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**Network and Communication Lab (CSE-1004)**

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**Digital Assignment-02**

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### **Question 1:**

**Q1. Write TCP Socket program to transfer the contents of a file from the client program by reading from an existing file and write the contents to a new file in the server program.**

### **Code:**

Server Code:

```
import socket
port = 60005
s = socket.socket()
host = socket.gethostname()
s.bind((host, port))
s.listen(5)
print ('Server listening....')
while True:
    conn, addr = s.accept()
    print ('Got connection from', conn,addr)
    data = conn.recv(1024)
    print('Server received', repr(data))
    filename='mytext.txt'
    f = open(filename,'rb')
    l = f.read(1024)
    while (l):
        conn.send(l)
        print('Sent ',repr(l))
        l = f.read(1024)
    f.close()
    print('Done sending')
    conn.send('Thank you for connecting'.encode())
    conn.close()
```

Client code:

```
import socket
s = socket.socket()
host = socket.gethostname()
port = 60005
s.connect((host, port))
s.send("Hello server!")
```

```

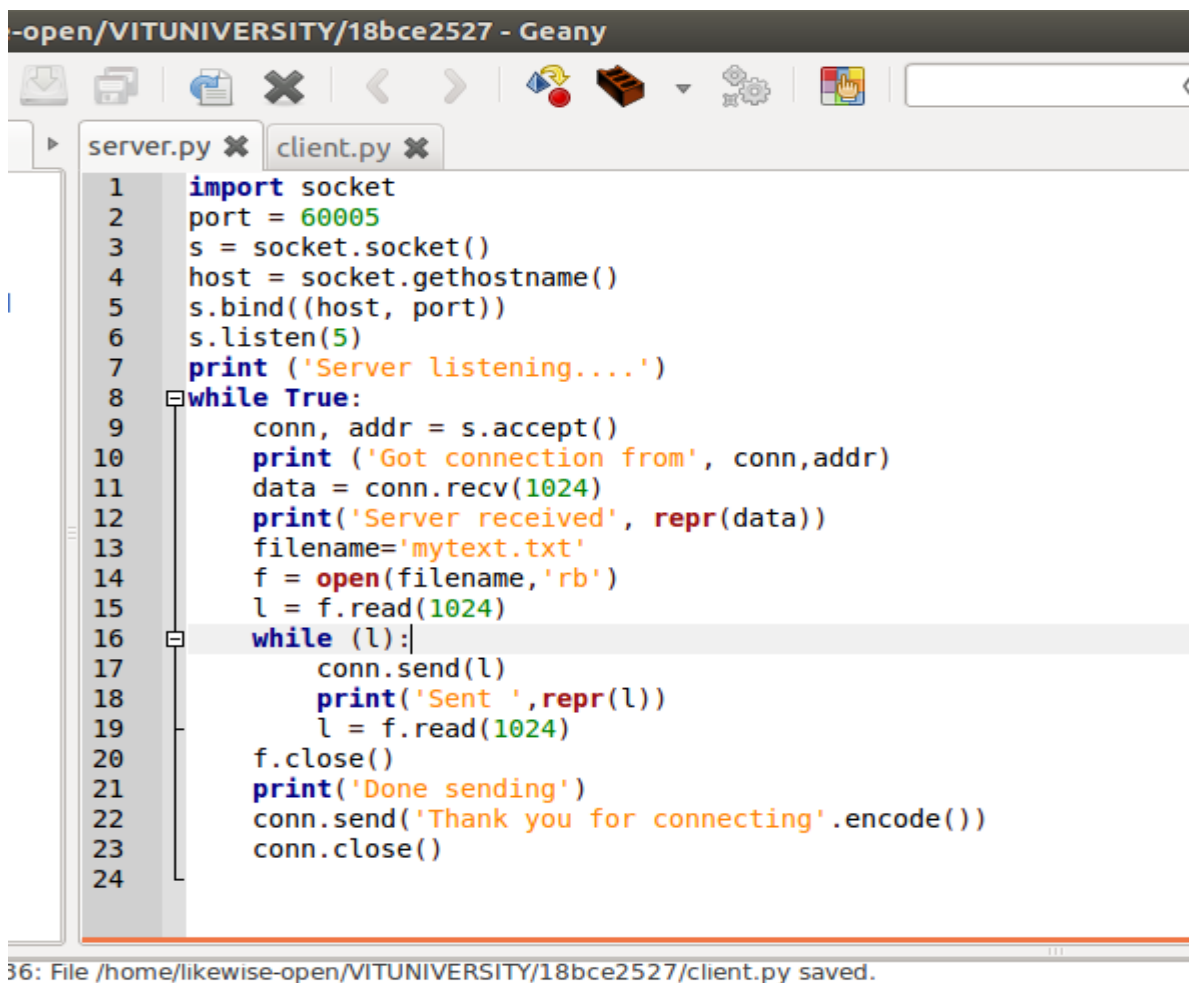
with open('received_file', 'wb') as f:
    print('file opened')
    while (True):
        print('receiving data...')
        data = s.recv(1024).decode()
        print('data=%s', (data))
        if not data:
            break
        f.write(data)
with open("mytext.txt") as f:
    with open("newfile.txt", "w") as fl:
        for line in f:
            fl.write(line)

fl.close()
f.close()
print('Successfully get the file')
s.close()
print('connection closed')

```

## Snapshots of typed code:

Server:

