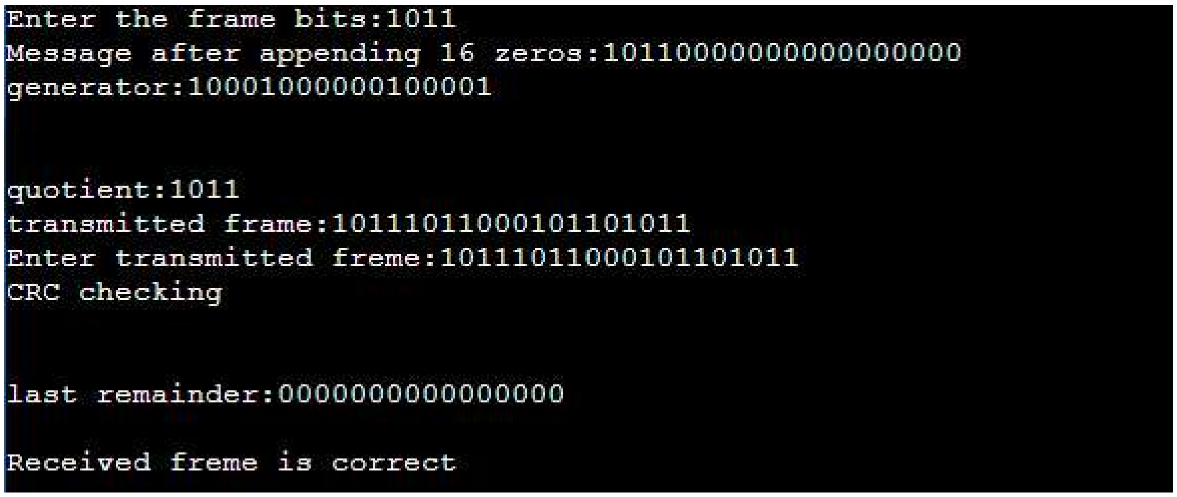
CYCLE - 2
USN : 1BM21CS179

1.Write a program for error detecting code using CRC-CCITT(16-bits)

```
#include<stdio.h>
char m[50],g[50],r[50],q[50],temp[50];
void caltrans(int);
void crc(int);
void calram();
void shiftl();
int main()
{
int n,i=0;
char ch,flag=0;
printf("Enter the frame bits:");
while((ch=getc(stdin))!='\n')
m[i++]=ch;
n=i;
for(i=0;i<16;i++)
m[n++]='0';
m[n]='\0';
printf("Message after appending 16 zeros:%s",m);
for(i=0;i<=16;i++)
g[i]='0';
g[0]=g[4]=g[11]=g[16]='1';g[17]='\0';
printf("\ngenerator:%s\n",g);
crc(n);
printf("\n\nquotient:%s",q);
caltrans(n);
printf("\ntransmitted frame:%s",m);
printf("\nEnter transmitted frame:");
scanf("\n%s",m);
printf("CRC checking\n");
crc(n);
printf("\n\nlast remainder:%s",r);
for(i=0;i<16;i++)
if(r[i]!='0')
flag=1;
else
continue;
if(flag==1)
printf("Error during transmission");
else
printf("\n\nReceived freme is correct");
}
void crc(int n)
{
int i,j;
for(i=0;i<n;i++)
temp[i]=m[i];
for(i=0;i<16;i++)
r[i]=m[i];
//printf("\nintermediate remainder\n");
for(i=0;i<n-16;i++)
{
if(r[0]=='1')
{
q[i]='1';
calram();
}
else
{
q[i]='0';
shiftl();
}
r[16]=m[17+i];
r[17]='\0';
//printf("\nremainder %d:%s",i+1,r);
for(j=0;j<=17;j++)
temp[j]=r[j];
}
q[n-16]='\0';
}
void calram()
{
int i,j;
for(i=1;i<=16;i++)
r[i-1]=((int)temp[i]-48)^((int)g[i]-48)+48;
}
void shiftl()
{
int i;
for(i=1;i<=16;i++)
r[i-1]=r[i];
}
void caltrans(int n)
```

```
{
int i,k=0;
for(i=n-16;i<n;i++)
m[i]=((int)m[i]-48)^((int)r[k++]-48)+48;
m[i]='\0';
}
```

