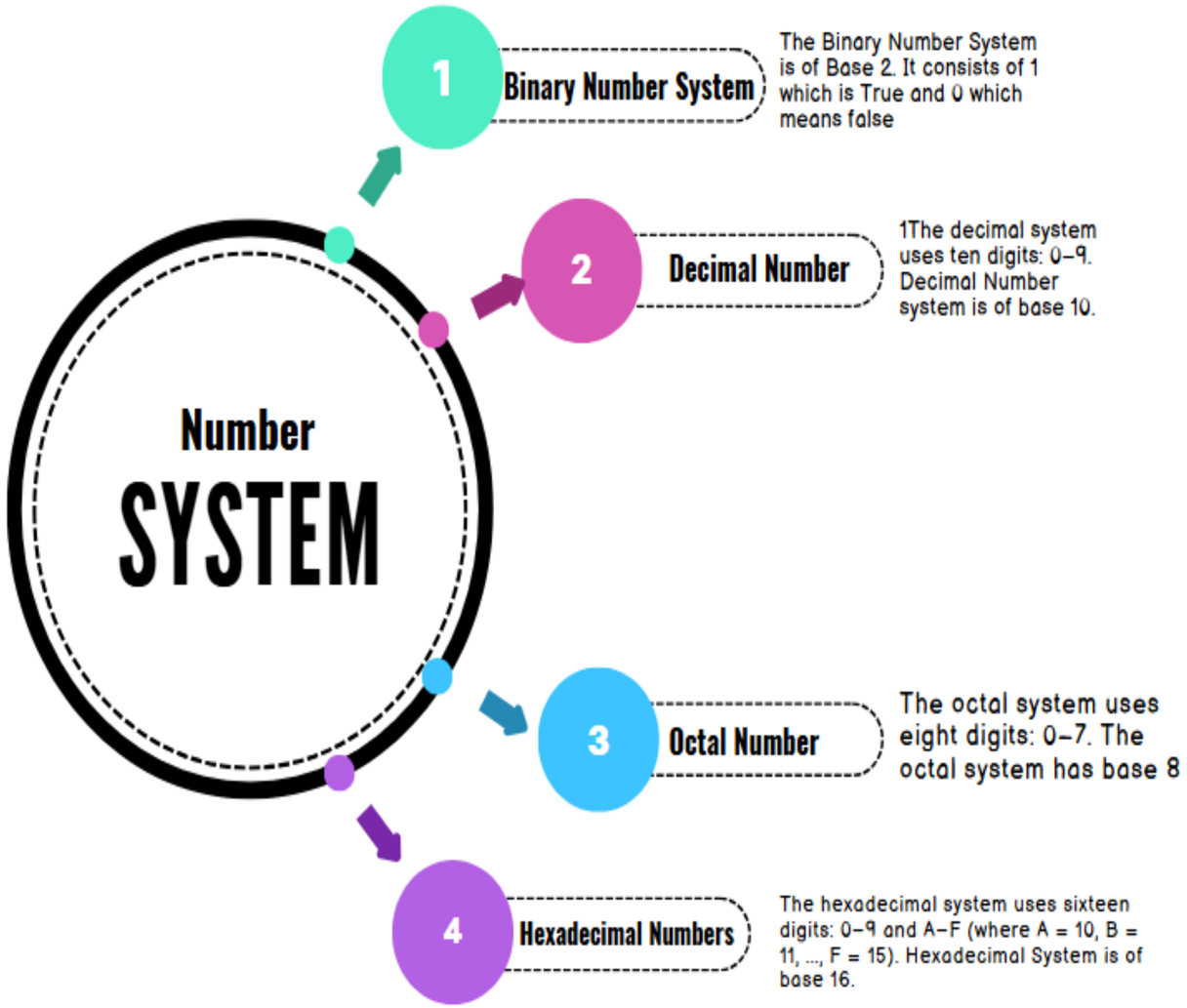
IIIT BHOPAL

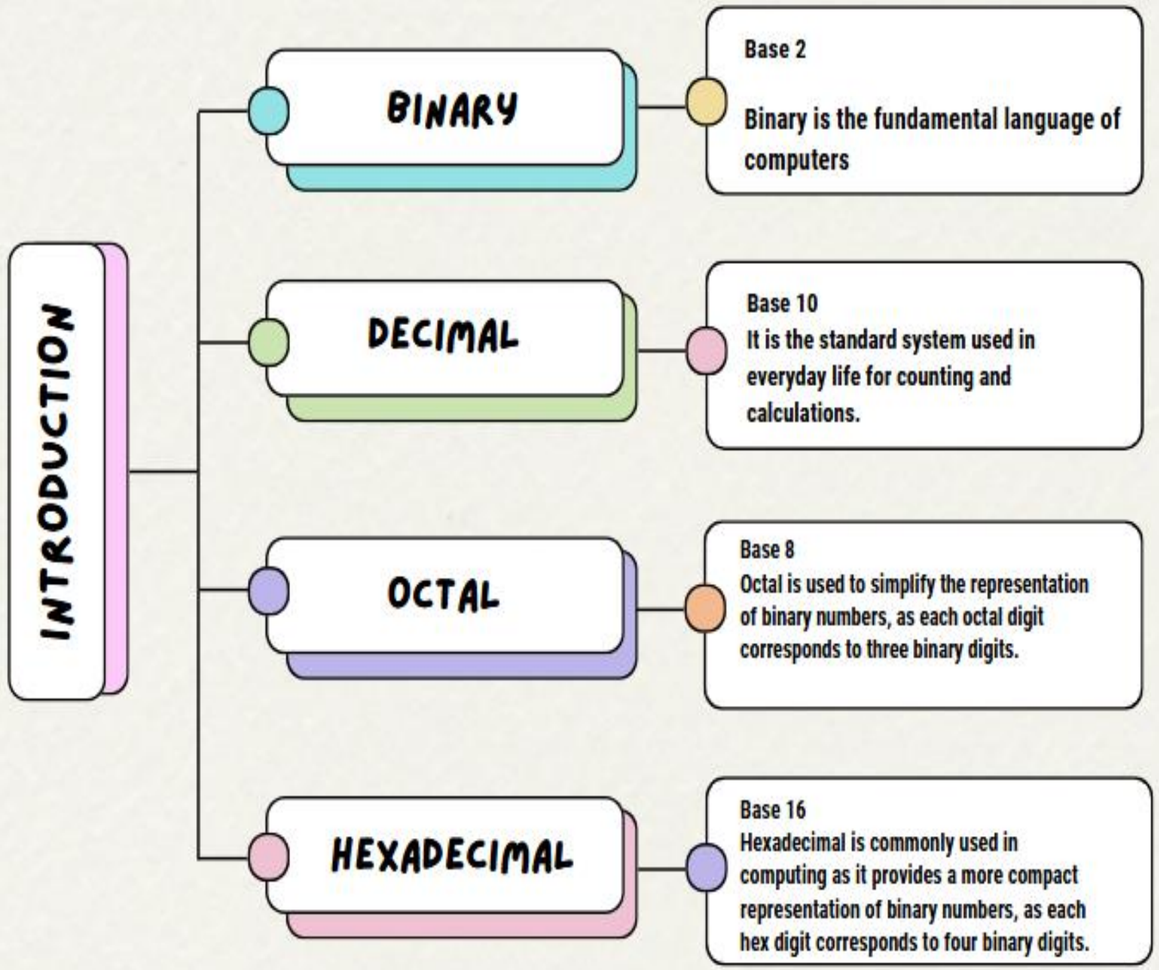
Digital Signals

Digital Signals: A digital signal is a signal that is used to represent data as a sequence of separate values at any point in time



Number Systems and Boolean Algebra





Binary Number System

BINARY NUMBER SYSTEM

The binary number system uses only two digits: 0 and 1. Binary Number System have base 2.

