C.N. Lab Mini Project
Group 1

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Problem Statement: -

Write a socket program both for client and server. The server will be
able to send the pattern of 0's and 1's only. The client will count the
number of 0's and 1's send by the server.

Team (Group-1): -
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Language Chosen - Python

```python
import socket

HOST = socket.gethostbyname(socket.gethostname())
PORT = 9999

server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
server.bind(('localhost', PORT))

server.listen()
print(f"SERVER LISTENING ON {HOST}, {PORT}")

while(True):
    client_conn, addr = server.accept()
    print(f"\n[CONNECTED TO CLIENT] : {addr}")

    while True:
        msg = input("\n-> ")
        n = len(msg)
        count = 0
        # check if only 0s and 1s are given in the input
        while count < n:
            l = msg[count]
            if (l!='0' and l!='1'):
                print("!!!Invalid Input...Enter ONLY 0's and 1's : ")
                # repeat
                msg = input("\n-> ")
                n = len(msg)
                count = 0
                continue
            count+=1

        client_conn.send(msg.encode('utf-8'))

        count0, count1 = [int(i) for i in client_conn.recv(2048).decode('utf-8').split('\n')]
```

```python
if (count0, count1):
    print("\nclient : ")
    print(f"Count of 0's : {count0}")
    print(f"Count of 1's : {count1}")
else:
    print(f"\n[CLIENT {addr} DISCONNECTED!]")
    client_conn.close()
```

#CLIENT.PY

```python
import socket

HOST = 'localhost'
PORT = 9999

client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
client.connect((HOST, PORT))

def count01(msg):
    count_0 = 0
    count_1 = 0

    for letter in msg:
        if(letter == '0'):
            count_0 += 1
        if(letter == '1'):
            count_1 += 1

    print(f"Count of 0's : {count_0}")
    print(f"Count of 1's : {count_1}")

    client.sendall(str.encode("\n".join([str(count_0), str(count_1)])))

while True:
    msg = client.recv(1024).decode('utf-8')

    if msg:
        print(f"\nserver : {msg}")
        count01(msg)
    else:
        print(f"\n[SERVER DISCONNECTED!]")
        client.close()
```

```
python -u "/home/abdulbasit/Desktop/CN_LAB/Lab_project_count_1s_N_0s/server.py"
abdulbasit@abdulbasit-asus-tuf-gaming-a15:~/Desktop/CN_LAB/Lab_project_count_1s_N_
0s$ python -u "/home/abdulbasit/Desktop/CN_LAB/Lab_project_count_1s_N_0s/server.py
"
SERVER LISTENING ON 192.168.1.4, 9999

[CONNECTED TO CLIENT] : ('127.0.0.1', 52978)

-> 11000

client :
Count of 0's : 3
Count of 1's : 2

-> 101010

client :
Count of 0's : 3
Count of 1's : 3

-> 0001

client :
Count of 0's : 3
Count of 1's : 1

-> 1111

client :
Count of 0's : 0
Count of 1's : 4

-> 0

client :
Count of 0's : 1
Count of 1's : 0

->
```

```
abdulbasit@abdulbasit-asus-tuf-gaming-a15:~/Desktop/CN_LAB/Lab_projec
t_count_1s_N_0s$ python client.py

server : 11000
Count of 0's : 3
Count of 1's : 2

server : 101010
Count of 0's : 3
Count of 1's : 3

server : 0001
Count of 0's : 3
Count of 1's : 1

server : 1111
Count of 0's : 0
Count of 1's : 4

server : 0
Count of 0's : 1
Count of 1's : 0
```

```
python -u "/home/abdulbasit/Desktop/CN_LAB/Lab_project_count_1s_N_0s/server.py"
abdulbasit@abdulbasit-asus-tuf-gaming-a15:~/Desktop/CN_LAB/Lab_project_count_1s_N_
0s$ python -u "/home/abdulbasit/Desktop/CN_LAB/Lab_project_count_1s_N_0s/server.py
"
SERVER LISTENING ON 192.168.1.4, 9999

[CONNECTED TO CLIENT] : ('127.0.0.1', 52980)

-> 0023001
!!!Invalid Input...Enter ONLY 0's and 1's :

-> 11000

client :
Count of 0's : 3
Count of 1's : 2

-> 234
!!!Invalid Input...Enter ONLY 0's and 1's :

-> 000001

client :
Count of 0's : 5
Count of 1's : 1

-> 0101052
!!!Invalid Input...Enter ONLY 0's and 1's :

-> 0110001101

client :
Count of 0's : 5
Count of 1's : 5

-> █
```

```
abdulbasit@abdulbasit-asus-tuf-gaming-a15:~/Desktop/CN_LAB/Lab_project_count_1s_N
_0s$ python client.py

server : 11000
Count of 0's : 3
Count of 1's : 2

server : 000001
Count of 0's : 5
Count of 1's : 1

server : 0110001101
Count of 0's : 5
Count of 1's : 5
▯
```