OUTPUT-

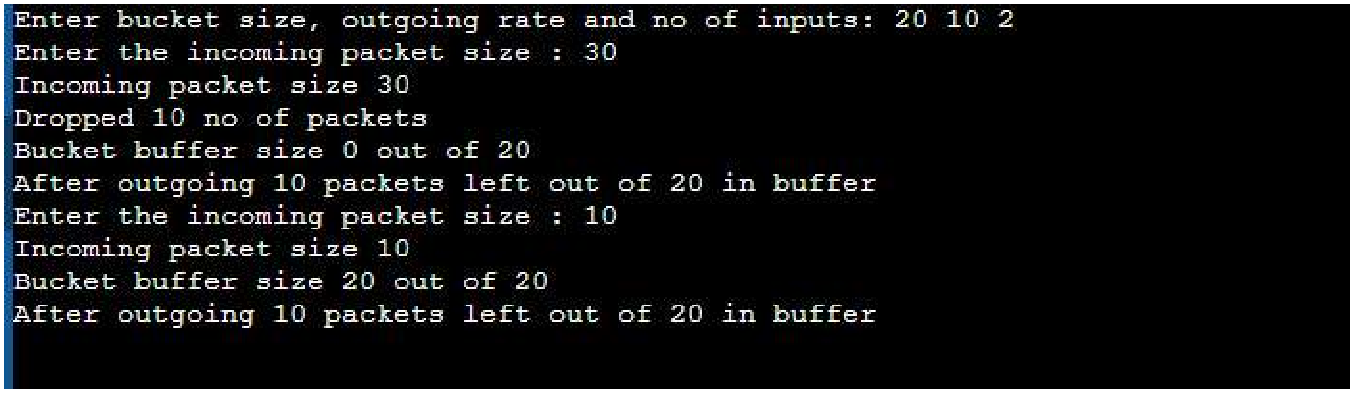


```
Enter the frame bits:1011
Message after appending 16 zeros:10110000000000000000
generator:10001000000100001


quotient:1011
transmitted frame:10111011000101101011
Enter transmitted freme:10111011000101101011
CRC checking


last remainder:0000000000000000

Received freme is correct
```

2.Write a program for congestion control using Leaky bucket Algorithm.

```
#include<stdio.h>

int main(){
    int incoming, outgoing, buck_size, n, store = 0;
    printf("Enter bucket size, outgoing rate and no of inputs: ");
    scanf("%d %d %d", &buck_size, &outgoing, &n);

    while (n != 0) {
        printf("Enter the incoming packet size : ");
        scanf("%d", &incoming);
        printf("Incoming packet size %d\n", incoming);
        if (incoming <= (buck_size - store)){
            store += incoming;
            printf("Bucket buffer size %d out of %d\n", store, buck_size);
        } else {
            printf("Dropped %d no of packets\n", incoming - (buck_size - store));
            printf("Bucket buffer size %d out of %d\n", store, buck_size);
            store = buck_size;
        }
        store = store - outgoing;
        printf("After outgoing %d packets left out of %d in buffer\n", store, buck_size);
        n--;
    }
}
```

Output-



```
Enter bucket size, outgoing rate and no of inputs: 20 10 2
Enter the incoming packet size : 30
Incoming packet size 30
Dropped 10 no of packets
Bucket buffer size 0 out of 20
After outgoing 10 packets left out of 20 in buffer
Enter the incoming packet size : 10
Incoming packet size 10
Bucket buffer size 20 out of 20
After outgoing 10 packets left out of 20 in buffer
```

3.Using TCP/IP sockets, write a client-server program to make the client send the file name and the server to send back the contents of the requested file if present.

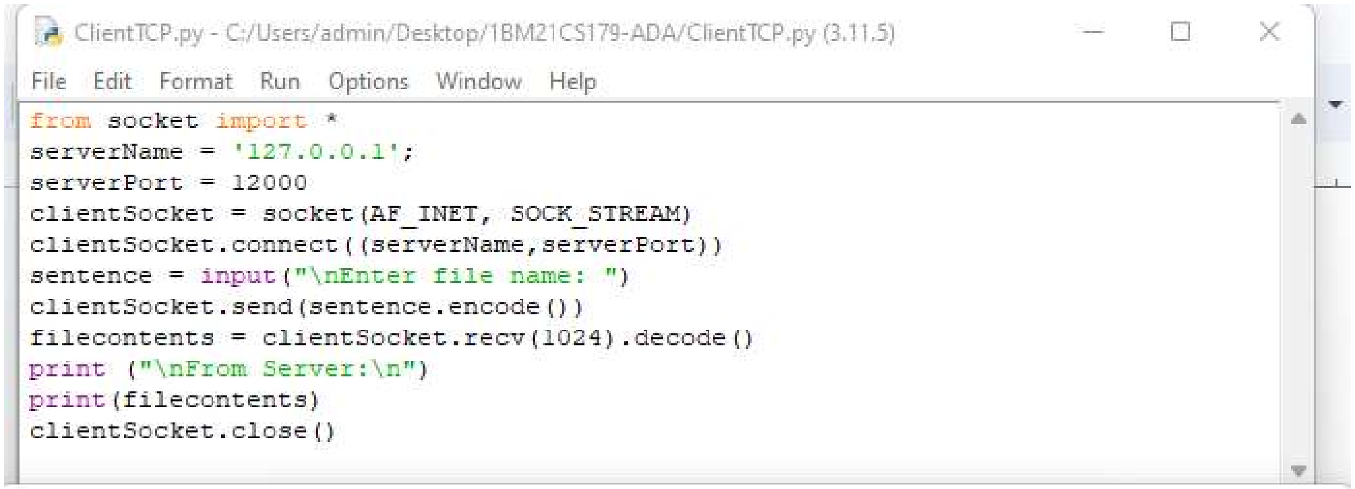
ServerTCP.py

```
from socket import *
serverName="127.0.0.1";
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
    print ("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()
    file=open(sentence,"r")
    l=file.read(1024)

    connectionSocket.send(l.encode())
    print ("\nSent contents of " + sentence)
    file.close()
    connectionSocket.close()
```

