Code

Overview of various encoding techniques, focusing on transforming information into symbolic representations like Morse code, fixed-length, and variable-length codes. It also discusses the principles of encoding systems used in technology and communication.

Shannon-Fano method

The Shannon-Fano method is a basic data compression technique where symbols are arranged by their probability of occurrence. The goal is to assign shorter codes to more frequent symbols, optimizing data encoding efficiency

Encoding integers

Explains various methods for encoding integers, focusing on binary representation and how to handle both positive and negative numbers using sign-magnitude and two's complement methods. It includes practical examples, such as converting between decimal and binary systems and performing arithmetic with binary numbers.

BCD encoding

Representing each decimal digit (0-9) with a 4-bit binary sequence, BCD simplifies conversion between binary and decimal

Fixed-Point Number Representation

A method for encoding real numbers where the decimal point's position is fixed, offering hardware simplicity and uniform precision.

Floating-Point representation

Explains how real numbers are stored using the IEEE 754 standard. The number is divided into sign, exponent, and mantissa for efficient handling of large or small values.

Parity Check

A simple error detection method used in data transmission and storage, ensuring data integrity by verifying the even or odd number of 1 bits in binary sequences.

Error detection and correction

Techniques like Elias-style block protection and Hamming codes are explained, focusing on detecting and correcting single-bit errors to maintain data integrity during transmission

Luhn algortithm to protect Credit card numbers

We can use the Luhn algorithm to check if a credit card number is valid.