# Computer Networks


## B. Uday Kiran

## CS21B1058


1) Creation of Socket
    a. Socket programming is a way for computers to communicate with each other over a network.
    b. It allows programs to send and receive data between a client and a server.
    c. To create a socket using python, we need to include a library called ‘socket’ and using a inbuilt function in that library ( socket.socket(socket.AF_INET, socket.SOCK_STREAM) ) we can create a socket. Here AF_INET means socket will use IPv4 and SOCK_STREAM means it uses TCP.

**Server**:

```
import socket

PORT = 12356

ADDRESS = socket.gethostbyname(socket.gethostname())

FORMAT = 'utf-8'

print(ADDRESS)

socket = socket.socket(socket.AF_INET , socket.SOCK_STREAM)

socket.bind((ADDRESS, PORT))

socket.listen(2)

while True:

new_conn, addr = socket.accept()

print(f"[NEW CONNECTION] {addr}")

new_conn.send('[SUCCESSFULLY CONNECTED]'.encode(FORMAT))

new_conn.close()

break
```

2) Connecting to Any Server Using Socket
    a. The purpose of connecting to any server is exchange of data.
    b. To connect to any server, first a socket need to be created using socket library in python. After that, client needs to specify the IP address and port number in order to connect to that specific sever.
    c. After mentioning the IP Address and port number, client needs to send connection request to the server.

```
import socket

PORT = 5000

ADDRESS = '192.168.137.59'

FORMAT = 'utf-8'

socket = socket.socket()

socket.connect((ADDRESS, PORT))

print(socket.recv(2024).decode(FORMAT))

socket.close()
```

3) Changing the port number
    a. Ports allow multiple applications to communicate with the same computer.
    b. Every application which is in running status, uses a port.
    c. If we try to change the port number, sometimes the port may be busy due to another process using that port.
    d. That port can be used after the process that is running on that port completes/fails.

4) Connecting one computer to another
    a. Using socket programming, we can easily connect 2 computers, using client and server architecture.
    b. In one computer, the server must be running.
    c. In another computer, the client must try to use the server's IP address and port number, and request a connection to the server.
    d. Once the connection is established, you can start sending andreceiving data.

server.py > ...

```python

PORT = 12356
ADDRESS = socket.gethostbyname(socket.gethostname())
FORMAT = 'utf-8'

print(ADDRESS)

socket = socket.socket(socket.AF_INET , socket.SOCK_STREAM)
socket.bind((ADDRESS, PORT))
socket.listen(2)

while True:
    new_conn, addr  = socket.accept()
    print(f"[NEW CONNECTION] {addr}")
    new_conn.send('[SUCCESSFULLY CONNECTED]'.encode(FORMAT))
    new_conn.close()
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\B Uday Kiran\CN> python -u "c:\Users\B Uday Kiran\CN\server.py"
172.16.19.122
[NEW CONNECTION] ('172.16.18.70', 62494)
PS C:\Users\B Uday Kiran\CN> python -u "c:\Users\B Uday Kiran\CN\server.py"
172.16.19.122
[NEW CONNECTION] ('172.16.18.70', 62876)
PS C:\Users\B Uday Kiran\CN>
```


```
PS C:\Users\B Uday Kiran\CN> python -u "c:\Users\B Uday Kiran\CN\server.py"
172.16.19.122
[NEW CONNECTION] ('172.16.18.70', 62876)
PS C:\Users\B Uday Kiran\CN>
```


ubantu1 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Aug 2 17:51

abhinandan@abhinandan-VirtualBox: ~

```
abhinandan@abhinandan-VirtualBox:~$ gedit client.py &
[1] 7924
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
^CTraceback (most recent call last):
  File "/home/abhinandan/client.py", line 6, in <module>
    client_socket.connect((server_ip, server_port))
KeyboardInterrupt
[1]+  Done                    gedit client.py

abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Connected to the server at 127.0.0.1:12345
Received from server: Welcome to the server!
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Connected to the server at 127.0.0.1:12356
Received from server: Welcome to the server!
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Connected to the server at 127.0.0.1:12356
Received from server: Welcome to the server!
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Traceback (most recent call last):
  File "/home/abhinandan/client.py", line 6, in <module>
    client_socket.connect((server_ip, server_port))
ConnectionRefusedError: [Errno 111] Connection refused
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Traceback (most recent call last):
  File "/home/abhinandan/client.py", line 6, in <module>
    client_socket.connect((server_ip, server_port))
ConnectionRefusedError: [Errno 111] Connection refused
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Connected to the server at 172.16.19.122:12356
Received from server: [SUCCESSFULLY CONNECTED]
abhinandan@abhinandan-VirtualBox:~$ python3 client.py
Connected to the server at 172.16.19.122:12356
Received from server: [SUCCESSFULLY CONNECTED]
abhinandan@abhinandan-VirtualBox:~$
```

Your work Assigned

+ Add or create

Mark as done

31°C Mostly cloudy

Search