Assignment - 06

Title -> TCP Sockets

Problem Statement : Write a program in C/C++ using TCP sockets for following
① Echo ② File Transfer ③ Calculator
④ Trigonometric Calculation.

Objective : Understand socket programming sharing resources using TCP Protocol.

Outcome : Will be able to implement socket programming using TCP sockets & perform operations using it.

S/W Requirements :
            Linux 64 bit, PC with config

H/W Requirements :
            Monitor, Keyboard, Mouse etc.

Theory

① Socket Programming → It is a way of connecting 2 nodes on a network to communicate with each other, one server/socket listen on a port while other client reaches out to form a connection
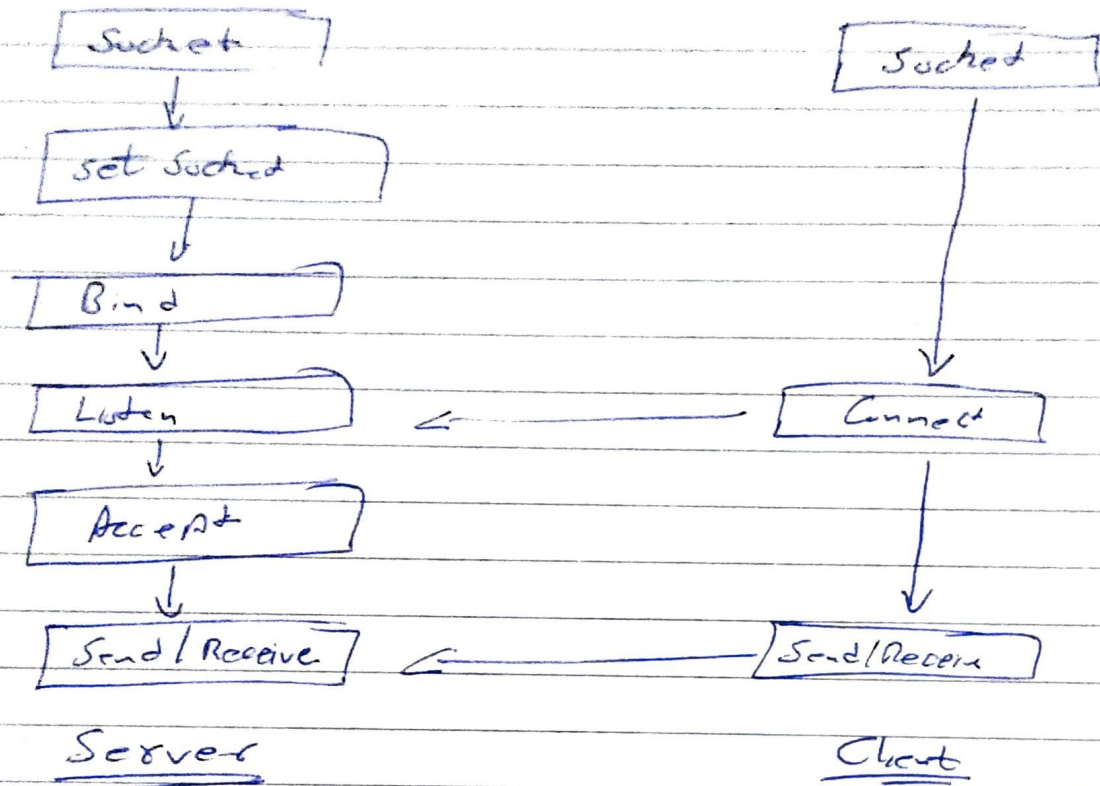
① TCP - Transmission Control Protocol

① Connection oriented protocol, gaurentee that data transferred remains exact & arrives in order

② TCP does flow control & requires 3 packets to set up socket communication before any resource sharing.

③ Handles error Checking

Socket Types

① Stream sockets

② Datagram sockets

③ Raw sockets

④ Sequenced sockets.

TCP Client - Server

```
┌──────────────┐                          ┌──────────────┐
│   Socket     │                          │   Socket     │
└──────┬───────┘                          └──────┬───────┘
       │                                         │
┌──────▼───────┐                                 │
│  set Socket  │                                 │
└──────┬───────┘                                 │
       │                                         │
┌──────▼───────┐                                 │
│    Bind      │                                 │
└──────┬───────┘                                 │
       │                                         │
┌──────▼───────┐        ◄───────────    ┌────────▼─────┐
│   Listen     │                        │   Connect    │
└──────┬───────┘                        └──────┬───────┘
       │                                       │
┌──────▼───────┐                               │
│   Accept     │                               │
└──────┬───────┘                               │
       │                                       │
┌──────▼───────┐        ◄───────────    ┌──────▼───────┐
│ Send/Receive │                        │ Send/Receive │
└──────────────┘                        └──────────────┘

      Server                                   Client
```

Conclusion

I successfully learnt & implemented TCP sockets and perform the required operations.