ClientTCP.py

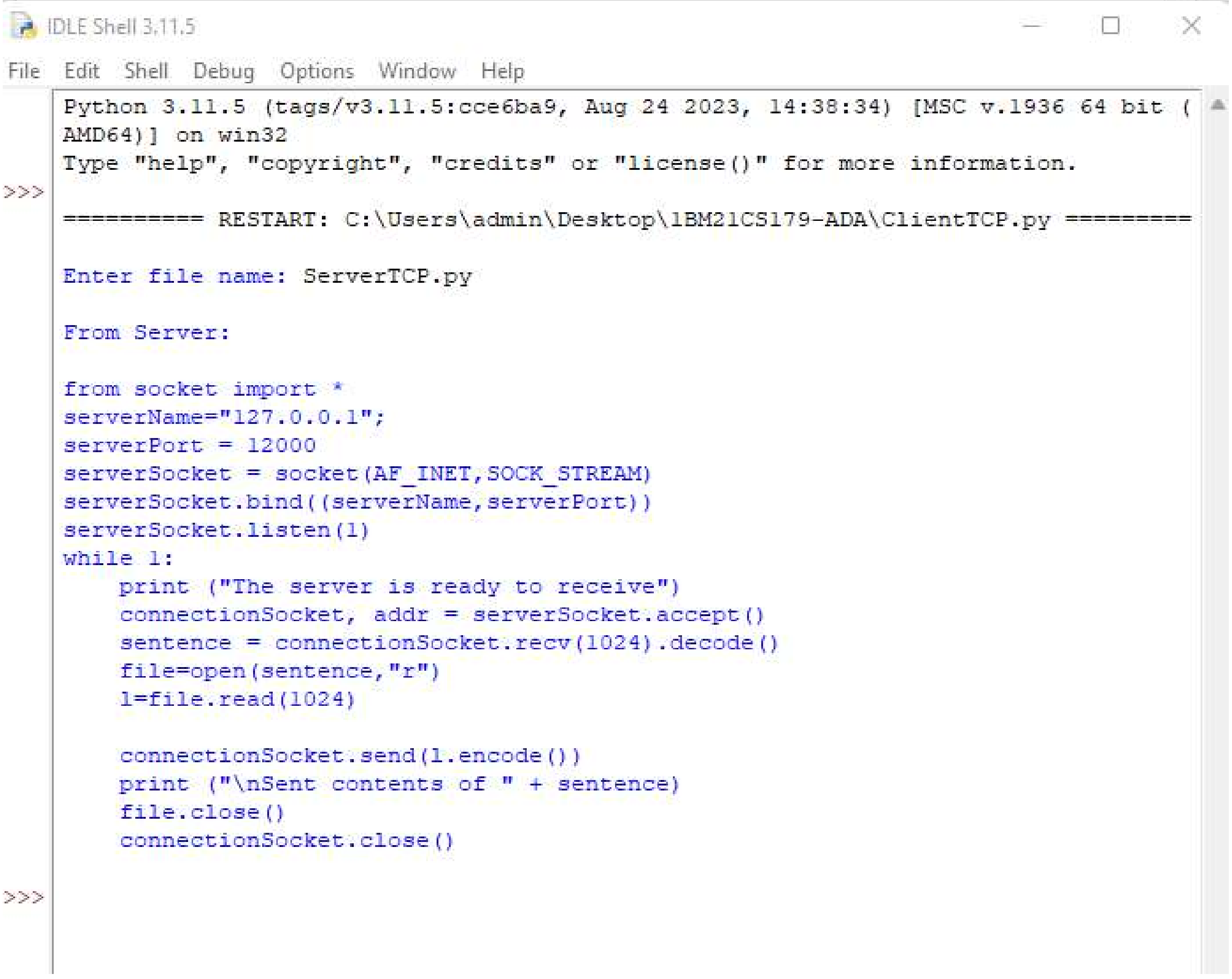
```
from socket import *
serverName = '127.0.0.1';
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ("\nFrom Server:\n")
print(filecontents)
clientSocket.close()
```

