Program 1 :

Using TCP Socket

Program (Server):

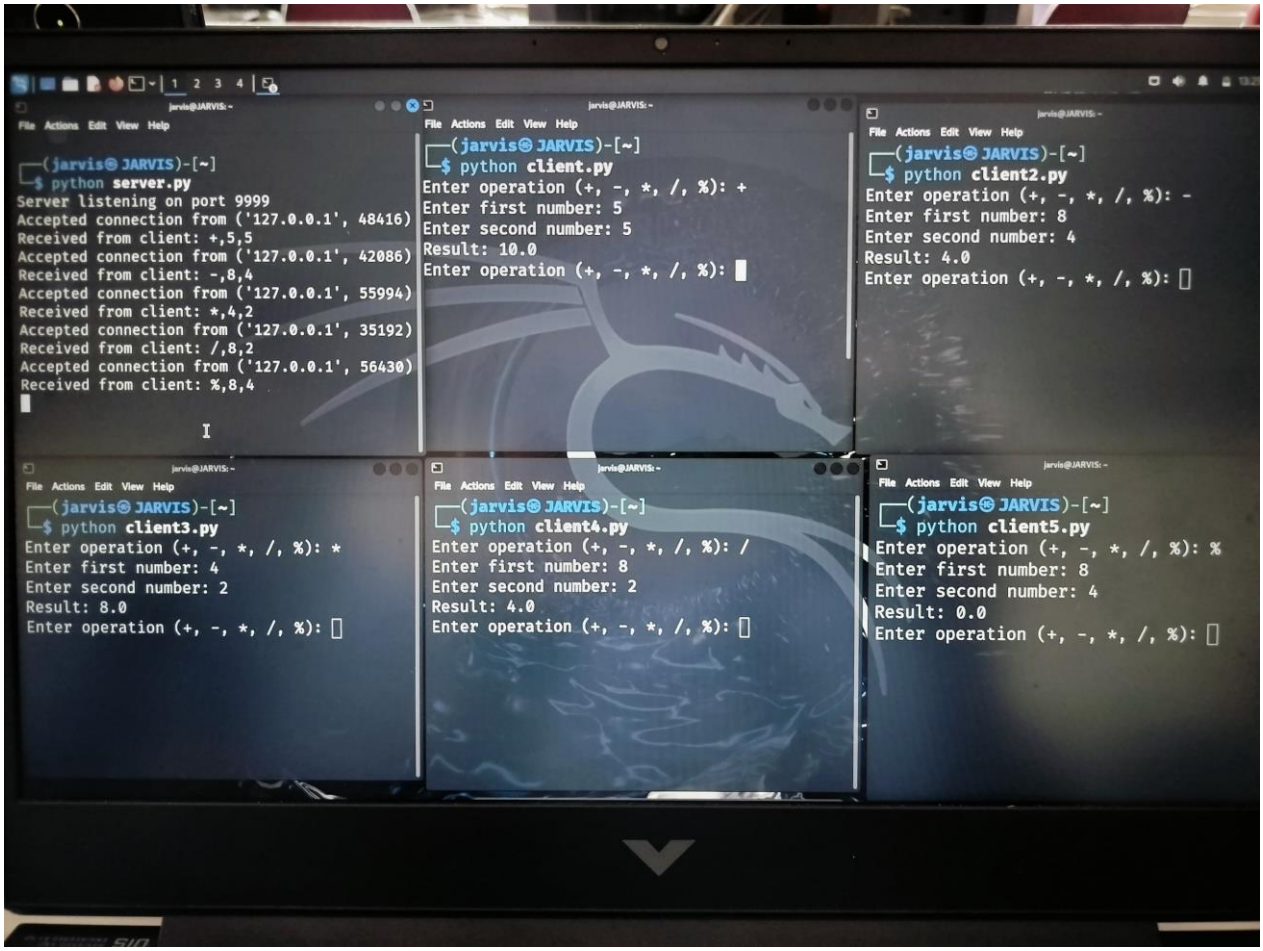
```
import socket
import threading

def handle_client(client_socket):
    while True:
        try:
            # Receive the operation and numbers from the client
            data = client_socket.recv(1024).decode('utf-8')
            if not data:
                break

            print(f"Received from client: {data}")

            # Extract operation and numbers
            operation, num1, num2 = data.split(',')
            num1 = float(num1)
            num2 = float(num2)

            # Perform the operation
            if operation == '+':
                result = num1 + num2
            elif operation == '-':
                result = num1 - num2
            elif operation == '*':
                result = num1 * num2
            elif operation == '/':
                if num2 != 0:
                    result = num1 / num2
                else:
                    result = "Error: Division by zero"
            elif operation == '%':
                result = num1 % num2
            else:
                result = "Error: Invalid operation"

            # Send result back to client
```

```
            client_socket.send(str(result).encode('utf-8'))

        except Exception as e:
            print(f"Error: {e}")
            break

    client_socket.close()

def start_tcp_server():
    server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    server.bind(('127.0.0.1', 9999))
    server.listen(5)
    print("Server listening on port 9999")

    while True:
        client_socket, addr = server.accept()
        print(f"Accepted connection from {addr}")
        client_handler = threading.Thread(target=handle_client, args=(client_socket,))
        client_handler.start()

if __name__ == "__main__":
    start_tcp_server()
```

Program (Client):

```
import socket

def start_tcp_client():
    client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    client.connect(('127.0.0.1', 9999))  # Change IP to server's IP address

    while True:
        try:
            # Input operation and numbers
            operation = input("Enter operation (+, -, *, / ,%): ")
            num1 = input("Enter first number: ")
            num2 = input("Enter second number: ")

            # Send operation and numbers to the server
            client.send(f"{operation},{num1},{num2}".encode('utf-8'))

            # Receive the result from the server
            result = client.recv(1024).decode('utf-8')
            print(f"Result: {result}")

        except KeyboardInterrupt:
            print("Client disconnected")
            break

    client.close()

if __name__ == "__main__":
    start_tcp_client()
```

Output :


jarvis@JARVIS: ~
File Actions Edit View Help
(jarvis㉿JARVIS)-[~]
$ python server.py
Server listening on port 9999
Accepted connection from ('127.0.0.1', 48416)
Received from client: +,5,5
Accepted connection from ('127.0.0.1', 42086)
Received from client: -,8,4
Accepted connection from ('127.0.0.1', 55994)
Received from client: *,4,2
Accepted connection from ('127.0.0.1', 35192)
Received from client: /,8,2
Accepted connection from ('127.0.0.1', 56430)
Received from client: %,8,4
(jarvis㉿JARVIS)-[~]
$ python client.py
Enter operation (+, -, *, /, %): +
Enter first number: 5
Enter second number: 5
Result: 10.0
Enter operation (+, -, *, /, %):
(jarvis㉿JARVIS)-[~]
$ python client2.py
Enter operation (+, -, *, /, %): -
Enter first number: 8
Enter second number: 4
Result: 4.0
Enter operation (+, -, *, /, %):
(jarvis㉿JARVIS)-[~]
$ python client3.py
Enter operation (+, -, *, /, %): *
Enter first number: 4
Enter second number: 2
Result: 8.0
Enter operation (+, -, *, /, %):
(jarvis㉿JARVIS)-[~]
$ python client4.py
Enter operation (+, -, *, /, %): /
Enter first number: 8
Enter second number: 2
Result: 4.0
Enter operation (+, -, *, /, %):
(jarvis㉿JARVIS)-[~]
$ python client5.py
Enter operation (+, -, *, /, %): %
Enter first number: 8
Enter second number: 4
Result: 0.0
Enter operation (+, -, *, /, %):