Computer Networks Lab 5

Objective:

The aim of this experiment is to establish a connection between client and server on the same machine and also on different machines.

PROBLEM STATEMENT:

In this experiment, One side serves as the server and waits for connections from clients. It is a one-way Client and Server setup where a Client connects, sends messages to the server and the server shows them using a socket connection

ALGORITHM:

Following are steps to be followed for establishing a TCP socket on the client-side:

- *Use the socket() function to create a socket.*
- *Use the connect() function for connecting the socket to the server address.*
- *Use send() function to send the request to the server from the client.*
- *After data transmission completion close the connection using close() function.*

Following are steps to be followed for establishing a TCP socket on the server-side:

- *Use socket() for establishing a socket.*
- *Use the bind() function for binding the socket to an address.*
- *Then for listening client connections use listen() function.*
- *The accept() function is used for accepting the connection of the client.*
- *Send data back to client using send() function.*

- *Close the connection using close().*

The connection is successful

CODE:

CODE FOR LOCALHOST:

SERVER-SIDE:

```
import socket
s = socket.socket()
print('Socket created')
s.bind(("localhost",9999))
s.listen(3)
print('waiting for connections')d
while True:
        c, addr = s.accept()
        name = c.recv(1024).decode()
        print("Connected with ",addr, name)
        c.send(bytes('Welcome','utf-8'))
        c.close()
```

CLIENT-SIDE:

```
import socket
c = socket.socket()
c.connect(("localhost",9999))
```

```
name = input("Enter your name")
c.send(bytes(name,'utf-8'))
print(c.recv(1024))
```

CODE WHEN MY SYSTEM IS CLIENT:

```
import socket
c = socket.socket()
c.connect(("192.168.168.69",9999))
name = input("Enter your name")
c.send(bytes(name,'utf-8'))
print(c.recv(1024))
```

CODE WHEN MY SYSTEM IS SERVER:

```
import socket
s = socket.socket()
print('Socket created')
s.bind(("192.168.168.156",9999))
s.listen(3)
print('waiting for connections')
while True:
        c, addr = s.accept()
        name = c.recv(1024).decode()
        print("Connected with ",addr, name)
```

c.send(bytes('Welcome','utf-8'))

c.close()

OUTPUT:

TEST CASE-1:

```
In [*]: import socket
        s = socket.socket()
        print('Socket created')
        s.bind(('localhost',9999))
        s.listen(3)
        print('waiting for connections')
        while True:
            c, addr = s.accept()
            name = c.recv(1024).decode()
            print("Connected with ",addr, name)
            c.send(bytes('Welcome','utf-8'))
            c.close()

Socket created
waiting for connections
Connected with  ('127.0.0.1', 61204) Lohith
```

```
In [1]: import socket
        c = socket.socket()
        c.connect(("localhost",9999))
        name = input("Enter your name")
        c.send(bytes(name,'utf-8'))
        print(c.recv(1024))

Enter your nameLohith
b'Welcome'
```

EXPLANATION:

In this test case, the client and server are on the same machine, so it has the same IP address which is localhost and the port number I have given is 9999. Port numbers can range from 0 to 65535.

Here we are only allowing 3 connections. The client will send a request to the server and the server will accept it so that the connection gets established.

TEST CASE-2:

```
In [*]: import socket
        s = socket.socket()
        print('Socket created')
        s.bind(('192.168.168.69',9999))
        s.listen(3)
        print('waiting for connections')
        while True:
            c, addr = s.accept()
            name = c.recv(1024).decode()
            print("Connected with ",addr, name)
            c.send(bytes('Welcome','utf-8'))
            c.close()

        Socket created
        waiting for connections
        Connected with  ('192.168.168.156', 52779) Manisha
```

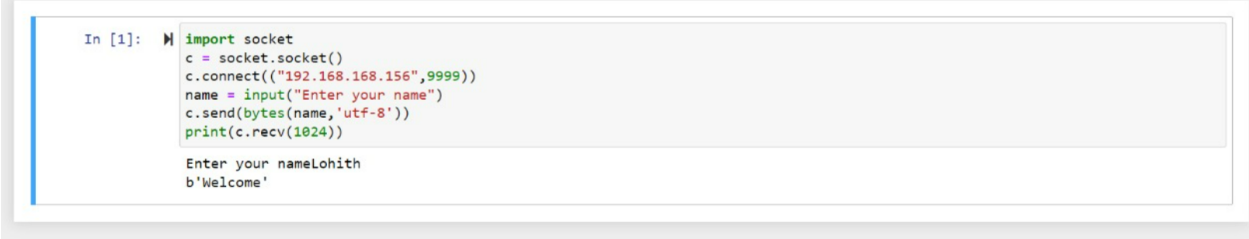
```
In [1]: import socket
        c = socket.socket()
        c.connect(("192.168.168.69",9999))
        name = input("Enter your name")
        c.send(bytes(name,'utf-8'))
        print(c.recv(1024))

        Enter your nameManisha
        b'Welcome'
```

EXPLANATION:

Here the client is Lohith and the server is Manisha. The client sends a request to the server with the help of the IP address(192.168.168.69) and Port number(9999) of the server. Now, the server accepts the request and gets connected with the client. A welcome message is displayed on the client side and the connected message is displayed on the server side.

TEST CASE-3:



```
In [1]: import socket
c = socket.socket()
c.connect(("192.168.168.156",9999))
name = input("Enter your name")
c.send(bytes(name,'utf-8'))
print(c.recv(1024))

Enter your nameLohith
b'Welcome'
```

```
In [*]: import socket
s = socket.socket()
print('Socket created')
s.bind(("192.168.168.156",9999))
s.listen(3)
print('waiting for connections')
while True:
    c, addr = s.accept()
    name = c.recv(1024).decode()
    print("Connected with ",addr, name)
    c.send(bytes('Welcome','utf-8'))
    c.close()

Socket created
waiting for connections
Connected with  ('192.168.168.69', 59041) Lohith
```

EXPLANATION:

Here, the client is me and the server is Manisha. I send a request to the server with IP address 192.168.168.156 and port number 9999. The server accepts my request if there are less than 3 connections and after the server accepts my request “Welcome” message is displayed on my screen.

PROBLEMS FACED:

I initially faced a problem accepting requests from clients as I do not know that the firewall should be turned off on the server side.

CONCLUSION:

With the help of this experiment, I am able to establish a connection between client and server on the same machine and also on different machines.