OUTPUT-


ClientTCP.py - C:/Users/admin/Desktop/1BM21CS179-ADA/ClientTCP.py (3.11.5)

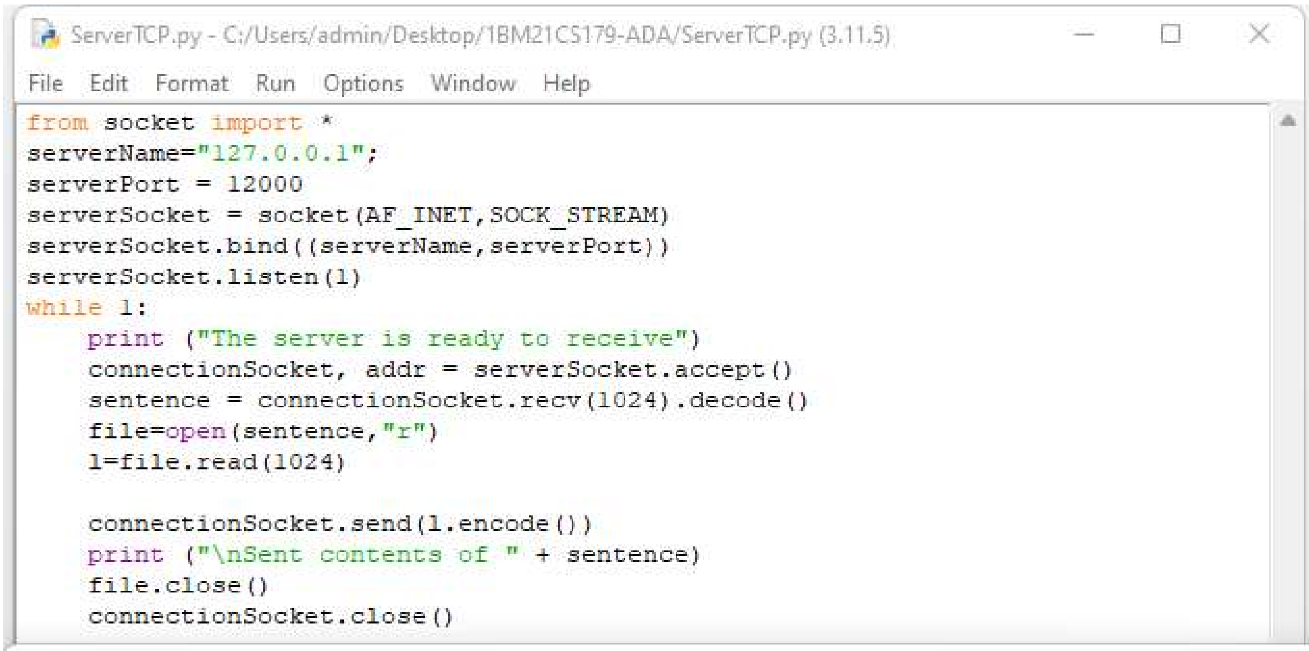
File Edit Format Run Options Window Help

```
from socket import *
serverName = '127.0.0.1';
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ("\nFrom Server:\n")
print(filecontents)
clientSocket.close()
```