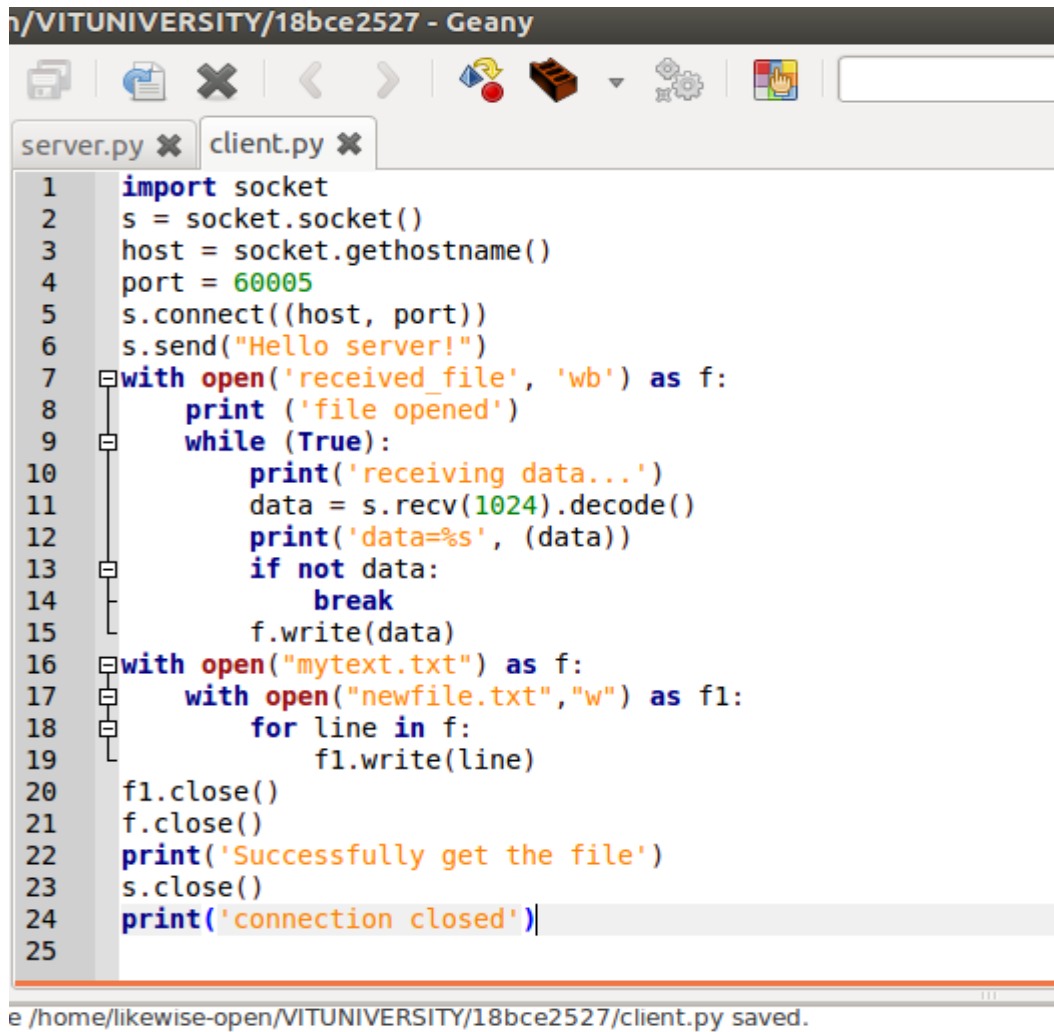


```

- open/VITUNIVERSITY/18bce2527 - Geany
server.py x client.py x
1  import socket
2  port = 60005
3  s = socket.socket()
4  host = socket.gethostname()
5  s.bind((host, port))
6  s.listen(5)
7  print('Server listening....')
8  while True:
9      conn, addr = s.accept()
10     print('Got connection from', conn, addr)
11     data = conn.recv(1024)
12     print('Server received', repr(data))
13     filename='mytext.txt'
14     f = open(filename, 'rb')
15     l = f.read(1024)
16     while l:|
17         conn.send(l)
18         print('Sent ', repr(l))
19         l = f.read(1024)
20     f.close()
21     print('Done sending')
22     conn.send('Thank you for connecting'.encode())
23     conn.close()
24
36: File /home/likewise-open/VITUNIVERSITY/18bce2527/client.py saved.

```

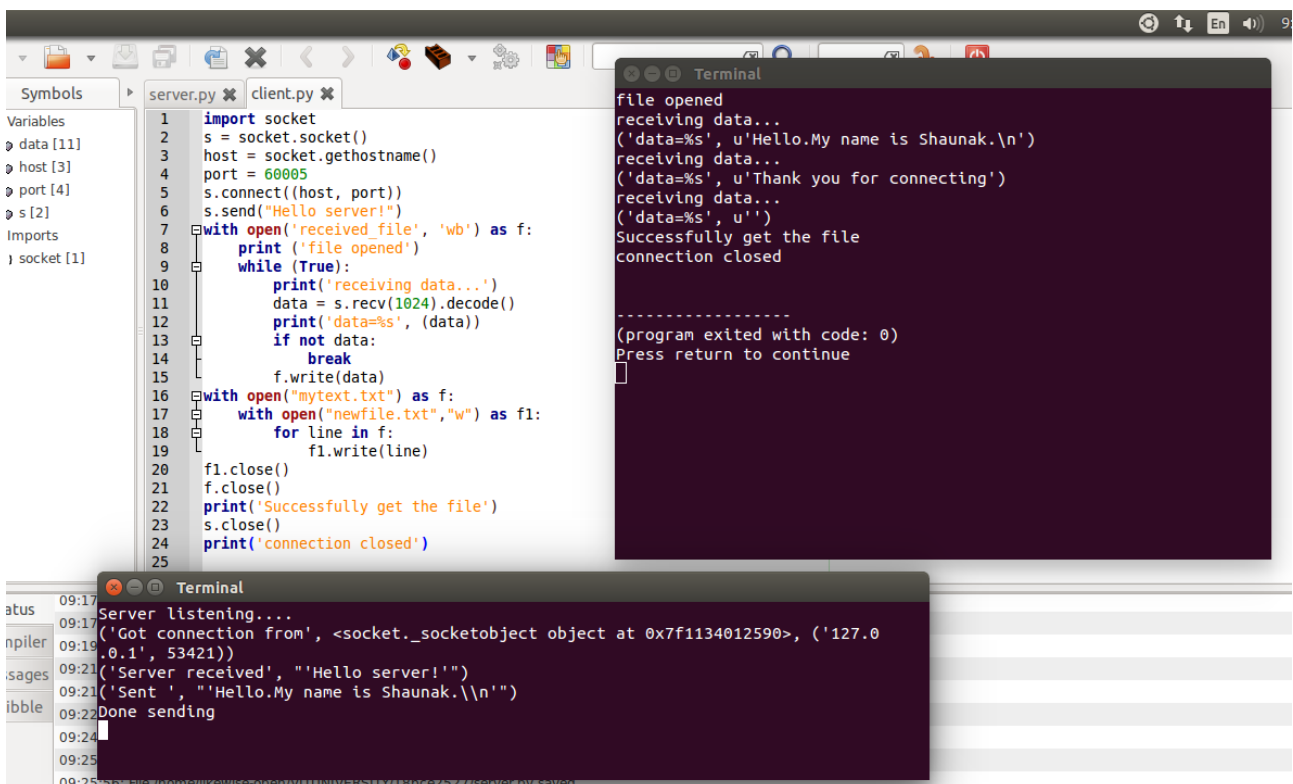
Client:



```
1 import socket
2 s = socket.socket()
3 host = socket.gethostname()
4 port = 60005
5 s.connect((host, port))
6 s.send("Hello server!")
7 with open('received_file', 'wb') as f:
8     print('file opened')
9     while (True):
10         print('receiving data...')
11         data = s.recv(1024).decode()
12         print('data=%s', (data))
13         if not data:
14             break
15         f.write(data)
16 with open("mytext.txt") as f:
17     with open("newfile.txt", "w") as f1:
18         for line in f:
19             f1.write(line)
20 f1.close()
21 f.close()
22 print('Successfully get the file')
23 s.close()
24 print('connection closed')
25
```

e /home/likewise-open/VITUNIVERSITY/18bce2527/client.py saved.

