Programming Assignment 2

Simulation of realistic error detection and correction by implementation of Cyclic Redundancy Check (CRC)

Assumptions and Limitation :

- The output produced in case no error is might have some preceding 0's that were added on tokenizing the digital stream.

Libraries and languages used :

- graphics library, C++

Implementation :

- If not already installed, install the Graphics Header file. On running the program, the user is prompted to enter the digital data stream to be transmitted, the number of hops considered in the communication system, and the crossover probability 'p' for binary symmetric channel.
- At the senders side, the program divides the input stream into 16 bit datawords and performs CRC on each dataword and finally encodes it. Depending on the crossover probability, random error is either generated or not.
- On the receivers side, the received digital stream is checked for error and if any error is present the data di "Discarded" else the data stream is printed and on a separate window, the input and output streams are produced.

References :

- GeeksforGeeks

Simulation of 7-bit Hamming code using binary symmetric channel and random error generation

Assumptions and Limitation :

- even parity is considered

Libraries and languages used :

- No additional libraries, C++

Implementation :

- On running the program, the user is prompted to enter the digital data stream to be checked for error.
- The program first tokenizes the input stream into 4 bit datawords and encodes every dataword into 7 bit hamming code with the help of parity bits and generates final codeword.
- A random error is introduced in the generated codeword. If an error is found in a particular token, using the parity bits tokenwise error correction is done. Finally the corrected codeword is printed.

References :

- GeeksforGeeks
- https://github.com/Akhil-Suden/CRC-Hammimg-Code-Project

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