TITLE	TCP Socket Programming.
PROBLEM STATEMENT /DEFINITION	Write a program (C/C++) using TCP socket for wired network for following a. Say Hello to Each other (For all students) b. File transfer (For all students) c. Calculator (Arithmetic) (50% students) d. Calculator (Trigonometry) (50% students) Demonstrate the packets captured traces using Wireshark Packet Analyzer Tool for peer to peer mode.
OBJECTIVE	• To implement socket programming for TCP.
S/W PACKAGES AND HARDWARE APPARATUS USED	1.Operating Systems (64-Bit)64-BIT Fedora 20 or latest 64-BIT Update of Equivalent Open source OS 2. Programming Tools (64-Bit) GCC/G++ Latest Open source update of Eclipse Programming frame work 3. Wire-shark.
REFERENCES	• Fourauzan B., "Data Communications and Networking", 5 th Edition, Tata McGraw- Hill, Publications, ISBN: 0 – 07 – 058408 – 7 • Thomas D. Nadean and Ken Gray, — Software Defined Network, O'REILLY, ISBN: 13:978-93-5110-264-9 • Michael J. Donahoo, Kenneth L. Calvert, “TCP/IP Sockets in C: Practical Guide for Programmers”, Elsevier.
INSTRUCTIONS FOR WRITING JOURNAL	• **Date** • **Assignment no.** • **Problem definition** • **Learning objective** • **Learning Outcome** • **Concepts related Theory** • **Program code with proper documentation.** • **Output of program.**

	• **Conclusion and applications** (**the verification and testing of outcomes).**

Assignment 6

- **Aim**

  Write a program (C/C++) using TCP socket for wired network for following

a. Say Hello to Each other (For all students)

b. File transfer (For all students)

c. Calculator (Arithmetic) (50% students)

d. Calculator (Trigonometry) (50% students)

Demonstrate the packets captured traces using Wire-shark Packet Analyzer Tool for peer to

peer mode.

- **Prerequisites**
  - Concept of various attributes such as
    - TCP Protocol
    - Connection oriented services
    - Socket programming
  - Object oriented programming features.

- **Learning Objectives**
  - To understand the basic Socket Programming.
  - To understand the basic Connection oriented services using TCP protocol.
- **Learning Outcome**

  After successfully completing this assignment, Student should be able to
  - Understand & Implement TCP using Socket programming.

Success:

Finally, Students can Implement TCP Socket programming prescribed above successfully.

Failure:

Couldn't reach to remote machine.

- **Concepts related Theory**

Students have to refer above mentioned books for TCP protocol Data transfer.

TCP Socket Programming:

The steps for creating a simple server program are:

1. Open the Server Socket:

ServerSocket

server = new ServerSocket(PORT);

2. Wait for the Client Request:

Socket client = server.accept();

3. Create I/O streams for communicating to the client

DataInputStream is = new DataInputStream(client.getInputStream());

DataOutputStream os = new DataOutputStream(client.getOutputStream());

4. Perform communication with client

Receive from client: String line = is.readLine();

Send to client: os.writeBytes(“Hello\n”);

5. Close socket:

client.close();

The steps for creating a simple client program are:

1. Create a Socket Object:

Socket client = new Socket(server, port_id);

2. Create I/O streams for communicating with the server.

is = new DataInputStream(client.getInputStream());

os = new DataOutputStream(client.getOutputStream());