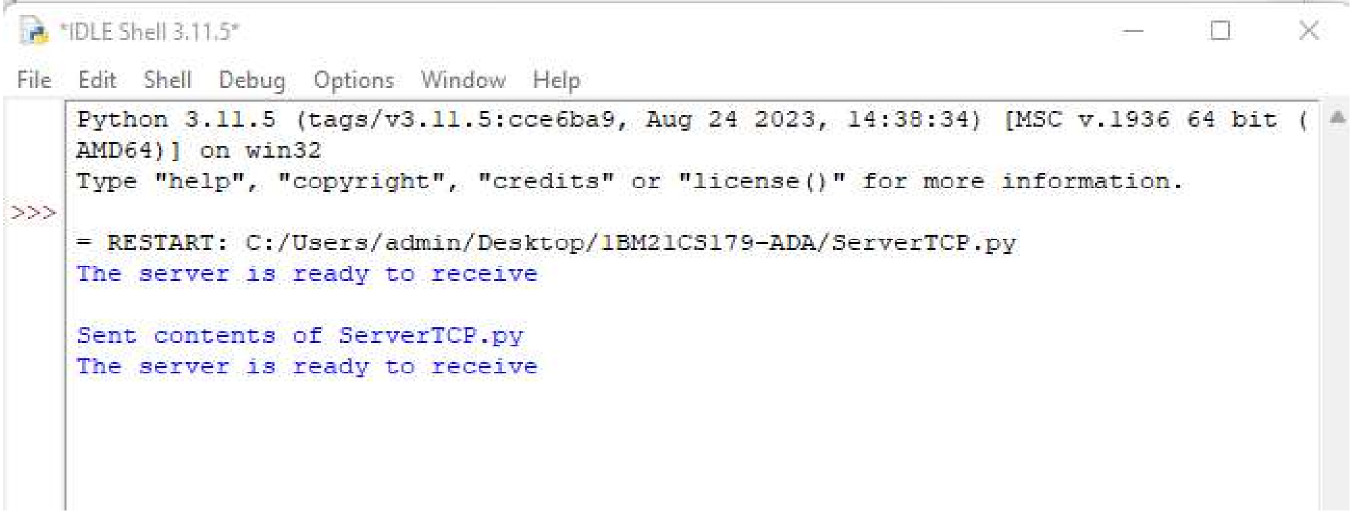

IDLE Shell 3.11.5

File Edit Shell Debug Options Window Help

```
    Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
    AMD64)] on win32
    Type "help", "copyright", "credits" or "license()" for more information.
>>>
    ========== RESTART: C:\Users\admin\Desktop\1BM21CS179-ADA\ClientTCP.py =========

    Enter file name: ServerTCP.py

    From Server:

    from socket import *
    serverName="127.0.0.1";
    serverPort = 12000
    serverSocket = socket(AF_INET,SOCK_STREAM)
    serverSocket.bind((serverName,serverPort))
    serverSocket.listen(1)
    while 1:
        print ("The server is ready to receive")
        connectionSocket, addr = serverSocket.accept()
        sentence = connectionSocket.recv(1024).decode()
        file=open(sentence,"r")
        l=file.read(1024)

        connectionSocket.send(l.encode())
        print ("\nSent contents of " + sentence)
        file.close()
        connectionSocket.close()

>>>
```