OUTPUT:

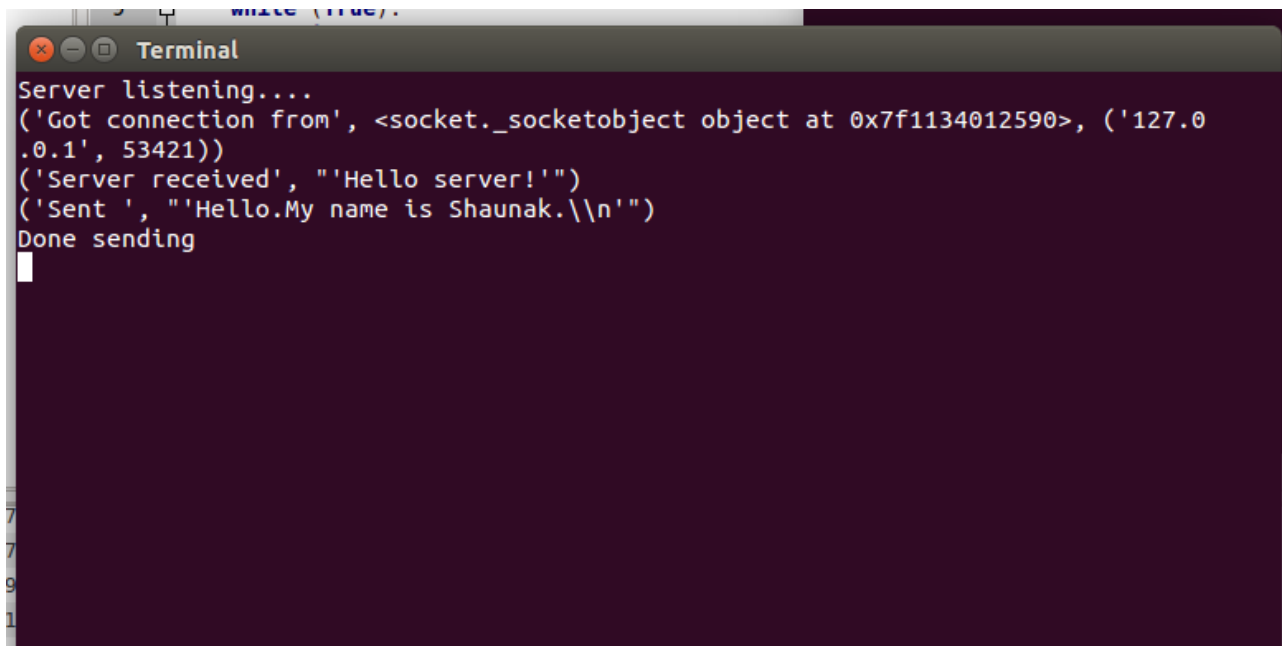


```
file opened
receiving data...
('data=%s', u'Hello.My name is Shaunak.\n')
receiving data...
('data=%s', u'Thank you for connecting')
receiving data...
('data=%s', u'')
Successfully get the file
connection closed

-----
(program exited with code: 0)
Press return to continue

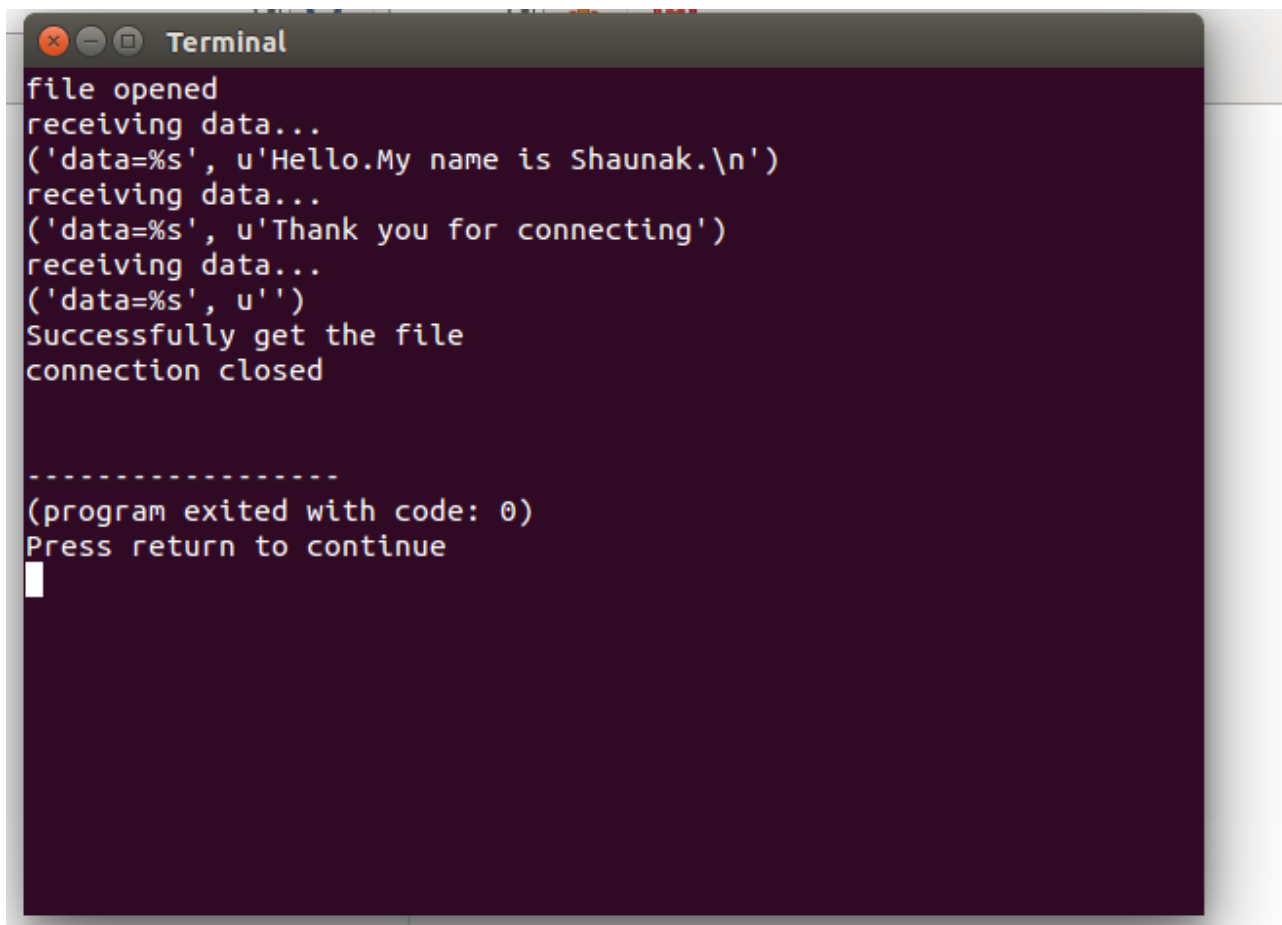
09:17 status Server listening...
09:17 ('Got connection from', <socket._socketobject object at 0x7f1134012590>, ('127.0
09:19 .0.1', 53421))
09:21 ('Server received', "'Hello server!'")
09:21 ('Sent ', "'Hello.My name is Shaunak.\\n'")
09:22 Done sending
09:24
09:25
09:25:56 File /home/likewise-open/VITUNIVERSITY/18bce2527/server.py saved.
```

## Server Output:

A terminal window titled "Terminal" with a dark background. It shows the output of a server program. The text is as follows:

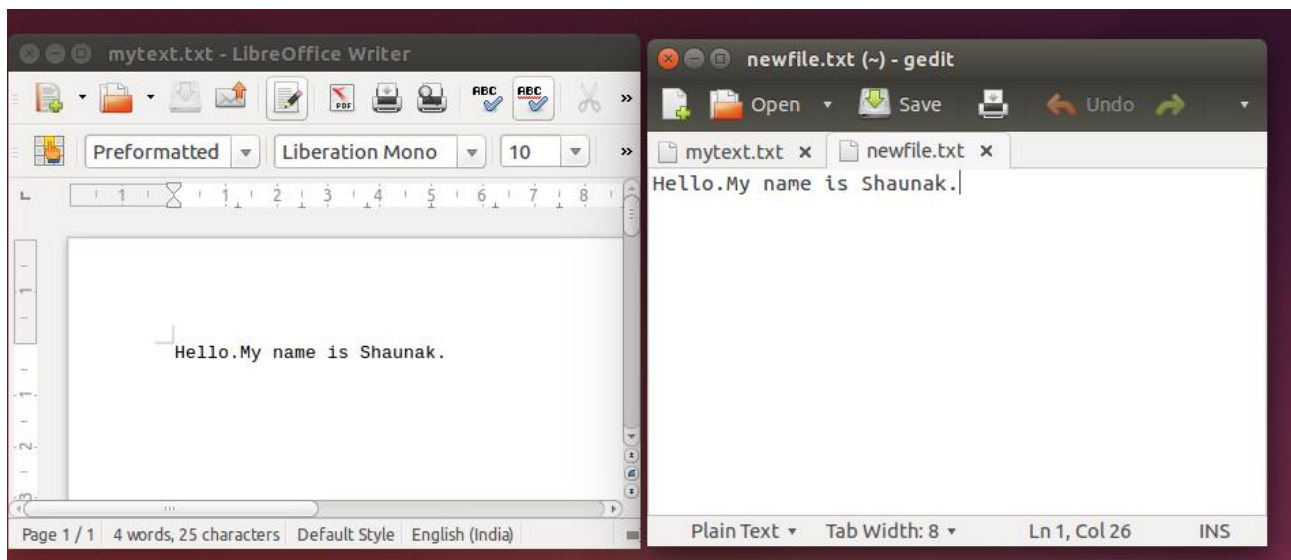
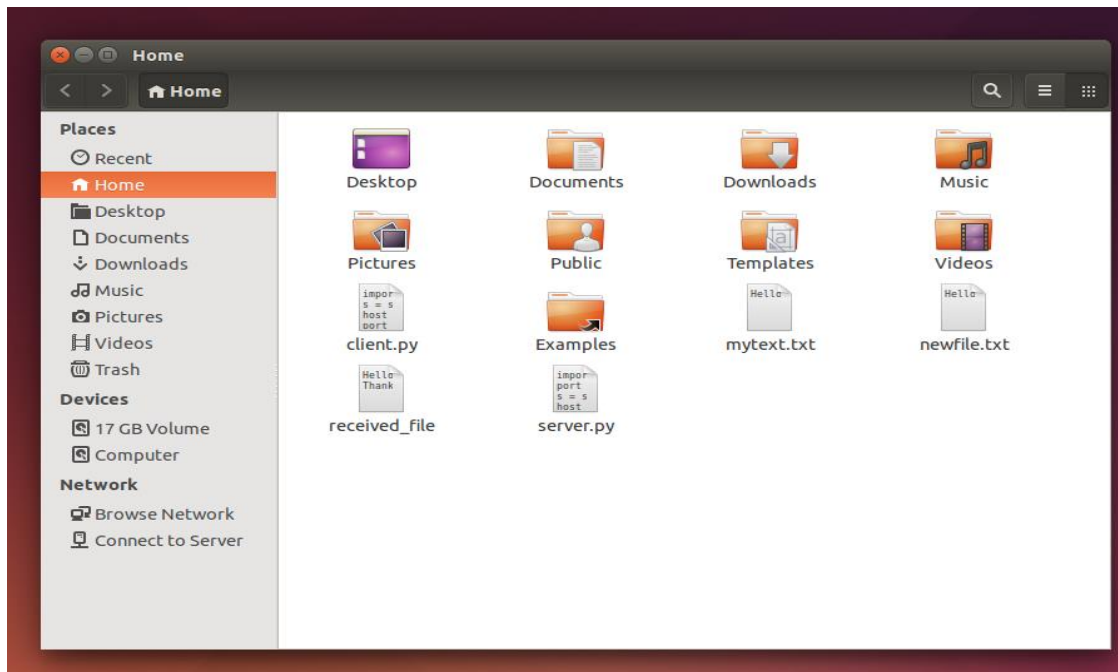
```
Server listening...  
( 'Got connection from', <socket._socketobject object at 0x7f1134012590>, ('127.0  
.0.1', 53421))  
( 'Server received', "'Hello server!'" )  
( 'Sent ', "'Hello.My name is Shaunak.\\n'" )  
Done sending
```

## Client Output:

A terminal window titled "Terminal" with a dark background. It shows the output of a client program. The text is as follows:

```
file opened  
receiving data...  
( 'data=%s', u'Hello.My name is Shaunak.\\n' )  
receiving data...  
( 'data=%s', u'Thank you for connecting' )  
receiving data...  
( 'data=%s', u'' )  
Successfully get the file  
connection closed  
  
-----  
(program exited with code: 0)  
Press return to continue
```

## File Output:



Here, the original file name is “mytext.txt” and the newly created file by the client side is “newfile.txt”.

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## Question 2:

**Q2. Write a TCP socket program for calculating the factorial of a number in the server program which is sent by the client program**

### Code:

Server Code:

