Assignment No 6.

Title: Write a program using TCP socket for wired network for following

a) Say Hello to each other
b) File transfer
c) Calculator (Arithmetic)
d) Calculator (Trigonometry)

Software and Hardware Requirements:

Fedora 20 with Pentium IV and above, 1 GB RAM, 120GB HDD. Monitor, Keyboard, Mouse, Modelio, Eclipse, CDT, Python interpreter Pydev, J2SE, Wireshark Packet Analyzer tool.

Theory:

(a) Say Hello to each other-

The two key classes from the java.net package used in creation of server and client programs are-
E ServerSocket E socket.
A server program creates a specific type of socket that is used to listen for client requests (sever socket)

In the case of a connection request. the program creates a new socket through which it will exchange data with the client using input and output streams.
The socket abstraction is very similar to the file concept, developers have to open a socket, perform I/O and close it

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Steps for creating a server program in JAVA-

(i) Open the server Socket ServerSocket server= new Serversocket()

(ii) Wait for the client request. Socket client - server accept();

(iii) Create I/O streams for communicating to the client DataInput Stream is- new DataInput Stream (client. getInput Stream());

(iv) Perform communication with client receive from client.
String line = is. readLine()
Send to client: os writeBytes("Hello"),.

(v) Close Socket. client. close();

Steps for creating a client program in JAVA

(i) Create a socket object: Socket client = new Socket (server, port id);

(ii) Create I/O streams for communicating with the server is = new Data InputStream (client. getInputStream());

(iii) os = new DataOutput Stream(client. getOutputStream());
Perform I/O communication with the server. Receive the data from the server
String line = is readLine();
Send data to the server.

(iv) Close the socket when done. client. close();

Compile both server and client programs and then deploy server program code on a machine which is going to act as a server and client program on a machine which is going to act as a client.

A TCP client initiates the communication with a server which is waiting for the connection.
TCP is connection oriented and UDP is connectionless, which means the UDP sockets do not need to be connected before being used.

Difference between TCP and UDP is that there is no guarantee that a message sent via UDP socket will arrive at its destination, and messages can be delivered in a different order than they were sent.

A TCP listener is created and starts listening to the specified port.
Again the buffer size is set to 1024 bytes.
A TCP listener can pre check to see if there is any connection pending before calling the accept TCP Client method. It returns true if there are any pending connections.

The client program can run on any computer in the network (LAN, WAN, or Internet) as long as theis is no firewall that blocks communication between them.
The client program is just establishing a connection with the server and waits for the message.
On receiving a response message, it prints the same to the console.
The output in this case is: Hi there which is sent by the server program in response to a client connection request.

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Once the server program is executed started, It is not possible to other server program to run on the same port until the first program which is successful using it is terminated.
Port numbers are mutually exclusive source.

Conclusion:

We successfully implemented a client server program using TCP Socket.