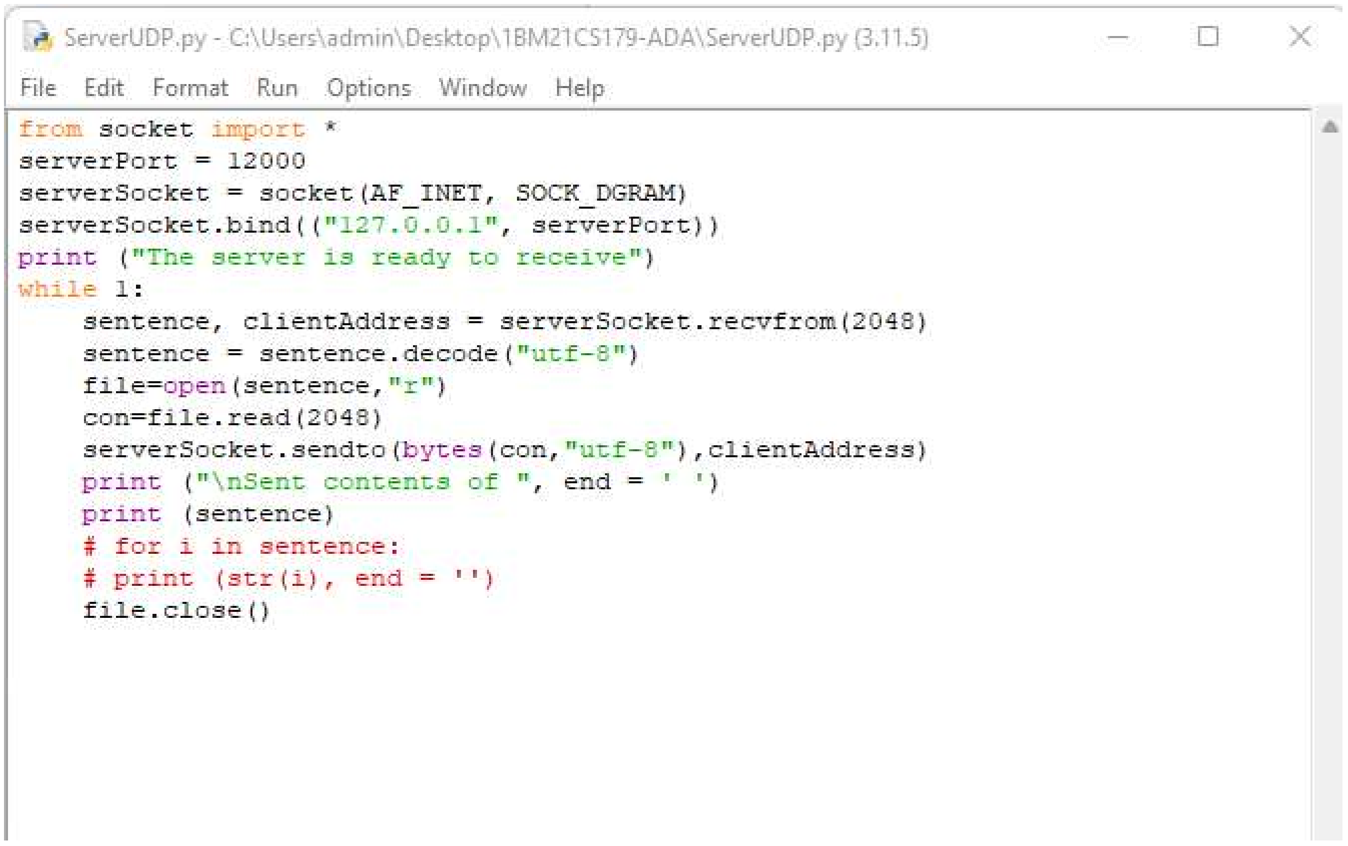

ServerTCP.py - C:/Users/admin/Desktop/1BM21CS179-ADA/ServerTCP.py (3.11.5)

```python
from socket import *
serverName="127.0.0.1";
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
    print ("The server is ready to receive")
    connectionSocket, addr = serverSocket.accept()
    sentence = connectionSocket.recv(1024).decode()
    file=open(sentence,"r")
    l=file.read(1024)

    connectionSocket.send(l.encode())
    print ("\nSent contents of " + sentence)
    file.close()
    connectionSocket.close()
```

