Nepal College of Information Technology
Balkumari, Lalitpur
(Affiliated to Pokhara University)

A Lab Report
On

Bidirectional Communication in TCP Client-Server Model with String Manipulation

Submitted as partial fulfillment of requirement of the curriculum of Bachelor's of Engineering in Software Engineering (6th Semester)

Submitted by:
Harsh Chaudhary Kalwar
(221715)

Submitted to:
Madan Bhandari

Date:
12th May, 2025

Objective:

The objective of this lab was to enhance the TCP client-server interaction by enabling message exchange. Specifically, the client sends a string message, and the server processes the message and returns it in uppercase. This helps demonstrate two-way communication using sockets.

Lab Tasks and Execution:

1. Setup and Compilation:

→We reused the same working environment as the previous lab: Fedora OS and directory /Documents/rrlab3.

Commands Executed

- cd /Documents/rrlab3
- gcc -o server server.c
- gcc -o client client.c
- ./server 5556
- ./client 127.0.0.1 5556

2. Enhanced Client-Server Communication:

Client Side (client.c)

- Connected to the server at port 5556.
- Sent a user-input message (e.g., "hello network").
- Received the modified message back (e.g., "HELLO NETWORK") and displayed it.

Server Side (server.c)

- Waited for client connections.
- Received the message from the client.
- Converted it to uppercase using a loop or toupper().
- Sent the modified string back to the client.

Output / Observations:

- The client successfully sent messages like:

"hello network programming"

- The server received and processed them, then returned:

"HELLO NETWORK PROGRAMMING"

- Round-trip communication was verified using print statements in both programs.

Conclusion:

This lab demonstrated a full-duplex TCP communication model where the client and server both actively exchanged data. It reinforced concepts like string handling, socket programming, and data flow between two programs over the network.