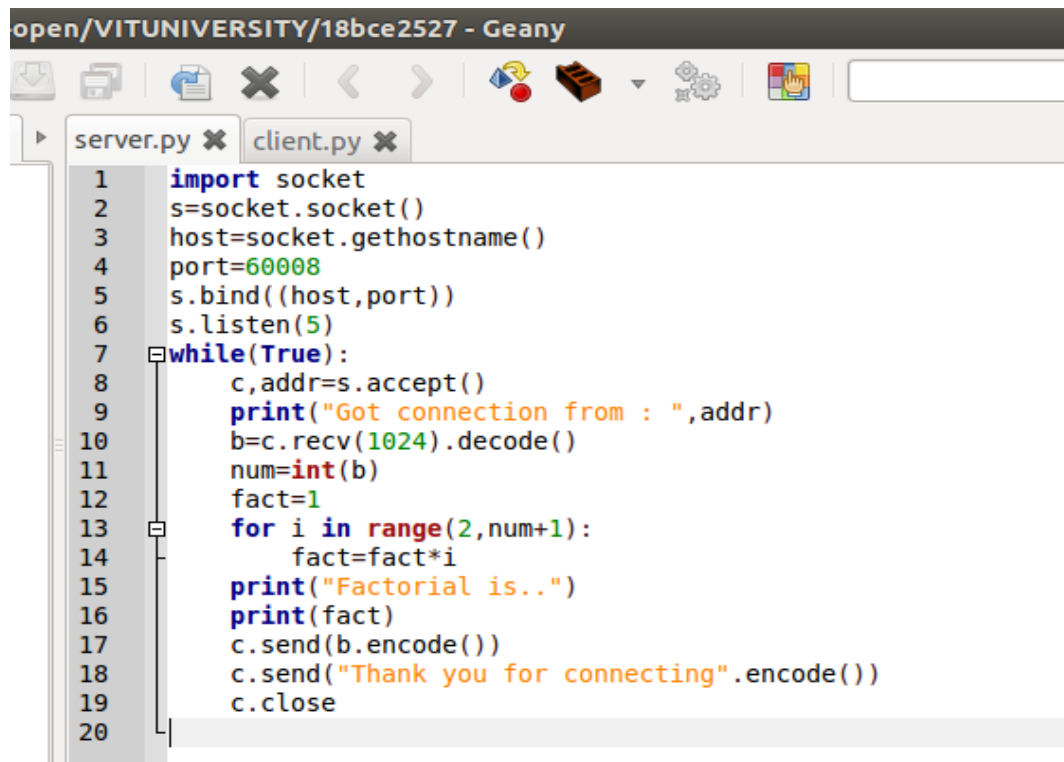
```
import socket
s=socket.socket()
host=socket.gethostname()
port=60008
s.bind((host,port))
s.listen(5)
while(True):
    c,addr=s.accept()
    print("Got connection from : ",addr)
    b=c.recv(1024).decode()
    num=int(b)
    fact=1
    for i in range(2,num+1):
        fact=fact*i
    print("Factorial is..")
    print(fact)
    c.send(b.encode())
    c.send("Thank you for connecting".encode())
    c.close
```

Client Code:

```
import socket
s=socket.socket()
host=socket.gethostname()
port=60008
print("Enter the number to find factorial..")
n=int(input())
a=str(n)
s.connect((host,port))
s.send(a.encode())
s.close
```

## Snapshots of typed code:

Server:



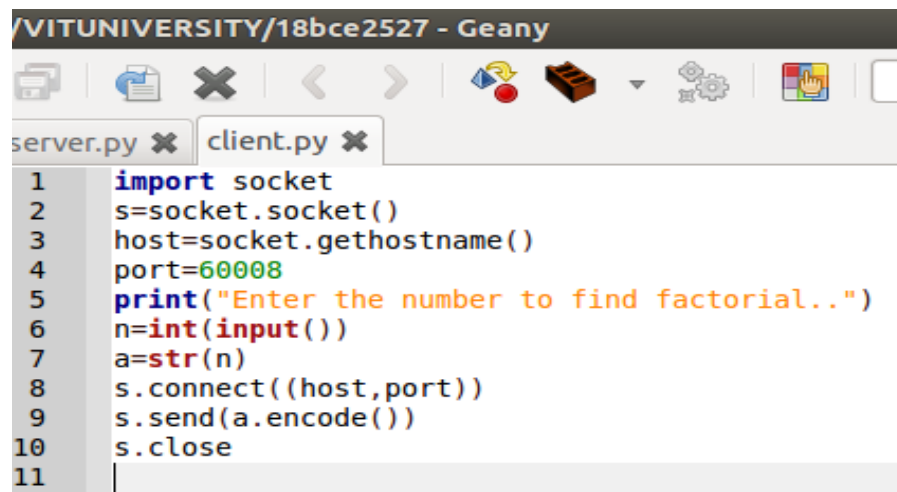
The screenshot shows the Geany IDE with a file named 'server.py' open. The code is a Python script that uses the socket module to create a server. It binds to the local host and port 60008, listens for connections, and then enters a loop where it accepts connections. For each connection, it prints the address, receives data, converts it to an integer, calculates its factorial, and sends the result back to the client. It also sends a 'Thank you for connecting' message before closing the connection.

```
1 import socket
2 s=socket.socket()
3 host=socket.gethostname()
4 port=60008
5 s.bind((host,port))
6 s.listen(5)
7 while(True):
8     c,addr=s.accept()
9     print("Got connection from : ",addr)
10    b=c.recv(1024).decode()
11    num=int(b)
12    fact=1
13    for i in range(2,num+1):
14        fact=fact*i
15    print("Factorial is..")
16    print(fact)
17    c.send(b.encode())
18    c.send("Thank you for connecting".encode())
19    c.close
20
```

Below the code editor, there is a status bar with the following messages:

- 1: This is Geany 1.23.1.
- 2: New file "untitled" opened.
- 0: File /home/likewise-open/VITUNIVERSITY/18bce2527/server.py saved.

Client:



The screenshot shows the Geany IDE with a file named 'client.py' open. The code is a Python script that uses the socket module to create a client. It connects to the server at the local host and port 60008, sends a string representing a number, and receives the factorial result back from the server.

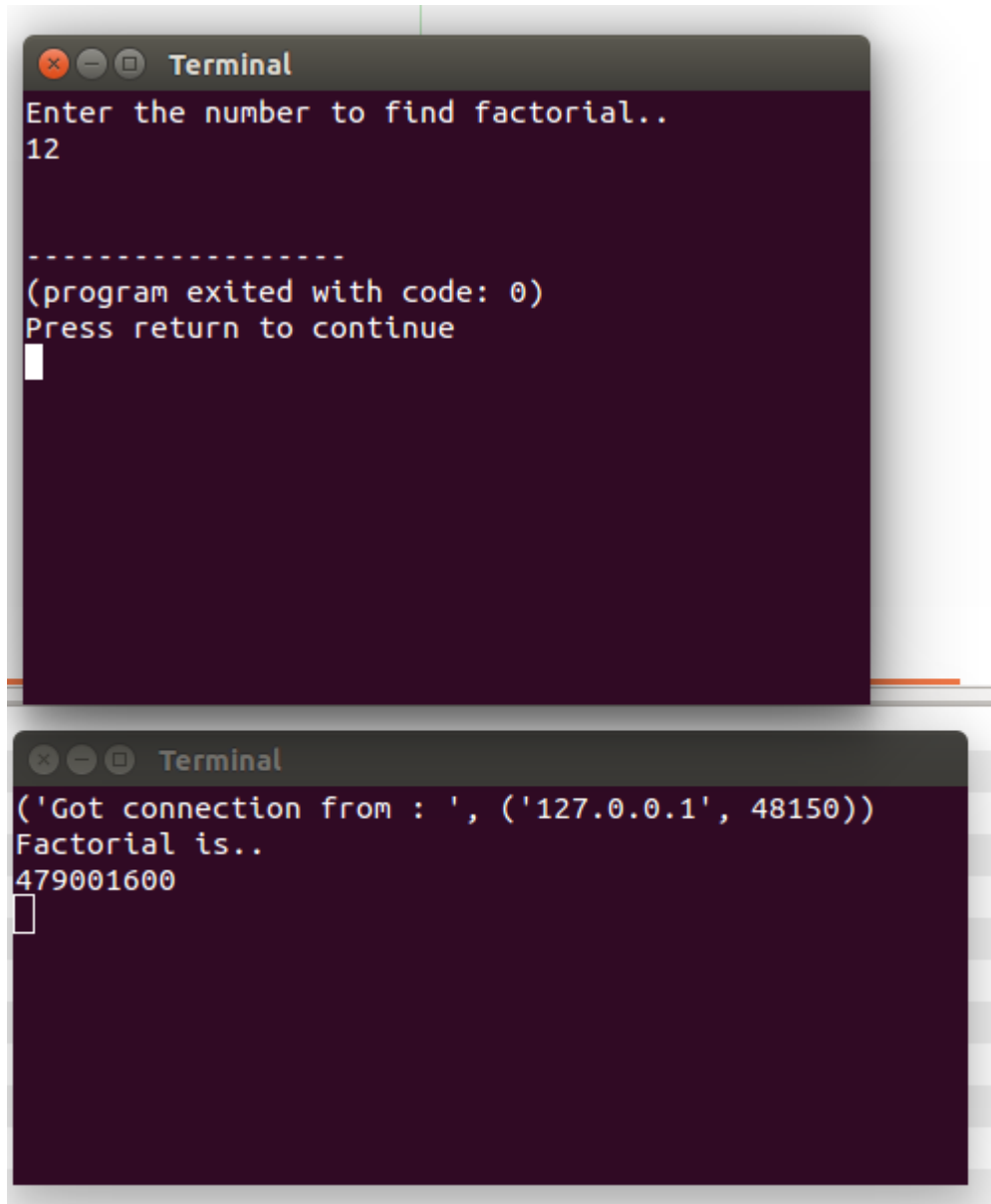
```
1 import socket
2 s=socket.socket()
3 host=socket.gethostname()
4 port=60008
5 print("Enter the number to find factorial..")
6 n=int(input())
7 a=str(n)
8 s.connect((host,port))
9 s.send(a.encode())
10 s.close
11
```

