LAB ASSIGNMENT-7

CSN-361
Computer Networks Laboratory

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1

Problem Statement

Transmit a binary message (from a sender to a receiver) using socket programming in C and report whether the received msg is correct or not; using the following error detection algorithms:

1. Single Parity Check
2. Two-dimensional Parity Check
3. Checksum
4. Cyclic Redundancy Check (CRC)

Algorithm

1. Create a sender with a socket it is listening to.
2. Create a receiver to connect to the socket.
3. The sender requests user for relevant information.
4. Then after adding error to the message and its encoding it passes the information to the receiver using a buffer.
5. The receiver receives, parses and checks if the data was correctly encoded and transmitted based upon the algorithm.

Data Structures used

Char, int arrays, flags and sockets.

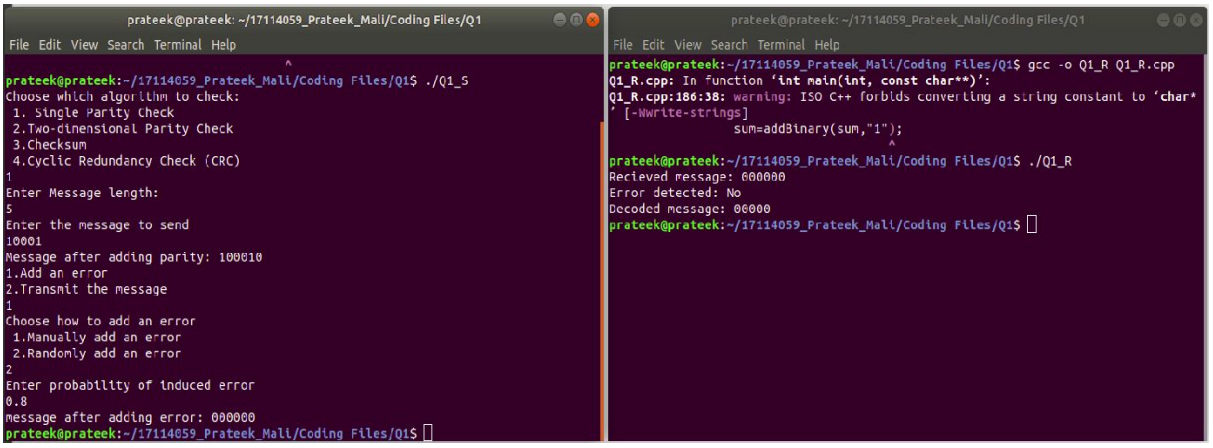
Code Snippets

Code is quite big so the screenshots can't be added. Code can be seen in Coding Files folder.

