Rupesh Dharme
31124

Assignment 07

Title : Calculator using TCP

Problem statement : Write a TCP socket program for performing operations on calculator. Demonstrate packets captured using wireshark, packet tracer for P2P network.

Prerequisites :
TCP protocol (Transport layer)
python socket programming
wireshark tool

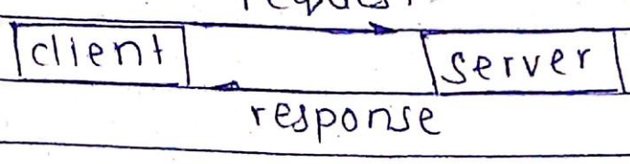
learning objective :
students will be able to :
i. Understand socket programming.
ii. Design networking applications using TCP protocol.

S/W, H/W requirements :
Windows 10, 64 bit (4GB, 512 GB SSD)
python 3.9, VS code editor

Theory :
client server model :
Network applications can be divided in 2 client, server with a communication link joining these 2 bodies.

Teacher's Signature

31124



Normally from client it is one-one connection and server side one-many connections.

The standard model for network applications is client-server model.

A server is a process that is waiting to be contacted by client process to that server can do something for client. Typically BSD sockets application consists of two seperate application level processes. client requests a connection and server accepts it.

client-server using TCP:

TCP client sends request to server and server responds with acknowledgement. Every-time client communicates with server and recieves response from it.

Algorithms:

server:

1. create a TCP socket
2. Bind socket to address and port
3. listen to requests and accept when recieved.
4. process the request equation and send answer
5. If equation == 'quit' end the loop.
6. close server.

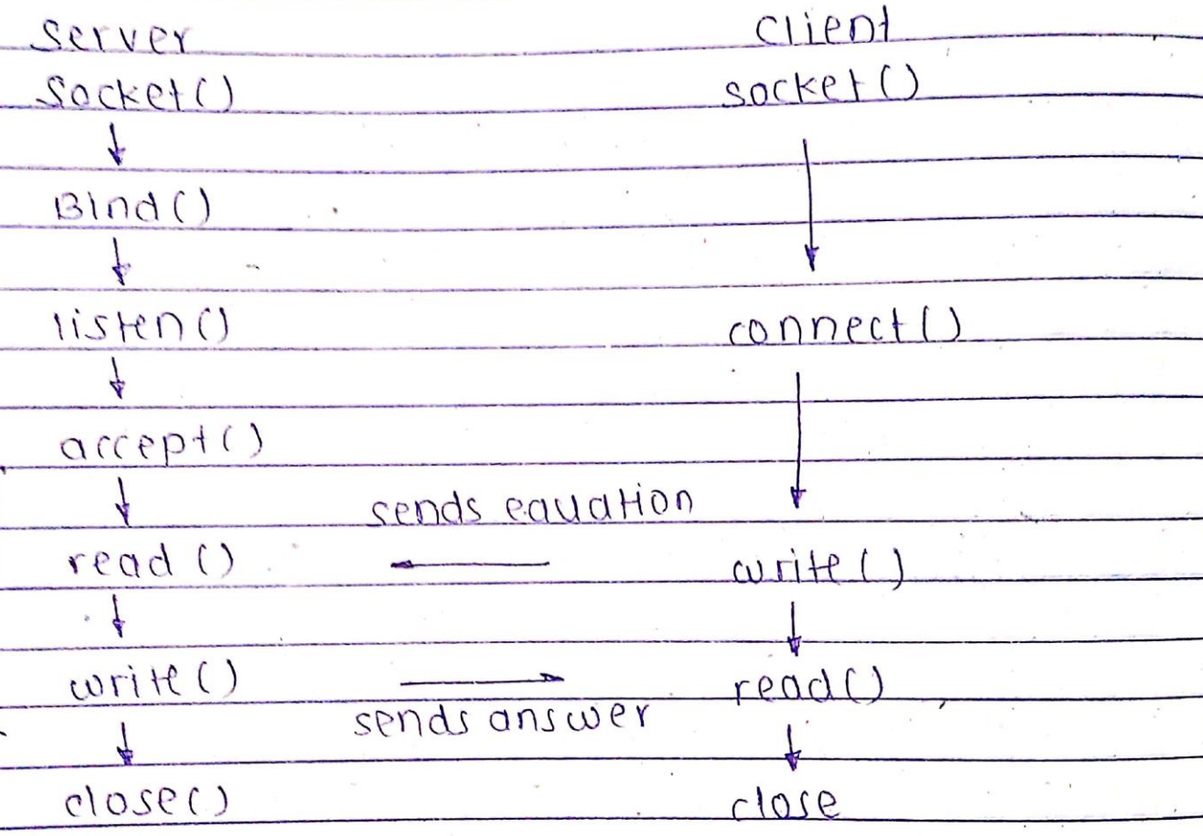
Teacher's Signature

31126

Client:

1. Create a socket
2. connect to server.
3. accept input equation and send to server
4. If input is 'quit' end loop.
5. close connection

Diagram



Conclusion:

A TCP socket was successfully created and a calculator at server was implemented and tested.

Teacher's Signature

powershell

```
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07> python -u "
c:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07\31124_Rupesh_CN
SL_Assignment_07_Server.py"
Server created
Server binded
Server connected to address ('192.168.43.233', 50504)
Calculating...
Answer sent
Calculating...
Answer sent
Calculating...
Answer sent
Thank you!
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07>
```

powershell

```
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07> python -u "
c:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07\31124_Rupesh_CN
SL_Assignment_07_Client.py"
Connection Established
Enter Equation or quit: 5+5*8
ans: 45
Enter Equation or quit: 8/4
ans: 2.0
Enter Equation or quit: 9+9+9+9+9+9+9+9/3
ans: 66.0
Enter Equation or quit: quit
Thank you
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07>
```

powershell

```
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07> python -u "
c:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07\31124_Rupesh_CN
SL_Assignment_07_Server.py"
Server created
Server binded
Server connected to address ('192.168.43.233', 50509)
Calculating...
Answer sent
Calculating...
Answer sent
Calculating...
Answer sent
Thank you!
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07>
```

powershell

```
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07> python -u "
c:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07\31124_Rupesh_CN
SL_Assignment_07_Client.py"
Connection Established
Enter Equation or quit: 5**2+75
ans: 100
Enter Equation or quit: 2**32
ans: 4294967296
Enter Equation or quit: 0.5**100
ans: 7.888609052210118e-31
Enter Equation or quit: quit
Thank you
PS C:\Users\HP\Rupesh\PICT\TE SEM 1\CNS Lab\Assignment 07>
```