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CEL 51, DCCN, 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.

Code:

Server.py

```python
import socket

s = socket.socket()

print('Socket Created')

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

s.listen(3)

print('waiting for connection')

while True:

    c, addr = s.accept()
```

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

    print("connected with", addr,name)

    c.send(bytes("Welcome "+ name,'utf-8'))
```

client.py

```
import socket

c = socket.socket()

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

name = input("Enter Your Name: ")

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

print(c.recv(1024).decode())
```

output:

server.py

```
C:\Users\Raj\Desktop>python server.py
Socket Created
waiting for connection
connected with ('127.0.0.1', 61669) Raj
connected with ('127.0.0.1', 61673) GET / HTTP/1.1
Host: localhost:9999
Connection: keep-alive
Cache-Control: max-age=0
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.3
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/av
Sec-Fetch-Site: none
Sec-Fetch-Mode: navigate
Sec-Fetch-User: ?1
Sec-Fetch-Dest: document
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
```

Client.py

```
C:\Users\Raj\Desktop>python client.py
Enter Your Name: Raj
Welcome Raj
```

Conclusion:

After completing this experiment, I understood concept of socket programming.

Reference:

https://www.tutorialspoint.com/python/python_networking.htm