CS359 Computer Networks Lab
Lab Exercise

Indian Institute of Technology, Patna
April 04, 2022

Question1:

Objective: Write a program for error detection and correction for ASCII codes using Hamming Codes. Demonstrate the packets captured traces using Wireshark Packet Analyzer Tool for peer-to-peer mode.

Explanation: Hamming Codes fall under the category of linear Block codes of Forward Error Correcting (FEC) codes. To understand how it can be constructed, consider the simplest (7,4) hamming code. The notation(7,4) indicates that the codewords are of length 7 bits. Out of these 7 bits, 4 bits are the original message, and the remaining 3 bits are added for detecting and correcting errors. These remaining 3 bits are called redundant bits. The structure can be indicated as follows: 4 message bits + 3 redundant bits 7 bit Hamming code. Generally, the linear block codes can be represented in two forms. One is called Systematic form and the other is called non-Systematic form. In Systematic Coding, the redundant bits are calculated from the message bits and both are concatenated side by side. Just by looking at the codeword, you can identify the message portion and the redundant portion.

Question 2:
Objective: Write a program for error detection and correction for ASCII codes using CRC(**Cyclic Redundancy Code**).

Explanation:

Cyclic Redundancy Check (CRC) is a block code 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.

Submission Instructions and Deadline

You are required to provide the screenshots in support of your answer for each question in a PDF file and submit the .pdf file along with the .pcap file on or before **April 11, 2022 (11:59 PM)**. The name of the PDF file is your rollno.pdf and the name of the .pcap file is rollno.pcap. (For

example, if your roll no is 2011CS26, then the files should be named 2011CS26.pdf and 2011CS26.pcap)