BINARY TO DECIMAL

To Convert Binary to Decimal we multiply each digit by 2 raised to the power of it's position in the number.

COMPUTER SYSTEMS USE BINARY TO PERFORM ALL OPERATIONS.

BINARY NUMBER SYSTEM

IT IS ESSENTIAL IN DATA STORAGE, PROGRAMMING, AND DIGITAL CIRCUIT DESIGN.

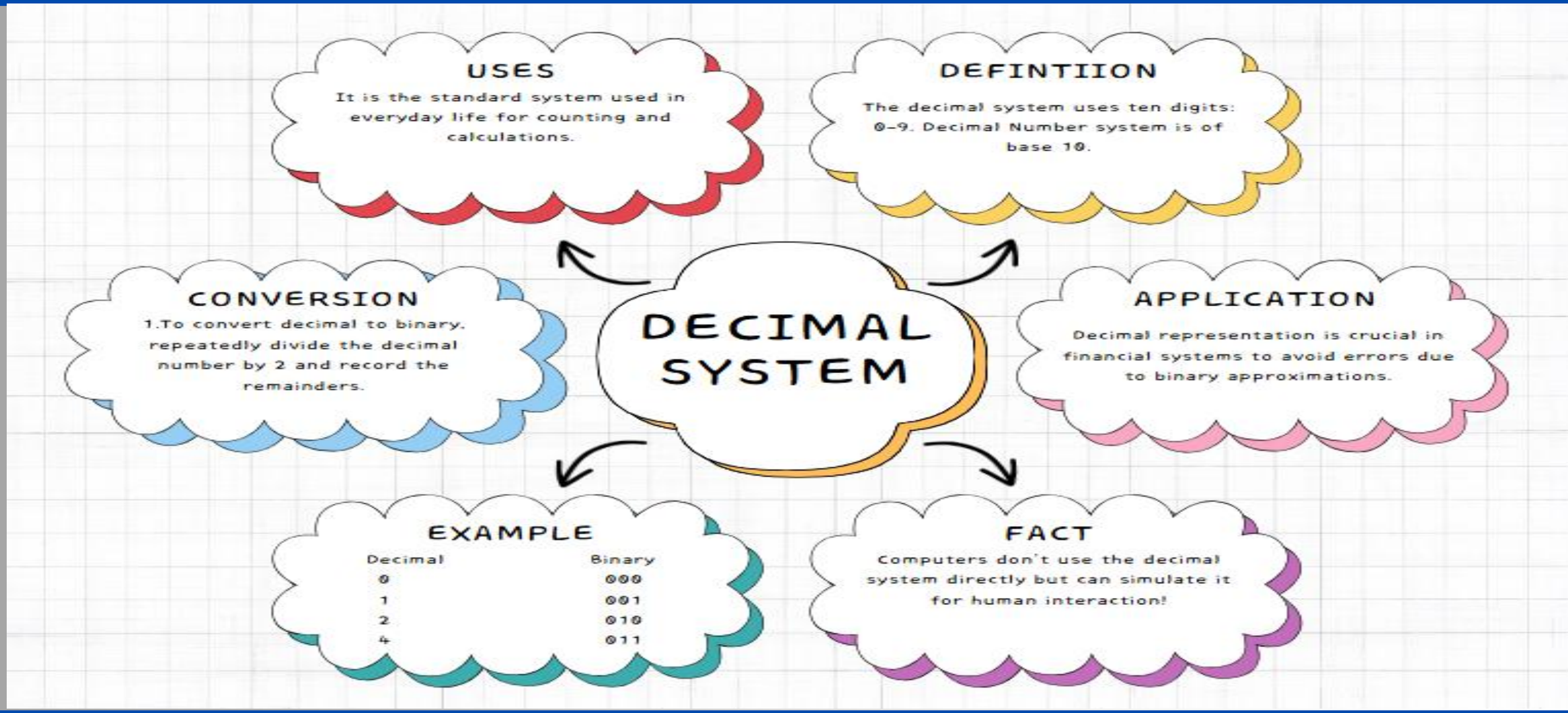
EXAMPLE

Binary: 1010
Decimal = $(1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = 10$ (decimal)