Below the code editor, there is a status bar with the following messages:

- s is Geany 1.23.1.
- v file "untitled" opened.
- /home/likewise-open/VITUNIVERSITY/18bce2527/server.py saved.

## Outputs:

1<sup>st</sup> Output:



The image shows two terminal windows. The top window, titled 'Terminal', displays the prompt 'Enter the number to find factorial..' followed by the input '12'. Below this, a dashed line separates the input from the output '(program exited with code: 0)'. The prompt 'Press return to continue' is shown with a cursor on the next line. The bottom window, also titled 'Terminal', shows the message '(\''Got connection from : ', ('127.0.0.1', 48150))' followed by 'Factorial is..' and the output '479001600'.

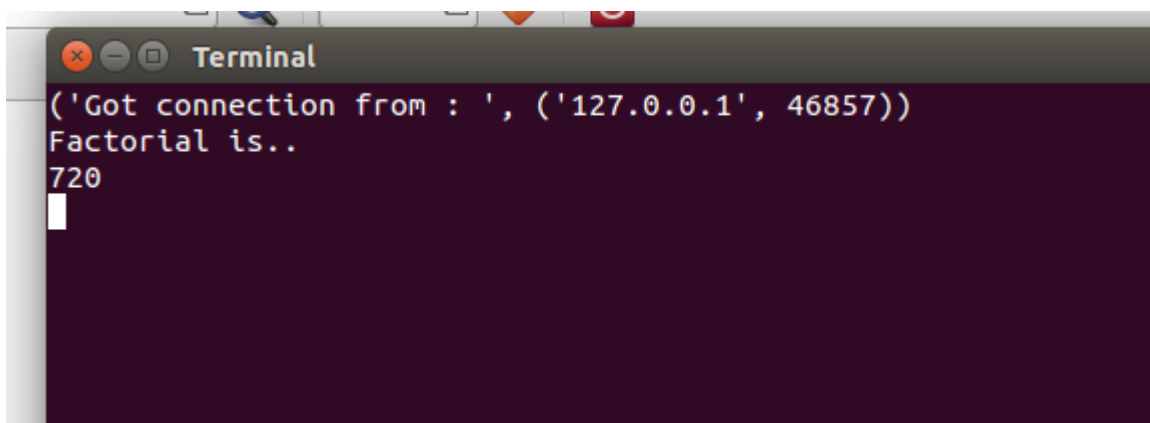
```
Terminal
Enter the number to find factorial..
12

-----
(program exited with code: 0)
Press return to continue
█

Terminal
(\''Got connection from : ', ('127.0.0.1', 48150))
Factorial is..
479001600
█
```

2<sup>nd</sup> Output:

Server Side

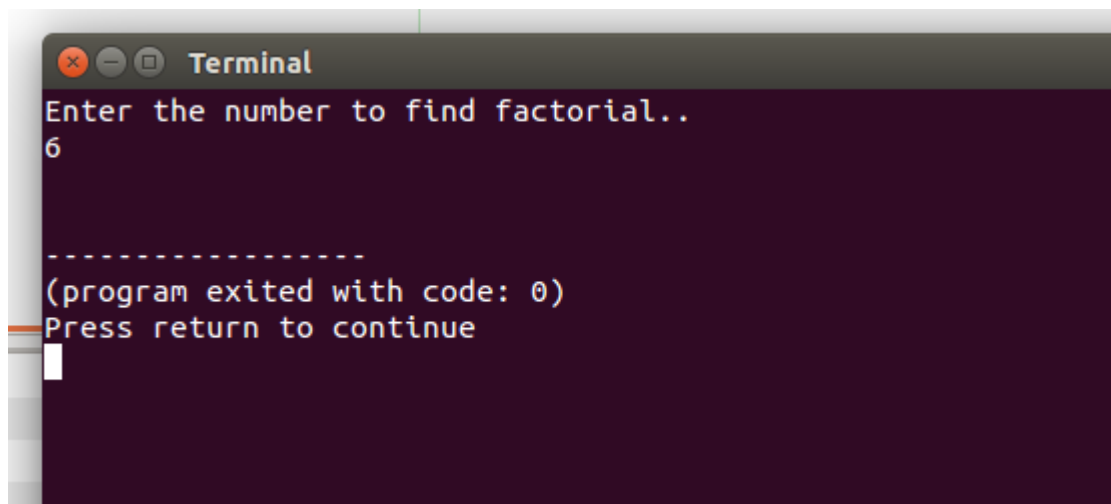


The image shows a terminal window titled 'Terminal' displaying the message '(\''Got connection from : ', ('127.0.0.1', 46857))' followed by 'Factorial is..' and the output '720'.

```
Terminal
(\''Got connection from : ', ('127.0.0.1', 46857))
Factorial is..
720
█
```



