

## Weekly Assignment-8

Thanvi Katakam(2023006366)

### ***Title: Introduction to Socket Programming***

#### ***Aim:***

*To create a server that listens to port 5003 using stream sockets and a client that connects to the server. The client sends a simple text message "Hello" to the server, and the server responds with the same message before closing the connection.*

#### ***Description:***

*Socket programming provides an interface for interprocess communication between two processes that may be running on the same machine or on different machines within a network using the TCP/IP protocol. Sockets were introduced in the Berkeley Software Distribution (BSD) version of Unix and are categorized into client and server sockets. Each socket is associated with a socket descriptor.*

*In Python, a socket is created using the socket module as follows:*

*Where:*

- *AF\_INET represents an IPv4 address family.*

- *SOCK\_STREAM* represents a TCP connection (stream-based socket).

*A server follows these steps:*

1. *Create a socket.*
2. *Bind it to an address and port.*
3. *Listen for incoming connections.*
4. *Accept a connection.*
5. *Receive and send data.*
6. *Close the socket.*

*A client follows these steps:*

1. *Create a socket.*
2. *Connect to the server.*
3. *Send and receive data.*
4. *Close the socket.*

***Procedure:***

## Client output:

```
Command Prompt
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Users\THANVI>cd %USERPROFILE%\Downloads

C:\Users\THANVI\Downloads>netepad server.py
'netepad' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\THANVI\Downloads>notepad client.py

C:\Users\THANVI\Downloads>python client.py
Connected to the server.
Server says: Hello from Server
Connection closed.

C:\Users\THANVI\Downloads>
```

## Server output:

```
Command Prompt
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Users\THANVI>cd %USERPROFILE%\Downloads

C:\Users\THANVI\Downloads>notepad server.py

C:\Users\THANVI\Downloads>python server.py
Server is listening on port 5003...
Connection established with ('127.0.0.1', 53371)
Client: Hello

C:\Users\THANVI\Downloads>
```

## Server code :

```
File Edit View
import socket

# Create a socket
server_socket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

# Bind the socket to localhost and port 5003
server_socket.bind(("localhost", 5003))

# Listen for incoming connections
server_socket.listen(1)
print("Server is listening on port 5003...")

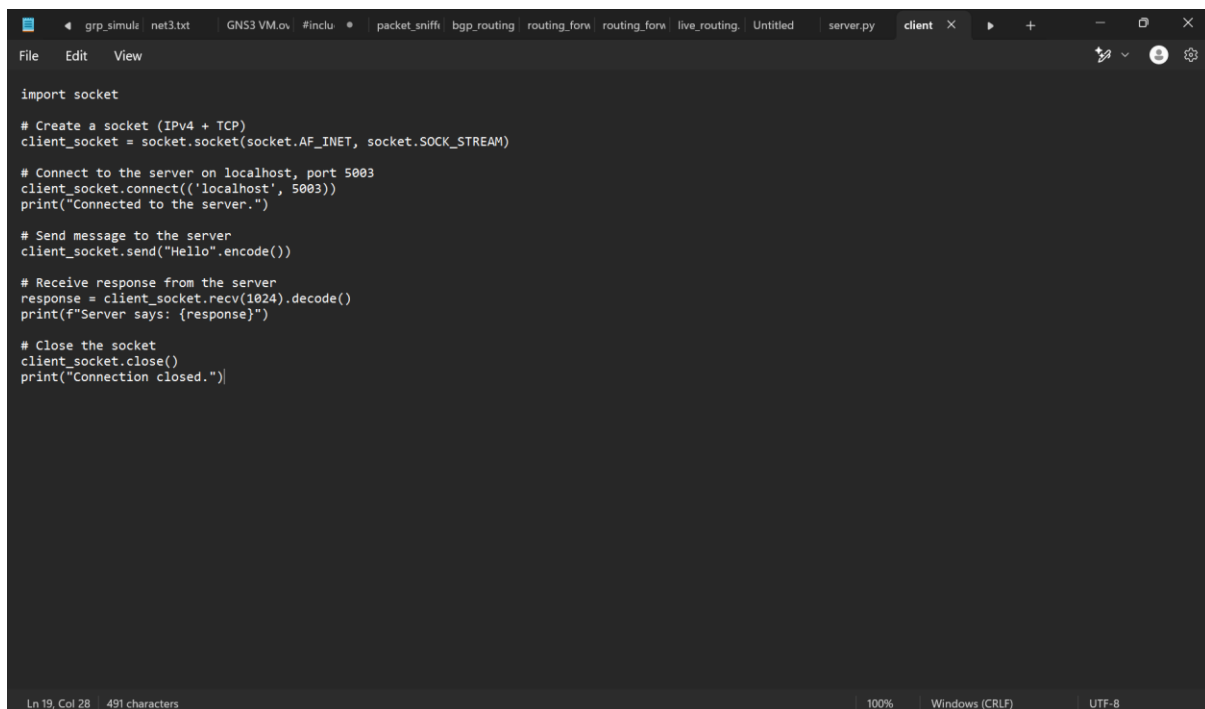
# Accept a client connection
client_socket, addr = server_socket.accept()
print(f"Connection established with {addr}")

# Receive message from client
client_message = client_socket.recv(1024).decode()
print(f"Client: {client_message}")

# Send response to client
server_message = "Hello from Server"
client_socket.send(server_message.encode())

# Close the connection
client_socket.close()
server_socket.close()
```

## ***Client code:***



```
import socket

# Create a socket (IPv4 + TCP)
client_socket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

# Connect to the server on localhost, port 5003
client_socket.connect(('localhost', 5003))
print("Connected to the server.")

# Send message to the server
client_socket.send("Hello".encode())

# Receive response from the server
response = client_socket.recv(1024).decode()
print(f"Server says: {response}")

# Close the socket
client_socket.close()
print("Connection closed.")
```

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## ***Conclusion:***

***The server successfully listened on port 5003, accepted a connection from the client, received the "Hello" message, and responded back with the same message. The connection was then closed successfully, demonstrating basic socket communication in Python.***