Introduction to Error Correction Codes

Project 2

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CRC Encoding and Decoding

- Write a c++ class CRC16 to compute the 16-bit parity bits for a stream of data.
- Let $g(x) = 1+x^2+x^{15}+x^{16}$ be the generator polynomial.
- The class is defined as

```
class CRC16{
   private:
        int *gx;
        int *data_enc;
        int *state_temp, state_pre;
        int deg_gx;
   public:
        /* data_in = the data to be encoded,
            [len] = number of bits to be encoded,
            data_out = the encoded output*/
        void crc_enc(int* data_in, int* data_out, int len);
        void crc_dec(int* dec_in, int *dec_out, int len_dec_in);
        void Malloc(int* gx, int deg_gx);
        void Free();
};
```

CRC Encoding and Decoding

- Test your program with a message with block length 1024.
- Test your program further by passing the encoded data through a ***binary symmetric channel***. Try channel crossover probabilities of 0.0001, 0.001, 0.01 and 0.1. Calculate the ***probabilites of undetected errors***.