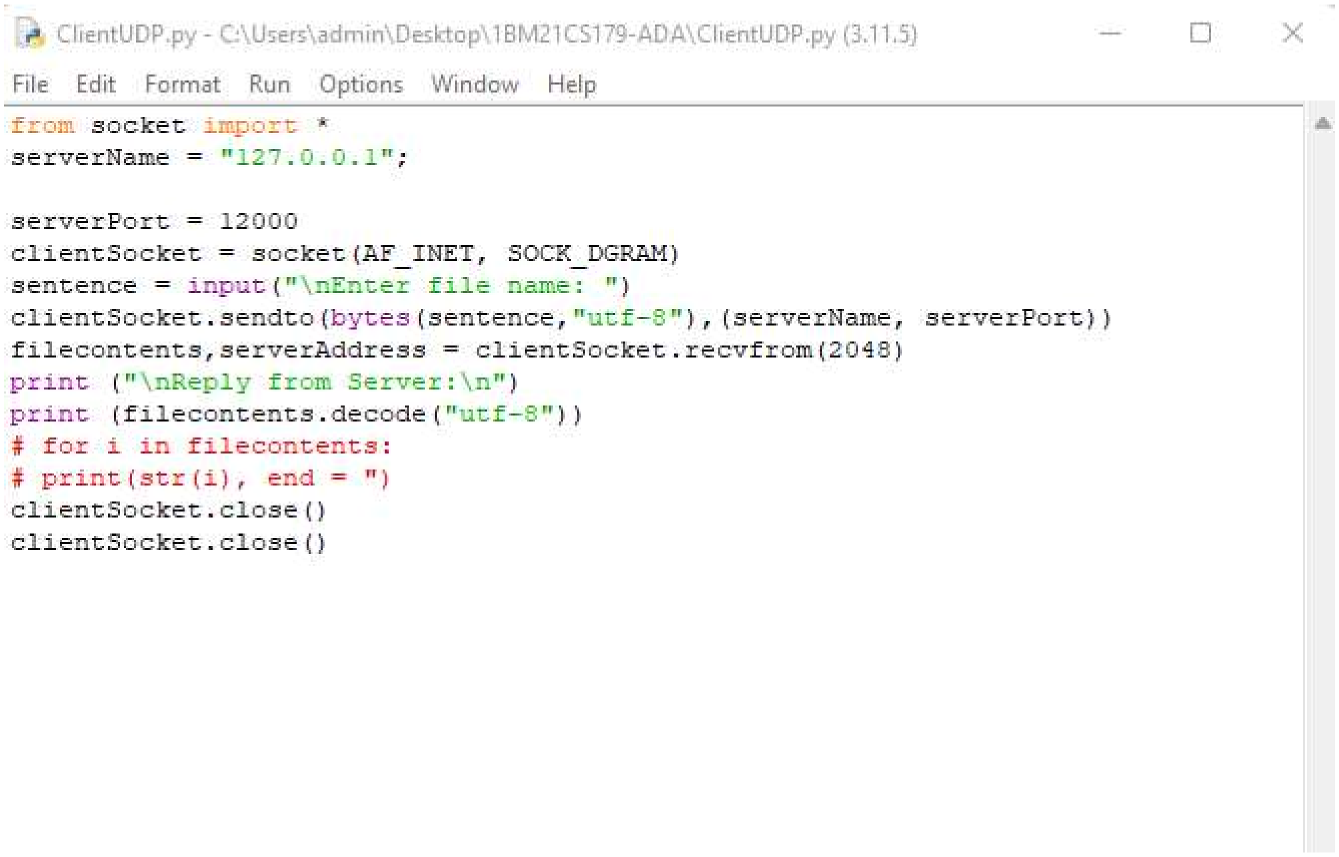

IDLE Shell 3.11.5

```
Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/admin/Desktop/1BM21CS179-ADA/ServerTCP.py
The server is ready to receive

Sent contents of ServerTCP.py
The server is ready to receive
```

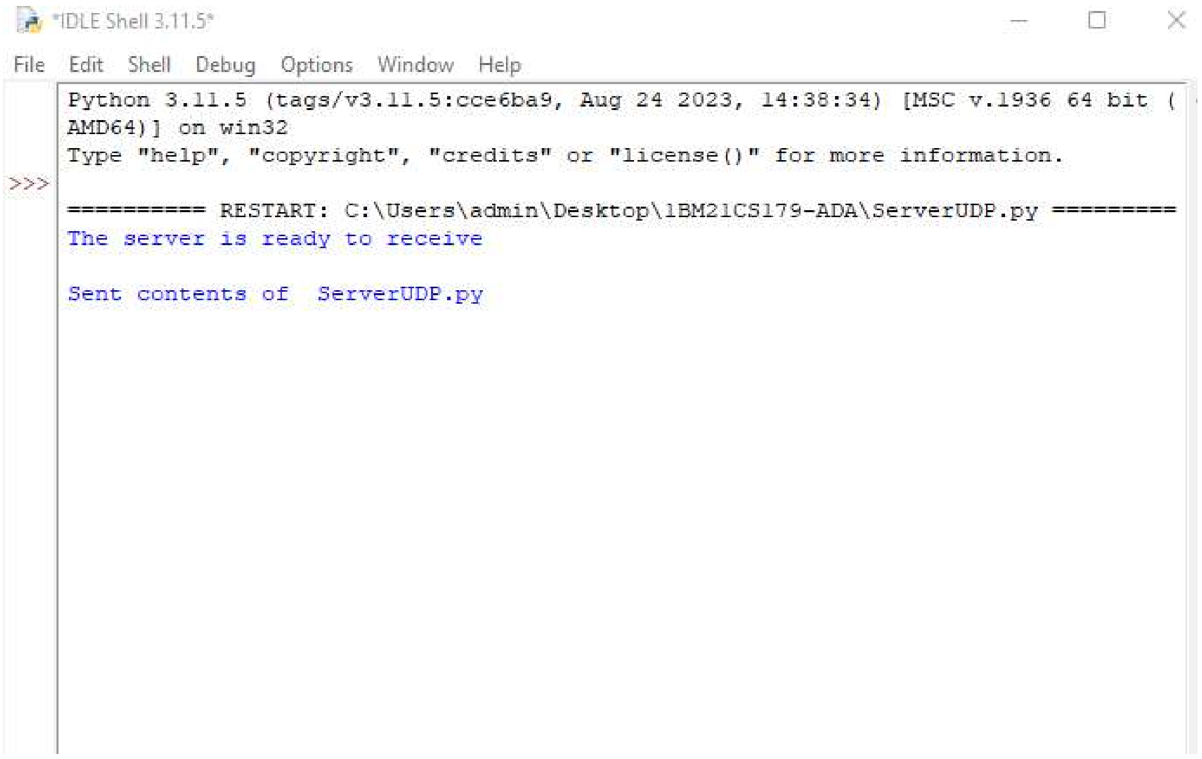
4. Using UDP sockets, write a client-server program to make the client send the file name and the server to send back the contents of the requested file if present.


