Experiment 8

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AIM – To establish connection between server client using sockets.

THEORY –

What is sockets ?

Sockets are the endpoints of a bidirectional communications channel. Sockets may communicate within a process, between processes on the same machine, or between processes on different continents.

Sockets may be implemented over a number of different channel types: Unix domain sockets, TCP, UDP, and so on. The *socket* library provides specific classes for handling the common transports as well as a generic interface for handling the rest.[1]

What is 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 form the backbones of web browsing.[2]
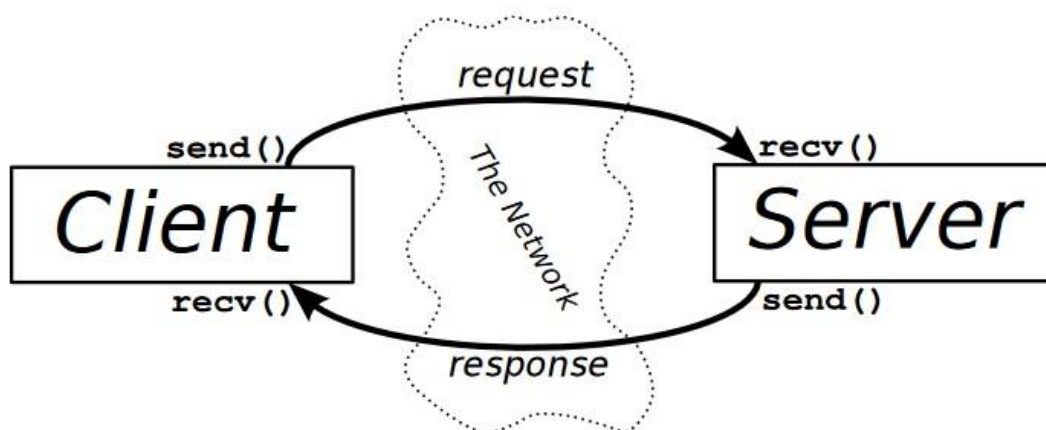

Figure 2: Client-Server Interaction.

The exchange of information between client and server is summarized in the above diagram.

A server has a bind() method which binds it to a specific ip and port so that it can listen to incoming requests on that ip and port. A server has a listen() method which puts the server into listen mode. This allows the server to listen to incoming connections. And last a server has an accept() and close() method. The accept method initiates a connection with the client and the close method closes the connection with the client.[2]

CODE –

Server:

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server.py   ×   client.py   ×

```python
import socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.bind((socket.gethostname(), 8000))
s.listen(5)
while True:
    clientsocket, address = s.accept()
    print(f'Connection is established with {address}')
    mesg = f'Hello! You are connected to {address}'
    clientsocket.send(bytes(mesg, 'utf-8'))
    clientsocket.close()
```

Client:

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server.py   ×   client.py   ×

```python
import socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.connect((socket.gethostname(), 8000))
msg = s.recv(1024)
print(msg.decode('utf-8'))
```

OUTPUT –

Server:


```
C:\WINDOWS\system32\cmd.exe - python server.py

Microsoft Windows [Version 10.0.18363.1139]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Khushi>cd C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>python server.py
Connection is established with ('192.168.1.6', 57662)
Connection is established with ('192.168.1.6', 57663)
Connection is established with ('192.168.1.6', 57664)
Connection is established with ('192.168.1.6', 57665)
```

Client:


```
C:\WINDOWS\system32\cmd.exe

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>python client.py
Hello! You are connected to ('192.168.1.6', 57662)

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>python client.py
Hello! You are connected to ('192.168.1.6', 57663)

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>python client.py
Hello! You are connected to ('192.168.1.6', 57664)

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>python client.py
Hello! You are connected to ('192.168.1.6', 57665)

C:\Users\Khushi\Desktop\Sem 5\DCCN\Final Submissions\exp8>
```

CONCLUSION –

I understood the basics of socket programming and established a simple connection between client and server using the same.

REFERENCES –

[1] https://www.tutorialspoint.com/python/python_networking.htm

[2] https://www.geeksforgeeks.org/socket-programming-python/