



## **DATA COMMUNICATION**

### **PROJECT REPORT**

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### **CRC**

Introduction:

CRC 8 detects the occurrence of any errors during the transmission of the digital signal by appending some zeroes and generating the code word using the generator  $(x^8 + x^2 + x + 1)$

Language and Libraries used:

The digital signal is plotted using graphics of c++ and the logic being behind CRC-8 is implemented using c++

Instructions to run the program:

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 data words and performs CRC on each data word 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 is discarded else the data stream is printed and on a separate window, the input and output streams are produced.

References:

Geeks for geeks  
Stack Overflow

## **HAMMING CODE**

Introduction:

In this coding method, the source encodes the message by inserting redundant bits within the message. These redundant bits are extra bits that are generated and inserted at specific positions in the message itself to enable error detection and correction. When the destination receives this message, it performs recalculations to detect errors and find the bit position that has error.

Instructions to run the program

At the senders side, some redundant bits are added to the data stream at bit positions of powers of 2. These redundant bits are parity bits and these bit values are calculated based on the bit values of the data stream.

At the receivers side, the number of redundant bits is calculated and positioning of the bits is also determined following which a parity check is performed using XOR operator. Error detection and correction is the final step of the decoding procedure( if the bit has error, its value is flipped).

References:

Geeks for Geeks  
Stack Overflow