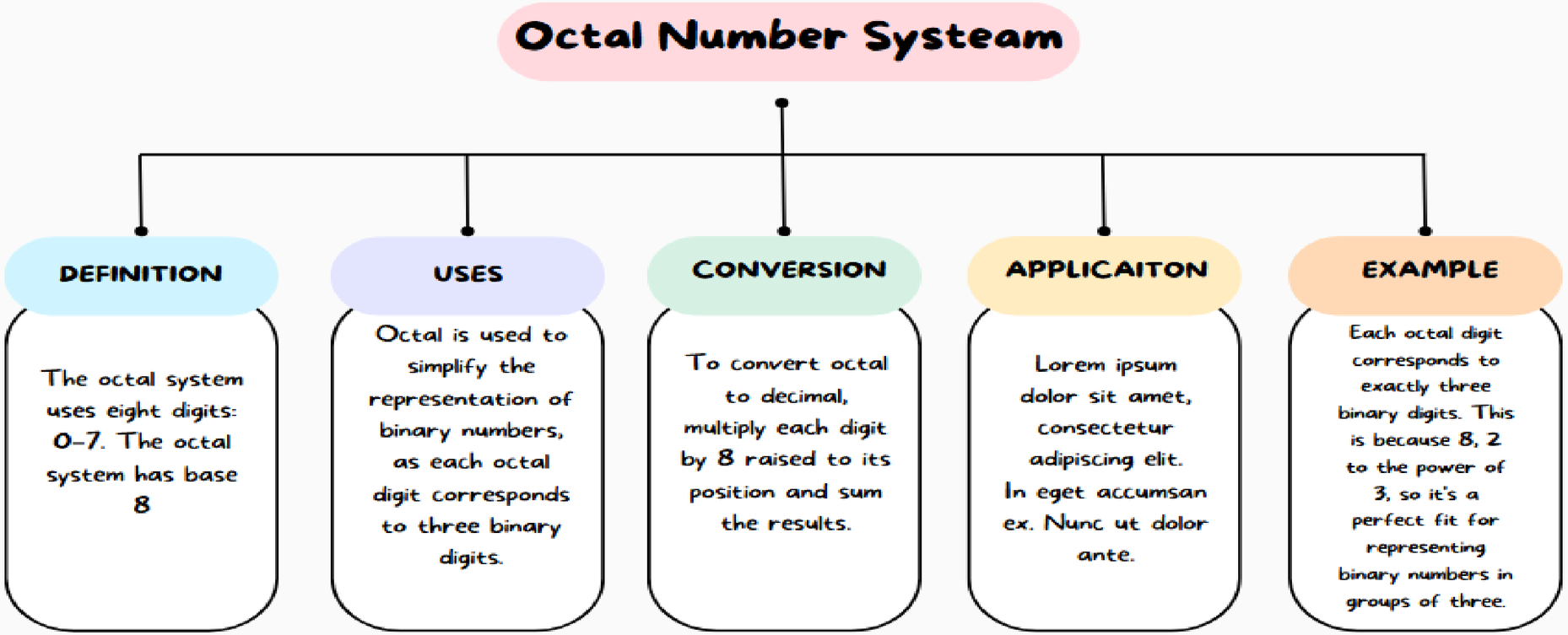
CRAZY FACT

All digital data—movies, music, photos, apps, even the internet itself—is just a massive sequence of 0s and 1s!

