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Lab Assignment 4

Title: Error detection and correction

Aim: To write a program for error detection and correction using Hamming codes

objectives: 1. To encode and decode original data bits with the help of parity bits

2. To demonstrate use of error control protocols.

Theory:

1) Types of errors:

Errors can be of 3 types: namely single bit errors, multiple bit errors and burst errors.

2) Concept of parity bits

It is a single bit that can be appended to a binary string. It is set to either 1 or 0 to make the total number of 1-bits either even or odd. The purpose of parity bit is to provide a ~~single~~ simple way to check for errors later.

3) Hamming Code example:

Suppose the number of data bit is 7, then the number of redundant bits can be calculated using $= 2^4 >= 7+4+1$.

Thus no of bits is 4 parity bits.

Student Observation:

Thus, successfully executed a program for error detection and correction using Hamming codes.

FAQ's

Ans 1) Flow control is meant only for the transmission of data from sender to reciever. Error control is meant for the transmission of error for data from sender to reciever.

Ans 2) Forward error control and feedback error control are the two types of error control the mechanism used in communications. In forward error control, additional reductant information is also transmitted along with the data. This helps the receiver to detect and determine the location of error in transmitted data.