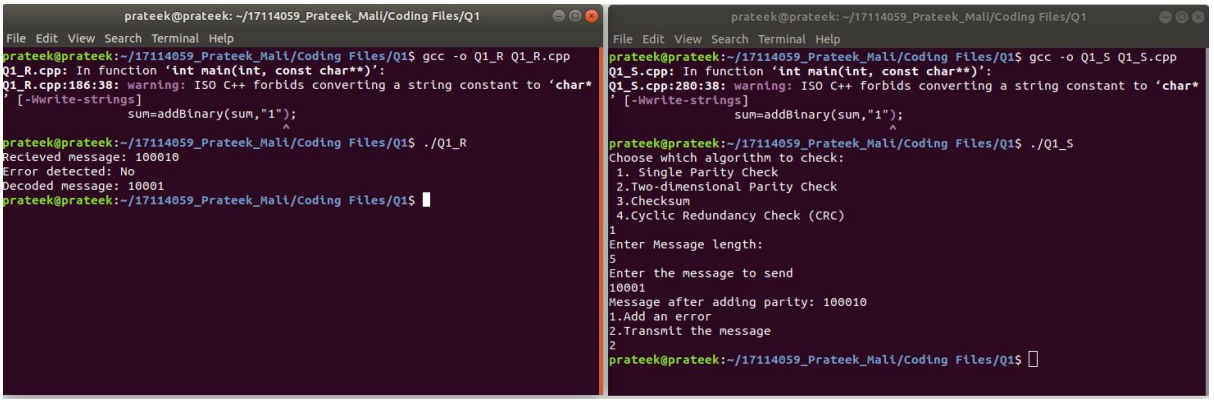
Screenshots of running code

Single Parity Check :-

Example - 1

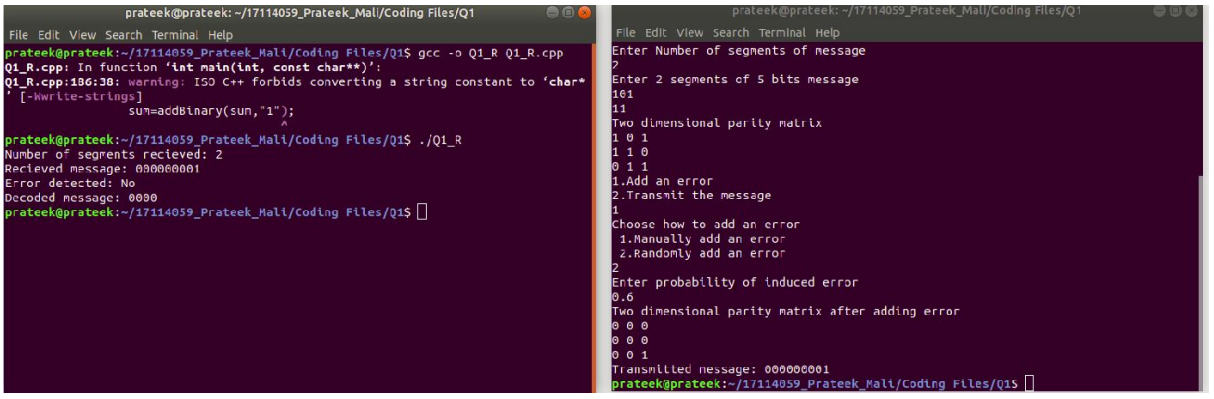


Example - 2

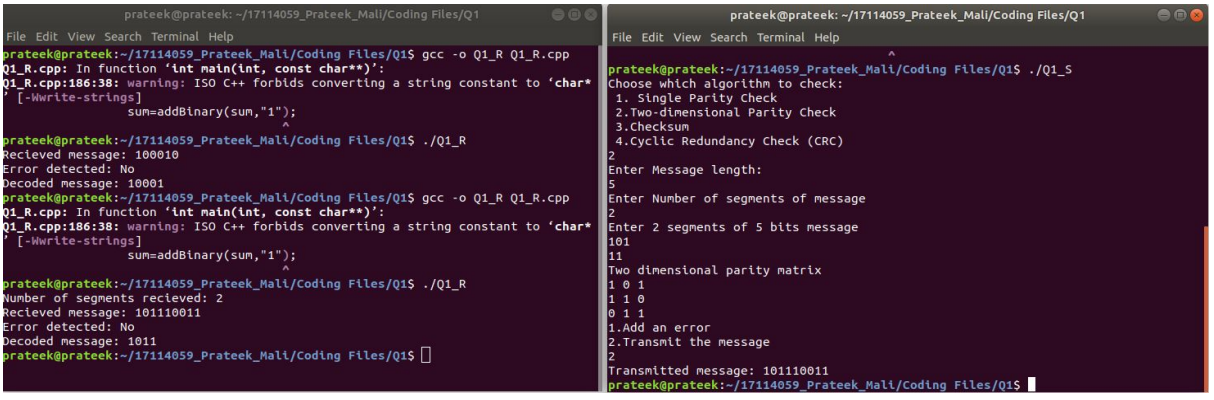


Two-dimensional Parity Check :-

Example - 1

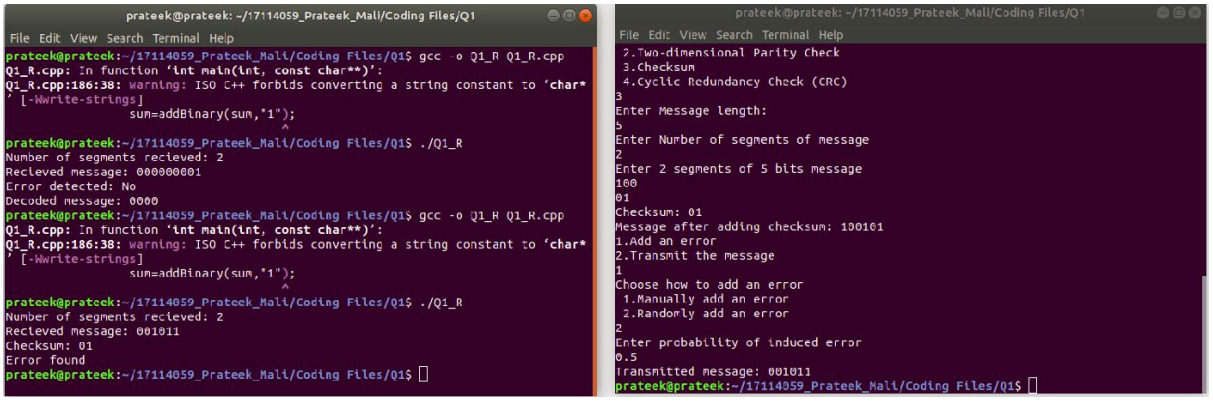


Example - 2

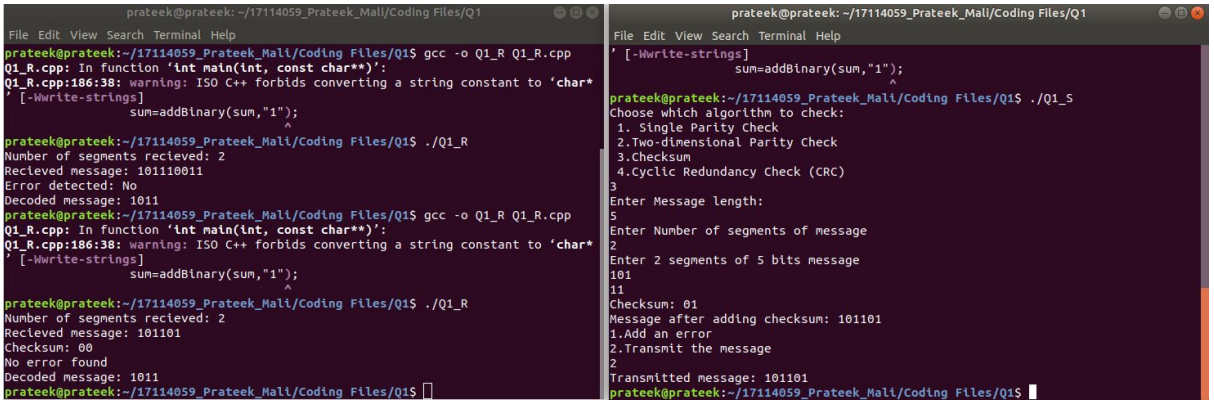


Checksum :-

Example - 1

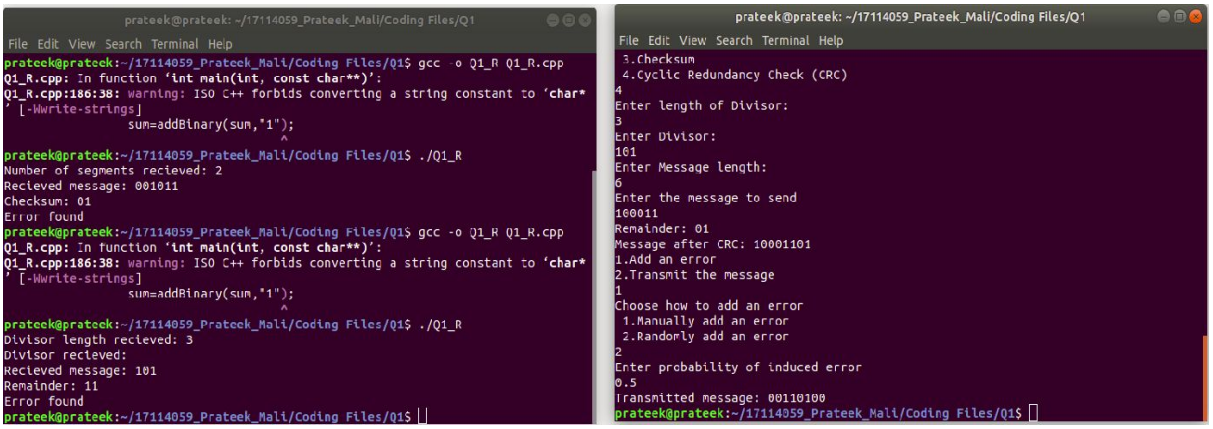


Example - 2

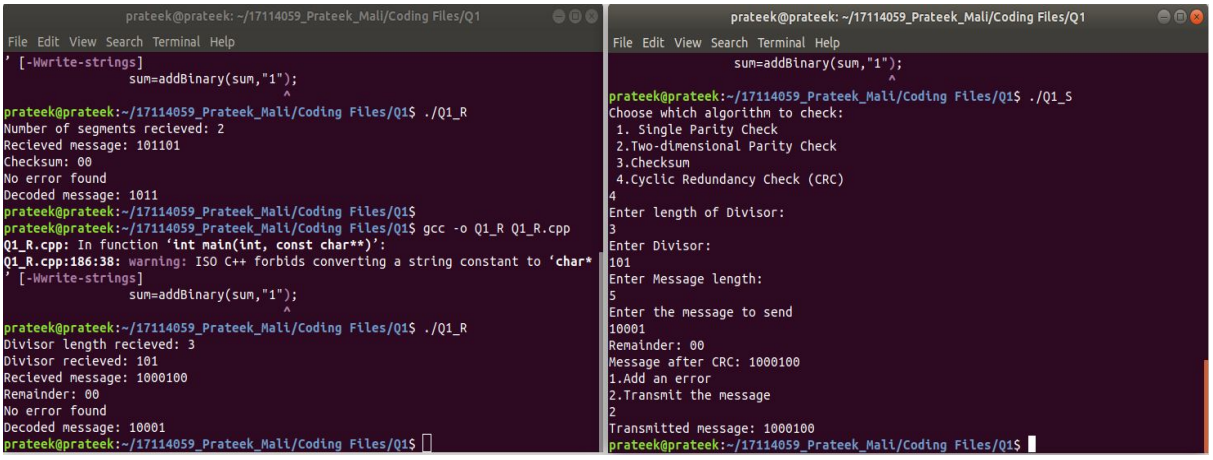


Cyclic Redundancy Check :-

Example - 1



Example - 2



2

Problem Statement