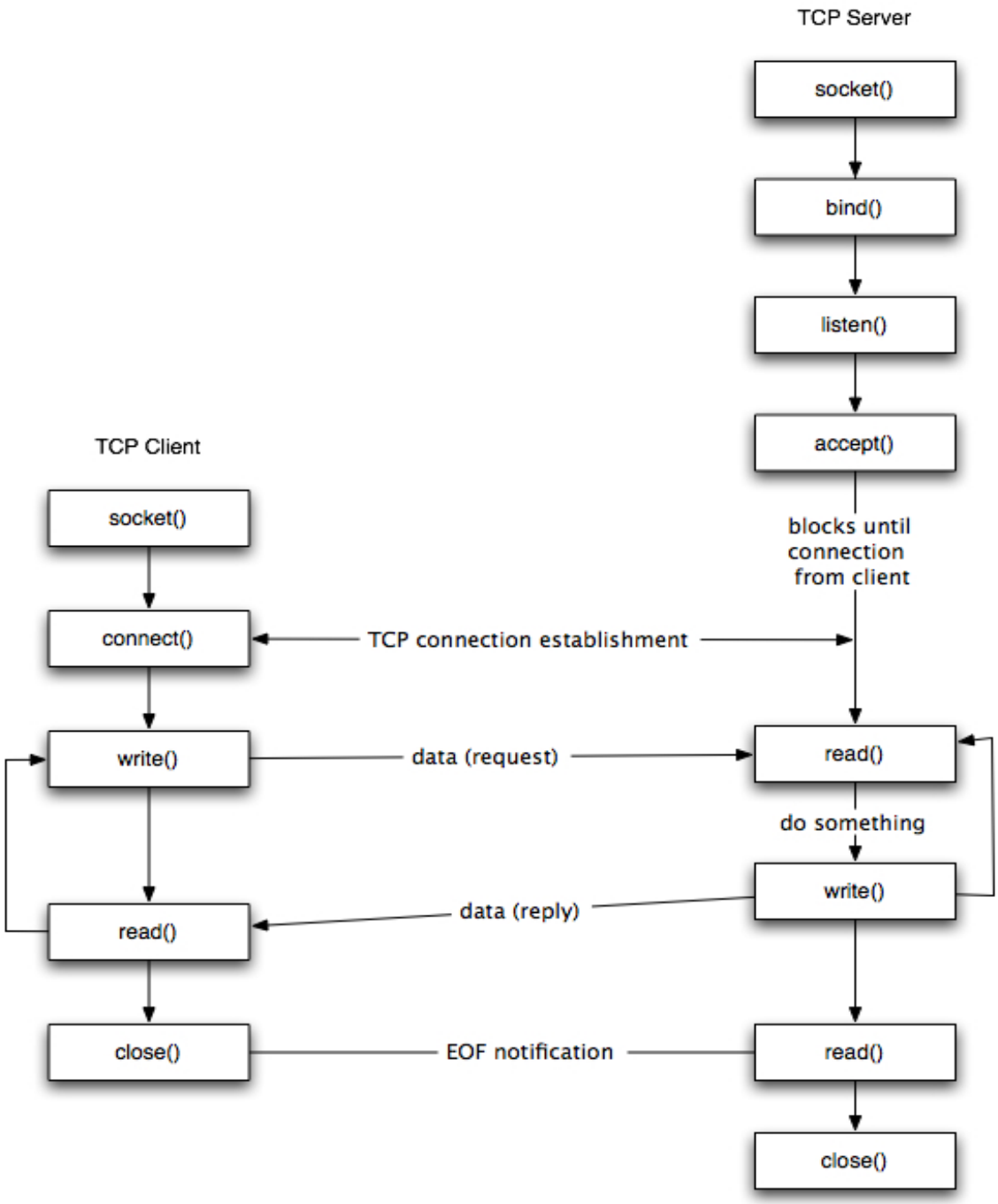
3. Perform I/O or communication with the server:

Receive data from the server: String line = is.readLine();

Send data to the server: os.writeBytes(“Hello\n”);

4. Close the socket when done:

client.close();



Arithmetic:

Arithmetic is a branch of mathematics that consists of the study of numbers, especially the properties of the traditional operations between them—addition, subtraction, multiplication and division. Arithmetic is an elementary part of number theory, and number theory is considered to be one of the top-level divisions of modern mathematics, along with algebra, geometry, and analysis.

Trigonometry:

Trigonometry is a branch of mathematics that studies relationships involving lengths and angles of triangles.

Conclusion :

Thus, after successfully completing this assignment, Students should be able to understand & Implement TCP using Socket programming.