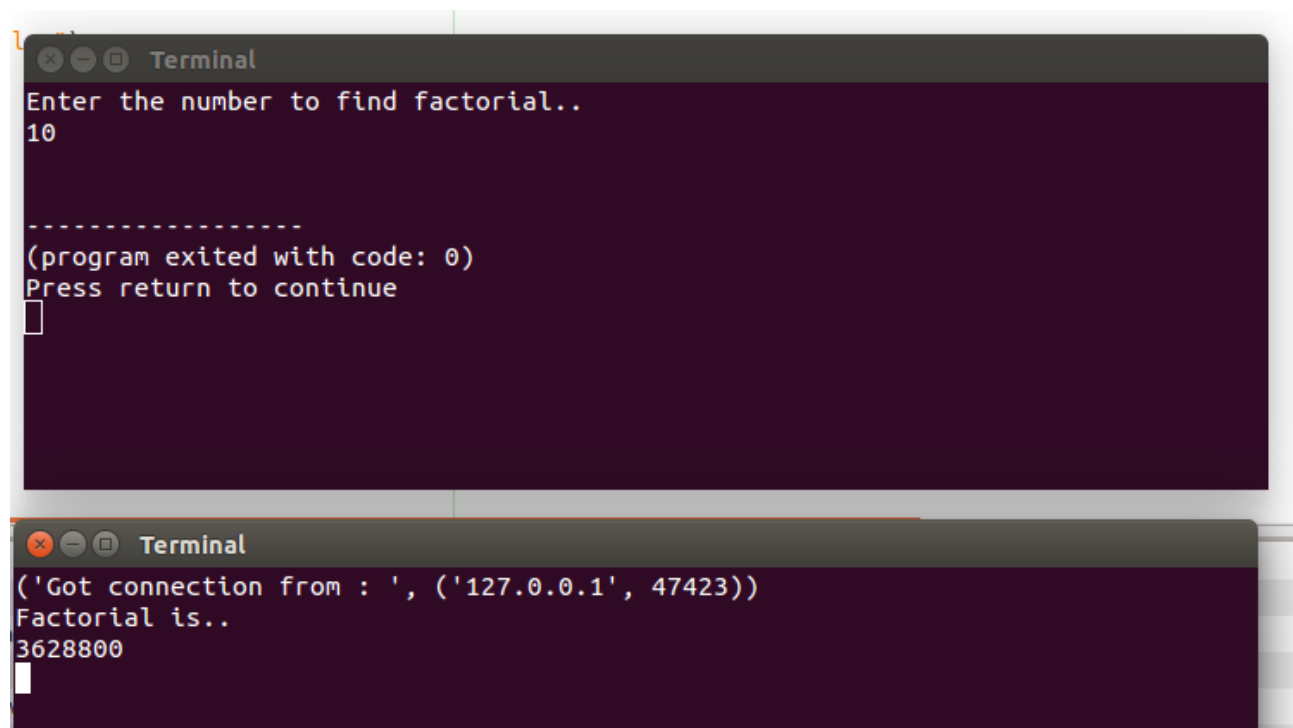
Client side:



```
Terminal
Enter the number to find factorial..
6

-----
(program exited with code: 0)
Press return to continue
```

3<sup>rd</sup> Output:



```
Terminal
Enter the number to find factorial..
10

-----
(program exited with code: 0)
Press return to continue

Terminal
('Got connection from : ', ('127.0.0.1', 47423))
Factorial is..
3628800
```

### Question3:

**Q3. Write a TCP socket program for user authentication by using the user [] and password [] arrays in the server program.**

#### Code:

Server Code:

```
import sys,socket
s=socket.socket()
host=socket.gethostname()
port=12375
s.bind((host,port))
s.listen(5)
print ("server is running: ",host,port)
while True:
    c,a=s.accept()
    print a
    usr=c.recv(7)
    pas=c.recv(7)
    print (usr,pas)
    if (usr=='shaunak' and pas=='abcd123'):
        c.send("Authenticated")
    else:
        c.send("invalid User")
c.close()
```

Client Code:

```
import sys,socket
s=socket.socket()
host=socket.gethostname()
port=12375
s.connect((host,port))
usr=raw_input("Enter user: ")
pas=raw_input("Enter pass: ")
print (usr,pas)
s.sendall(usr)
s.sendall(pas)
print (s.recv(1024))
s.close()
```

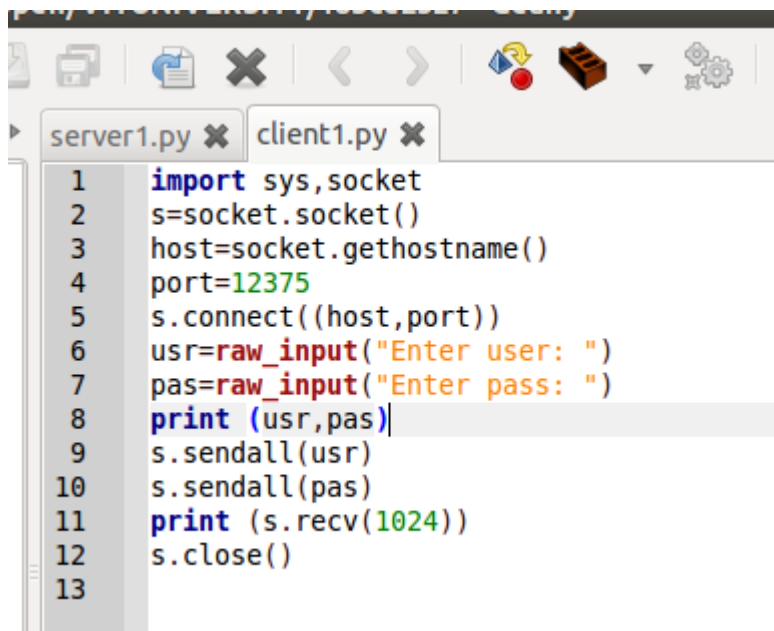
## Snapshots of typed code:

Server:



```
open/VITUNIVERSITY/18bce2527 - Geany
server1.py x client1.py x
1 import sys,socket
2 s=socket.socket()
3 host=socket.gethostname()
4 port=12375
5 s.bind((host,port))
6 s.listen(5)
7 print ("server is running: ",host,port)
8 while True:
9     c,a=s.accept()
10    print a
11    usr=c.recv(7)
12    pas=c.recv(7)
13    print (usr,pas)
14    if (usr=='shaunak' and pas=='abcd123'):
15        c.send("Authenticated")
16    else:
17        c.send("invalid User")
18    c.close()
19
File /home/likewise-open/VITUNIVERSITY/18bce2527/server1.py saved
New file "untitled" opened.
```

Client :

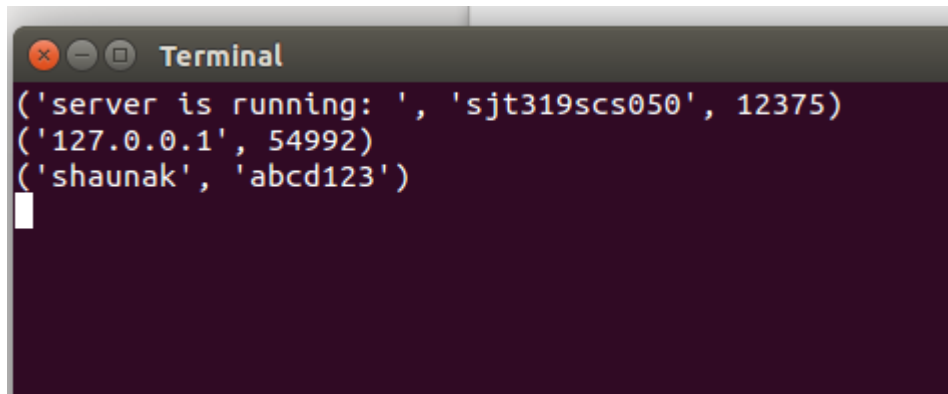


```
open/VITUNIVERSITY/18bce2527 - Geany
server1.py x client1.py x
1 import sys,socket
2 s=socket.socket()
3 host=socket.gethostname()
4 port=12375
5 s.connect((host,port))
6 usr=raw_input("Enter user: ")
7 pas=raw_input("Enter pass: ")
8 print (usr,pas)
9 s.sendall(usr)
10 s.sendall(pas)
11 print (s.recv(1024))
12 s.close()
13
File /home/likewise-open/VITUNIVERSITY/18bce2527/client1.py saved
New file "untitled" opened.
```

