CS307
Assignment 4

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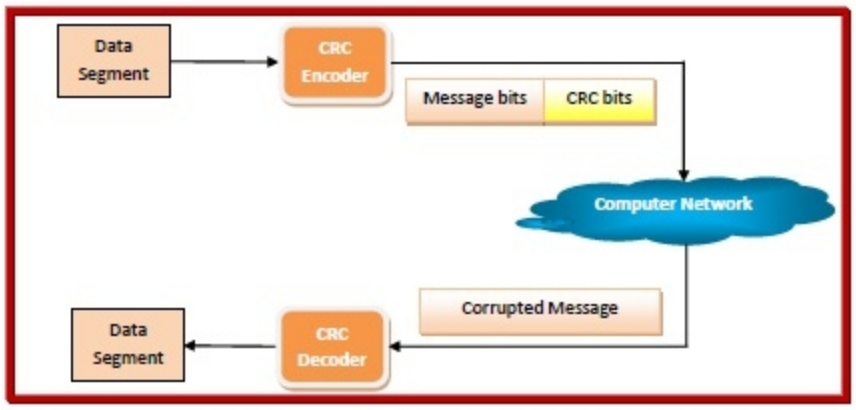
Video link : https://youtu.be/iyKU29E5MWM

Question 1:

- Build and run instructions mentioned in Readme.md
- Language: Cpp
- Objective: Multi-user File transfer application which supports very large files
- Result: We created a multi user application which enabled lossless transmission of text files. The application also kept track of information for active users.

Question 2: Error Control

Objective : Error Control is important as it ensures that data transferred over the network doesn't get corrupted. In this task, you have to perform error detection. Error detection is a challenging task because the receiver has to decide if received data is correct or not, without having a copy of the original message. Burst errors are errors in which 2 or more bits in the data unit have changed. Cyclic Redundancy Check(CRC) is an algorithm that is used to detect such errors.



Cyclic Redundancy Check (CRC) is a block code that was invented by W. Wesley Peterson in 1961. It is commonly used to detect accidental changes to data transmitted via telecommunications networks and storage devices.

CRC involves binary division of the data bits being sent by a predetermined divisor agreed upon by the communicating system. The divisor is generated using polynomials. So, CRC is also called polynomial code checksum.

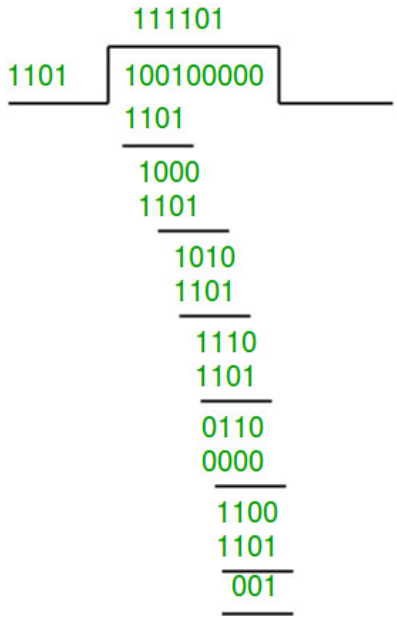
Before sending the message over network channels, the sender encodes the message using CRC. The receiver decodes the incoming message to detect error. If the message is error-free, then it is accepted, otherwise, the receiver asks for re-transmission of the message.

Example

Data word to be sent - 100100

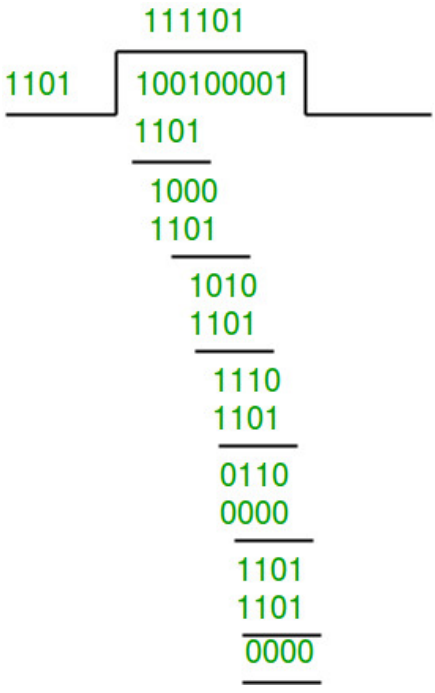
Key - 1101 [Or generator polynomial x3 + x2 + 1]

Sender Side:



Therefore, the remainder is 001 and hence the encoded data sent is 100100001.

Receiver Side:
Code word received at the receiver side 100100001



Therefore, the remainder is all zeros. Hence, the

data received has no error.

If the remainder here is not zero then there is error in transmission.

Q3.

- ❖ LocalIP address of machine 1: 49.36.179.36
- ❖ Local IP address of machine 2: 192.168.43.107
- ❖ Local IP address of machine 1: 172.17.0.1
- External and local IP addresses both serve the same purpose, the difference is scope. An external or public IP address is used across the entire Internet to locate computer systems and devices. A local or internal IP address is used inside a private network to locate the computers and devices connected to it.
- 1) _gateway (192.168.43.90) 3.174 ms 3.117 ms 4.605 ms (location -)
- 2) * * *
- 3) 10.50.90.181 (10.50.90.181) 75.773 ms 76.274 ms 75.778 ms (Location -)
- 4) 10.61.37.42 (10.61.37.42) 74.527 ms 10.61.37.50 (10.61.37.50) 72.455 ms 10.61.37.42 (10.61.37.42) 72.529 ms (Location -)
- 5) 125.19.2.37 (125.19.2.37) 73.427 ms 73.520 ms 73.302 ms (Location Pune, Maharashtra, India)
- 6) 116.119.57.26 (116.119.57.26) 77.566 ms 182.79.177.104 (182.79.177.104) 81.276 ms 116.119.57.24 (116.119.57.24) 73.863 ms (Location Delhi, India)
- 7) 72.14.212.48 (72.14.212.48) 77.350 ms 30.080 ms 27.313 ms (Location Mountain View, California, USA)
- 8) 10.252.182.254 (10.252.182.254) 26.569 ms 32.474 ms 10.252.184.62 (10.252.184.62) 44.615 ms (Location -)
- 9) 142.250.214.98 (142.250.214.98) 49.321 ms 142.250.227.70 (142.250.227.70) 39.099 ms 74.125.251.132 (74.125.251.132) 55.996 ms (Location Mountain View, California, USA)
- 10) 108.170.248.210 (108.170.248.210) 45.462 ms 142.250.235.11 (142.250.235.11) 51.688 ms 51.763 ms (Location Mountain View, California, USA)
- 11) bom12s08-in-f14.1e100.net (142.250.67.206) 39.942 ms 37.913 ms 108.170.248.177 (108.170.248.177) 56.150 ms (Location Mountain View, California, USA)