Transmit a binary message (from a sender to a receiver) using socket programming in C. Using Hamming code, detect and correct errors in the transmitted message, if any.

Algorithm

1. Create a sender with a socket it is listening to.
2. Create a receiver to connect to the socket.
3. The sender requests the user for relevant information on size,data and error requirement and passes it to the receiver by sending the relevant parameters and errors to the buffer.
4. The sender encode it using the Hamming code to generate the final message .
5. The receiver receives, parses and checks if the data was correctly encoded and transmitted based on the Hamming code and finds if the code is corrupted.

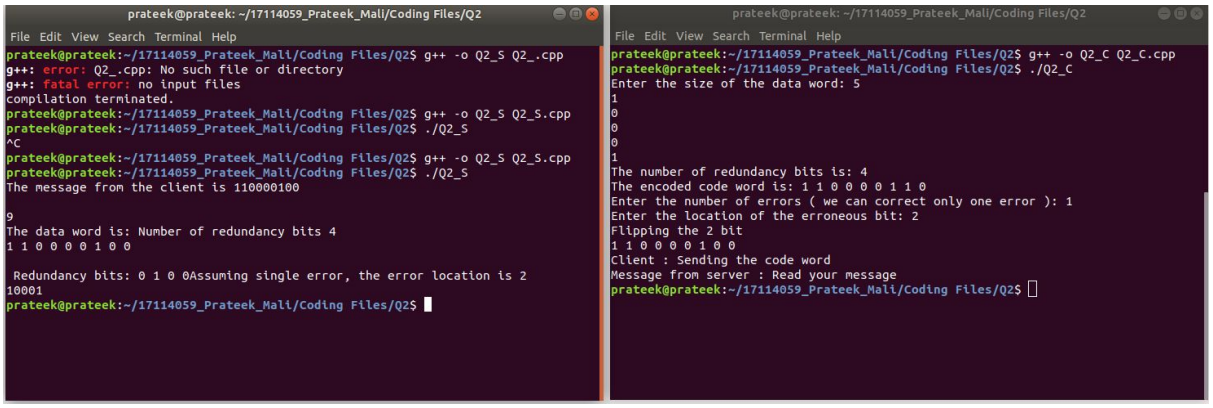
Data Structures used

Char, int arrays, flags and sockets.

Code Snippets

Code is quite big so it's screenshots can't be added. Code can be seen in Coding Files folder.

Screenshots of running code



3

Problem Statement

Write a C++ program to compress a message non-binary, can be anything like a text message or a code like hexadecimal, etc.) using the following data compression algorithm:

1. Huffman
2. Shannon-Fano

Algorithm

Huffman & Shannon-Fano are used for constructing a prefix code based on a set of symbols and their probabilities. The main objective is to generate a prefix code to encode the file data.