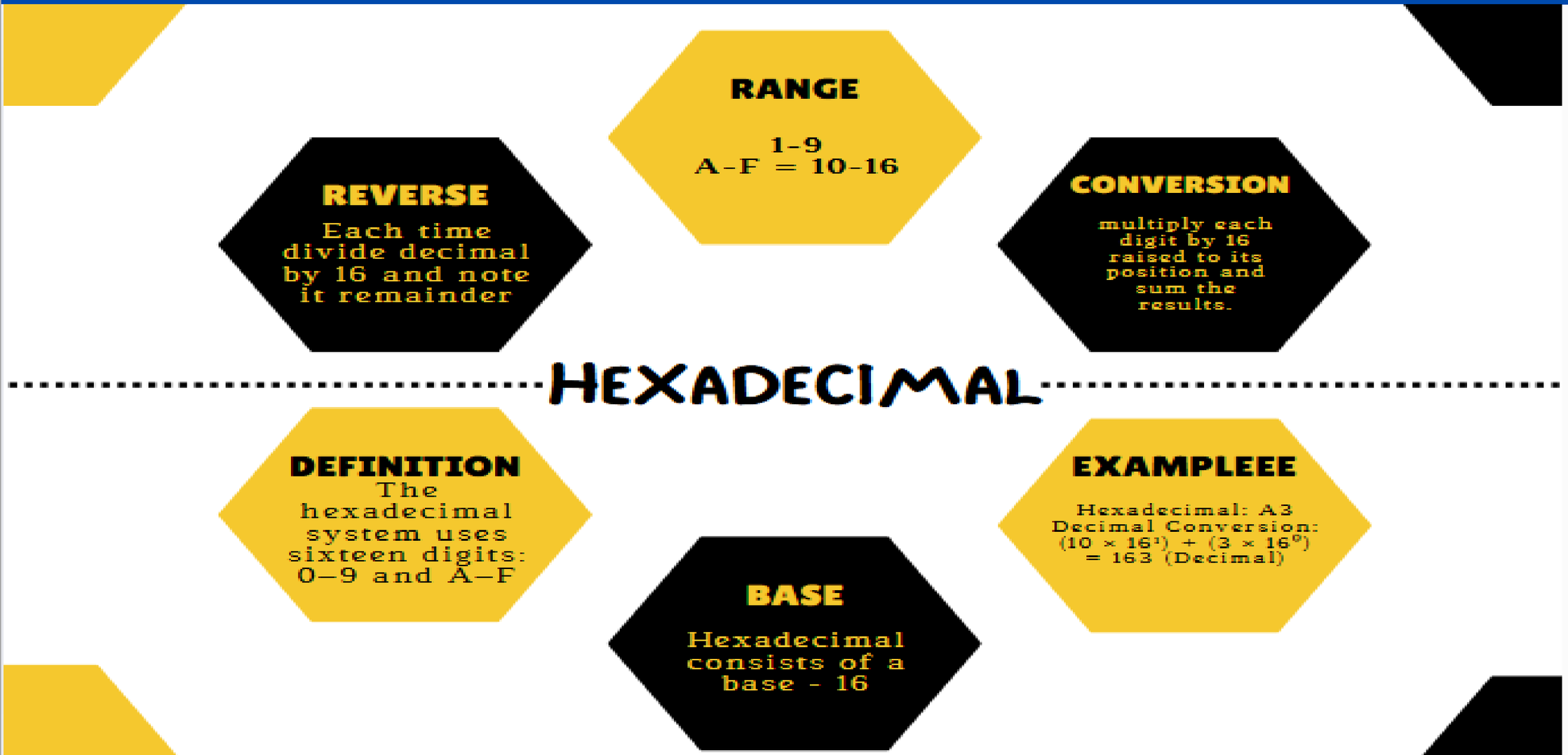
Decimal Number System



Octal Number System



Hexadecimal Number System



Applications of Number Systems

Applications

B Binary Number System

1.Foundation of all digital systems.
2.Used in computer programming, data processing, and storage.

D Decimal Number System

1. Everyday calculations and measurements.
2. Used in computer programming, data processing, and storage.

O Octal Number System

1. Simplifies binary representation in digital systems.
2. Used in UNIX file permissions.

H Hexadecimal Number System

1. Compact representation of binary.
2. Used in memory addressing, color codes in web development, and debugging.

Thanks