Name: Prachi Mehta
UID: 2018130025
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Lab 8: Socket Programming

Aim: To implement Client Server program.

Theory:

Socket Programming:

Socket programming is a way of connecting two nodes on a network to communicate with each other. One socket (node) listens on a particular port at an IP, while other socket reaches out to the other to form a connection. Server forms the listener socket while client reaches out to the server.
They are the real backbones behind web browsing. In simpler terms there is a server and a client.
Socket programming is started by importing the socket library and making a simple socket.

Server Socket Methods:

Sr.No.	Method & Description
1	**s.bind()** This method binds address (hostname, port number pair) to socket.
2	**s.listen()** This method sets up and start TCP listener.
3	**s.accept()** This passively accept TCP client connection, waiting until connection arrives (blocking).

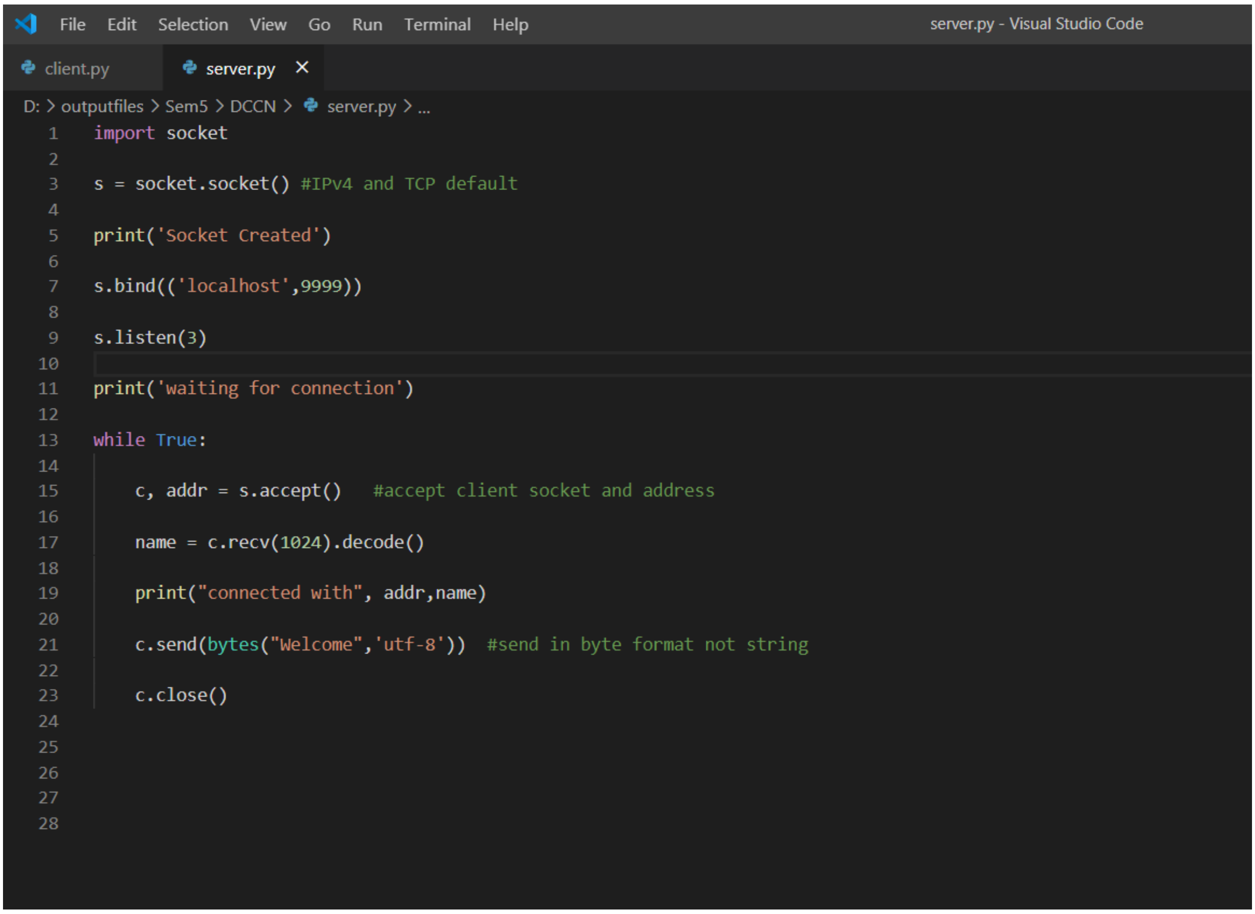
Client Socket Methods:

Sr.No.	Method & Description
1	**s.connect()** This method actively initiates TCP server connection.

General Socket Methods:

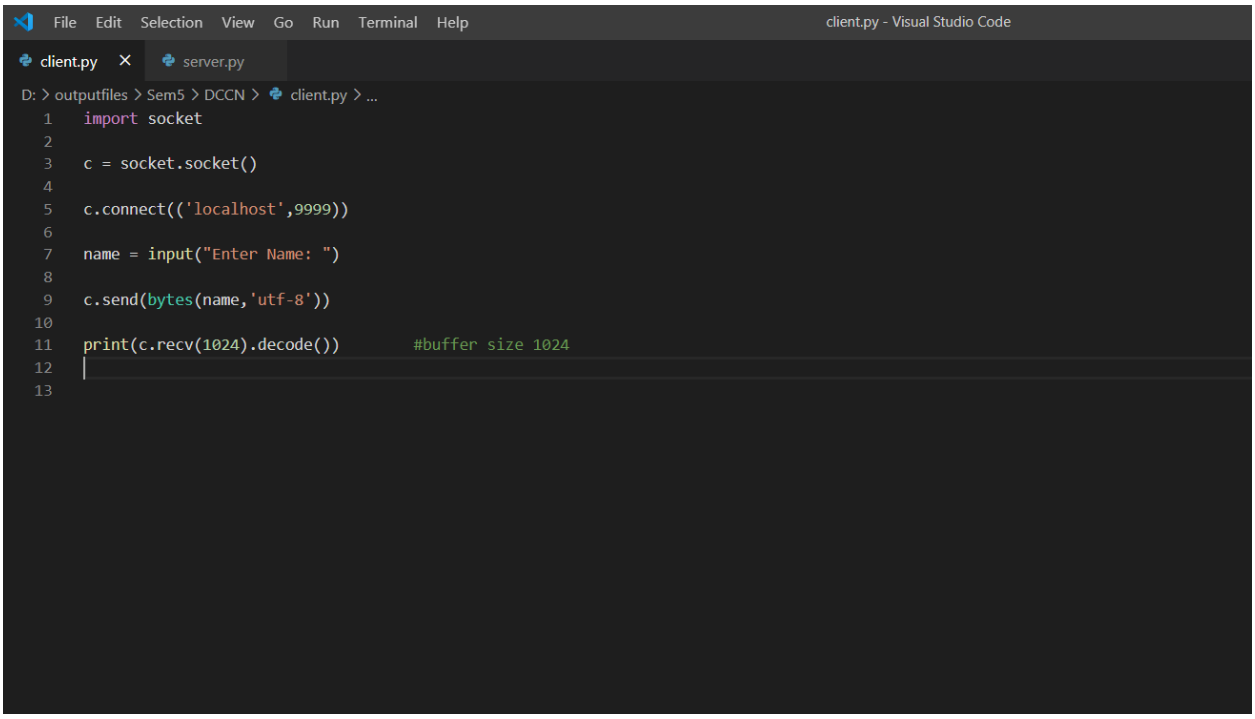
Sr.No.	Method & Description
1	**s.recv()** This method receives TCP message
2	**s.send()** This method transmits TCP message
3	**s.recvfrom()** This method receives UDP message
4	**s.sendto()** This method transmits UDP message
5	**s.close()** This method closes socket
6	**socket.gethostname()** Returns the hostname.

Server:


File Edit Selection View Go Run Terminal Help
server.py - Visual Studio Code
client.py
server.py
D: > outputfiles > Sem5 > DCCN > server.py > ...

```python
import socket

s = socket.socket() #IPv4 and TCP default

print('Socket Created')

s.bind(('localhost',9999))

s.listen(3)

print('waiting for connection')

while True:

    c, addr = s.accept()   #accept client socket and address

    name = c.recv(1024).decode()

    print("connected with", addr,name)

    c.send(bytes("Welcome",'utf-8'))  #send in byte format not string

    c.close()
```

Client:


File Edit Selection View Go Run Terminal Help
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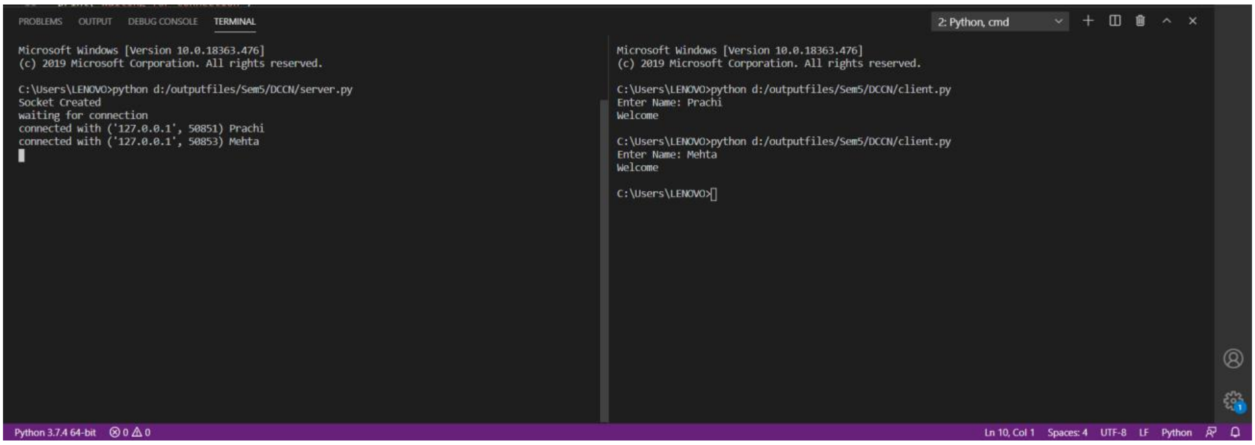
client.py
server.py
D: > outputfiles > Sem5 > DCCN > client.py > ...

```python
import socket

c = socket.socket()

c.connect(('localhost',9999))

name = input("Enter Name: ")

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

print(c.recv(1024).decode())        #buffer size 1024

```

Output:



```
Microsoft Windows [Version 10.0.18363.476]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\LENOVO>python d:/outputfiles/Sem5/DCCN/server.py
Socket Created
waiting for connection
connected with ('127.0.0.1', 50851) Prachi
connected with ('127.0.0.1', 50853) Mehta
```

```
Microsoft Windows [Version 10.0.18363.476]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\LENOVO>python d:/outputfiles/Sem5/DCCN/client.py
Enter Name: Prachi
Welcome

C:\Users\LENOVO>python d:/outputfiles/Sem5/DCCN/client.py
Enter Name: Mehta
Welcome

C:\Users\LENOVO>
```

Conclusion: After completing this experiment I understood concept of socket programming.

Reference:

1. https://www.tutorialspoint.com/python/python_networking.html