1. Pass the file to the program.
2. Select the algorithm.
3. Encode the files.
4. Save the results in output.txt file.

Data Structures used

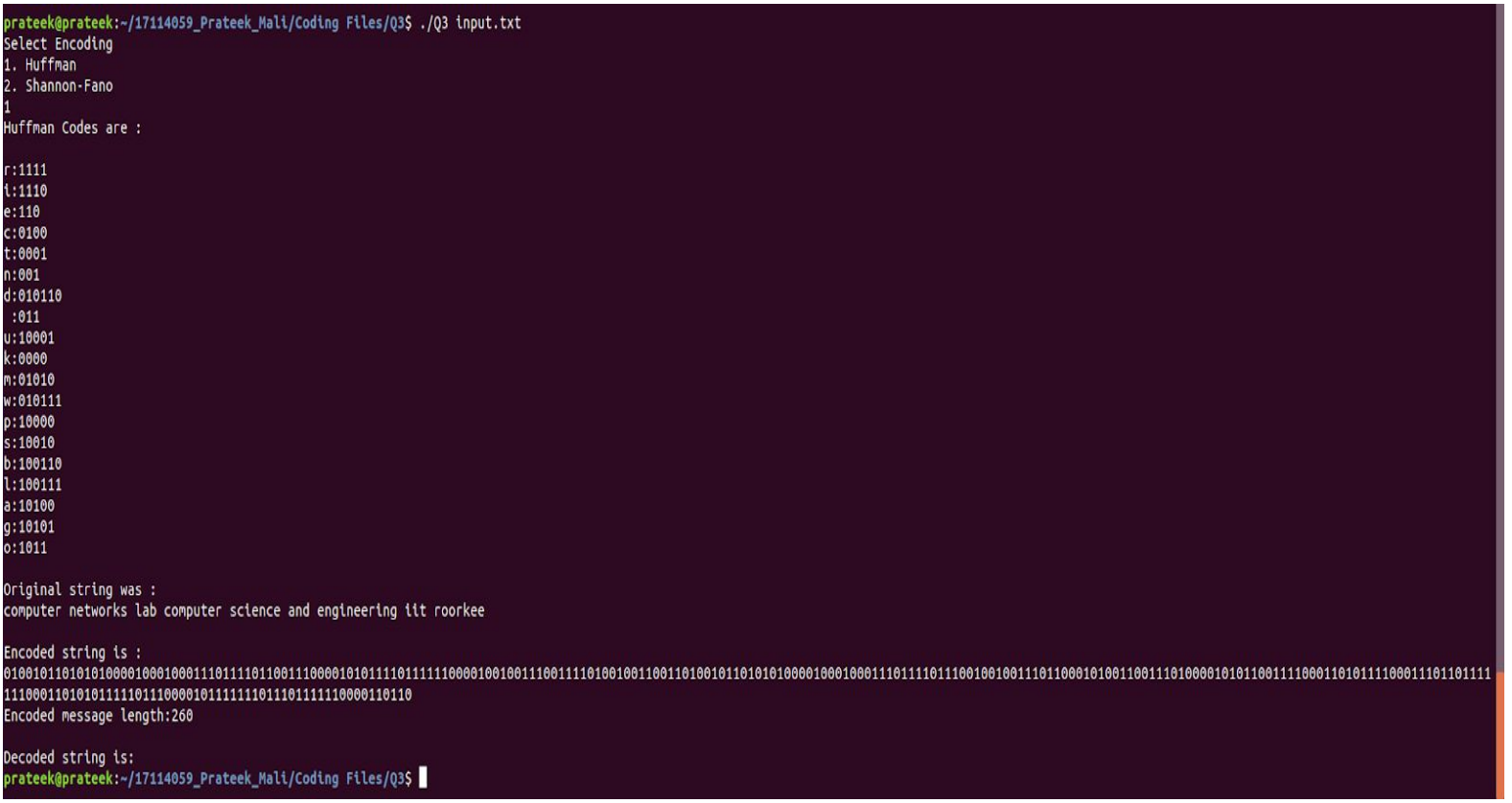
Char, int arrays, flags and sockets.

Code Snippets

Code is quite big so it's screenshots can't be added. Code can be seen in Coding Files folder.

Screenshots of running code

Huffman :-



Shannon Fano :-

```
Select Encoding
1. Huffman
2. Shannon-Fano
2

19
e       0.151515        00
        0.121212        010
n       0.090909        0110
r       0.090909        0111
t       0.075758        100
o       0.075758        1010
c       0.060606        1011
t       0.060606        1100
a       0.030303        11010
g       0.030303        110110
k       0.030303        110111
m       0.030303        11100
p       0.030303        111010
s       0.030303        111011
u       0.030303        111100
b       0.015152        111101
d       0.015152        111110
l       0.015152        1111110
w       0.015152        1111111

10111010111001110101111001100000111010011000110011111111010011111011111101101011111101101011101010111010111001110101111001100000111010111011101110000011010110001011010011011111001000011011011010001100000011100011011001010010011000100111101010100111101110000

Length of encoded message : 266

prateek@prateek:~/17114059_Prateek_Mali/Coding Files/Q3$
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