## Output:

1<sup>st</sup> output:

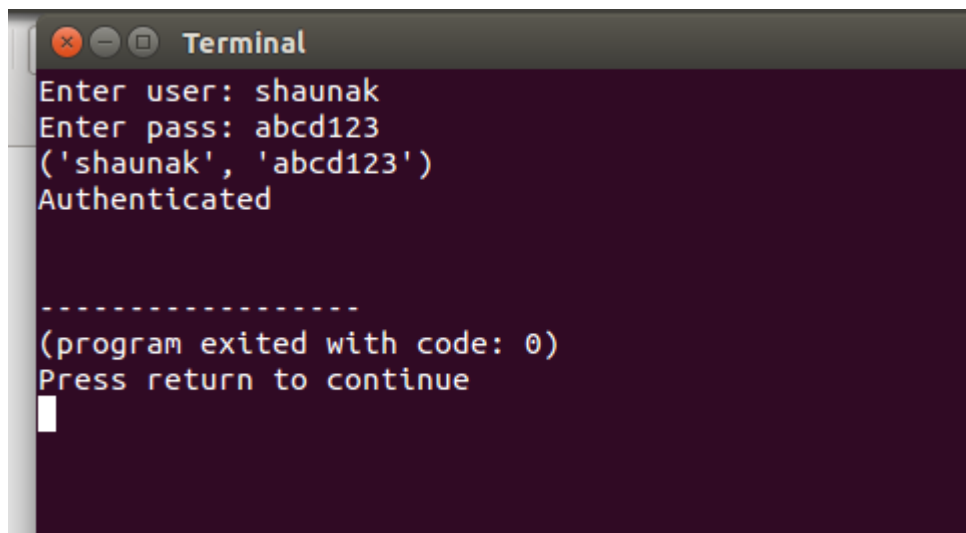
Server side:

A terminal window titled "Terminal" with a dark background. It displays three lines of text: ('server is running: ', 'sjt319scs050', 12375), ('127.0.0.1', 54992), and ('shaunak', 'abcd123'). A white cursor is visible on the line following the last tuple.

```
Terminal
('server is running: ', 'sjt319scs050', 12375)
('127.0.0.1', 54992)
('shaunak', 'abcd123')

```

Client side:

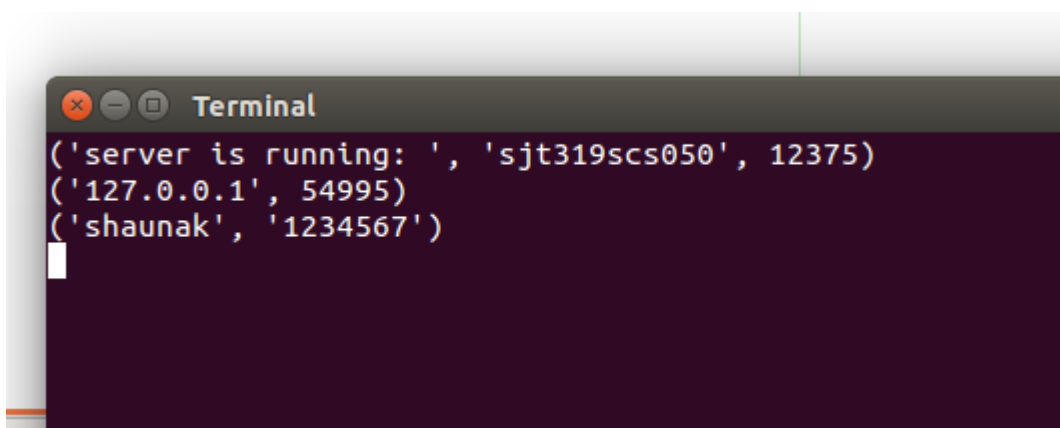
A terminal window titled "Terminal" with a dark background. It displays a sequence of prompts and user input: "Enter user: shaunak", "Enter pass: abcd123", and the tuple ('shaunak', 'abcd123'). This is followed by the word "Authenticated", a dashed line separator, and the message "(program exited with code: 0)". The prompt "Press return to continue" is at the bottom, with a white cursor on the line below it.

```
Terminal
Enter user: shaunak
Enter pass: abcd123
('shaunak', 'abcd123')
Authenticated
-----
(program exited with code: 0)
Press return to continue

```

2<sup>nd</sup> output:

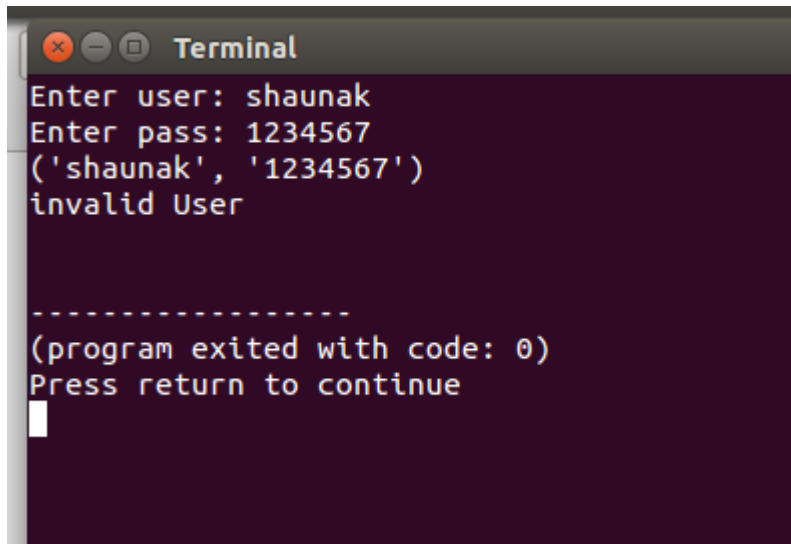
Server Side:

A terminal window titled "Terminal" with a dark background. It displays three lines of text: ('server is running: ', 'sjt319scs050', 12375), ('127.0.0.1', 54995), and ('shaunak', '1234567'). A white cursor is visible on the line following the last tuple.

```
Terminal
('server is running: ', 'sjt319scs050', 12375)
('127.0.0.1', 54995)
('shaunak', '1234567')

```

Client Side:



```
Terminal
Enter user: shaunak
Enter pass: 1234567
('shaunak', '1234567')
invalid User

-----
(program exited with code: 0)
Press return to continue
```

Here the user name is “shaunak” and password is “abcd123” each of length 7 characters.

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