



Study of error detection and correction codes

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Introduction : Where there are inputs and a corresponding outputs error is ominous. Similarly in case of digital systems in various cases be it a digital computer or a digital communication set up, error occurrence is a common

phenomenon. And for that the first step is to detect the error and after that errors are corrected. The most common cause for errors are that the noise creep into the bit stream during the course of transmission from transmitter to the receiver. And if these errors are not detected and corrected the result could be disastrous as the digital systems are very much sensitive to errors and will malfunction due to the slightest of errors in transmitted codes. There are various methods of error detection and correction such as addition of extra bits which are also called check bits, sometimes they are also called redundant bits as they don't have any information in them. In this article we will discuss about the various codes which are used for error detection and correction code in digital system.

An error-correcting code uses multiple parity check bits that are stored with the data word in memory. Each check bit is a parity bit for a group of bits in the data word. When the word is read back from memory, the parity of each group, including the check bit, is evaluated. If the parity is correct for all groups, it signifies that no detectable error has occurred. If one or more of the newly generated parity values is incorrect, a unique pattern called a syndrome results that may be able to identify which bit is in error. A single error occurs when a bit changes in value from 1 to 0 or from 0 to 1 while stored or if it erroneously changes during a write or read operation. If the specific bit in error is identified, then the error can be corrected by complementing the erroneous bit.



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