Data Communication and Networks Lab

Experiment 8

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Lab 7: Socket Programming

Theory :

A *socket* is a communications connection point (endpoint) that you can name and address in a network. Socket programming shows how to use socket APIs to establish communication links between remote and local processes.
The processes that use a socket can reside on the same system or different systems on different networks. Sockets are useful for both stand-alone and network applications. Sockets allow you to exchange information between processes on the same machine or across a network, distribute work to the most efficient machine, and they easily allow access to centralized data. Socket application program interfaces (APIs) are the network standard for TCP/IP. A wide range of operating systems support socket APIs. i5/OS™ sockets support multiple transport and networking protocols. Socket system functions and the socket network functions are thread safe.

Code :

server.py

```
import socket

# creation of socket object
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
print("Socket successfully created")

# reserving a port on the computer
port = 12345
```

```
# binding ip address and port
# empty string means server will listen to requests coming from other computer
# s on the network
s.bind(('', port))
print("socket binded to %s" %(port) )

# puting the socket into listening mode
s.listen(5)
print("socket is listening")

while True:

 # Establishing a connection with client.
 c, addr = s.accept()
 print('Got connection from', addr )

 # sending a thank you message to the client.
 c.send(b'Thank you for connecting')

 # Close the connection with the client
 c.close()
```

client.py

```
import socket

# Creating a socket object
s = socket.socket()

# Defining the port on which we want to connect
port = 12345

# connecting to the server on local computer
s.connect(('127.0.0.1', port))

# receiving data from the server
print(s.recv(1024) )
# closing the connection
s.close()
```

Output :

```
PS C:\Users\ojasa\Documents\engineering\TE\DCCN\Lab> python server.py
Socket successfully created
socket binded to 12345
socket is listening
Got connection from ('127.0.0.1', 54927)
```

```
PS C:\Users\ojasa\Documents\engineering\TE\DCCN\Lab> python client.py
b'Thank you for connecting'
PS C:\Users\ojasa\Documents\engineering\TE\DCCN\Lab>
```

Conclusion :

I was able to understand the basics of socket programming. I have been able to establish a communication between a client and server.

Reference :

- https://www.ibm.com/support/knowledgecenter/en/ssw_ibm_i_71/rzab6/rzab6soxoverview.htm
- https://www.geeksforgeeks.org/socket-programming-python/#:~:text=Socket%20programming%20is%20a%20way,reaches%20out%20to%20the%20server.