ServerUDP.py - C:\Users\admin\Desktop\1BM21CS179-ADA\ServerUDP.py (3.11.5)
File Edit Format Run Options Window Help

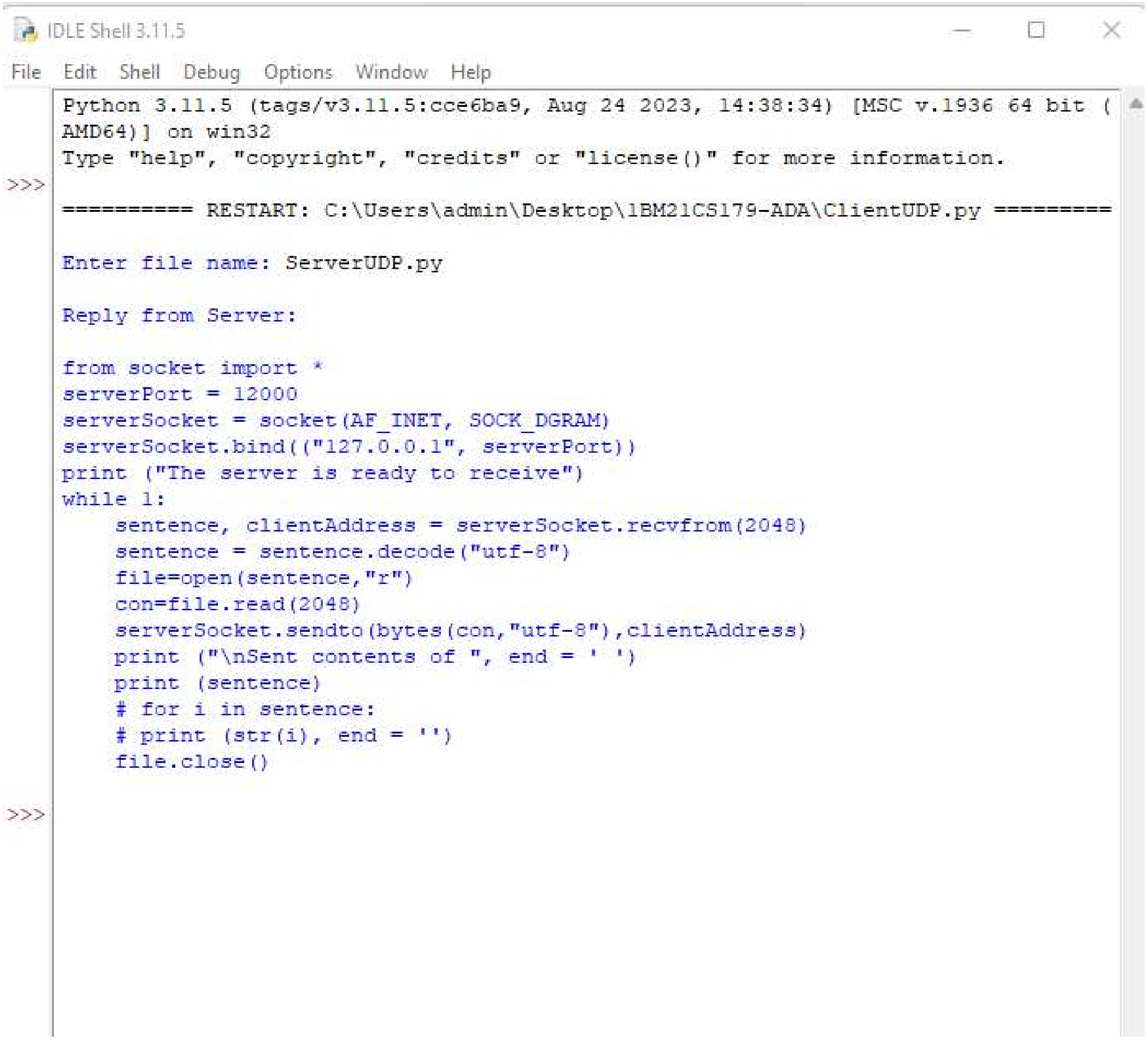
```
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file=open(sentence,"r")
    con=file.read(2048)
    serverSocket.sendto(bytes(con,"utf-8"),clientAddress)
    print ("\nSent contents of ", end = ' ')
    print (sentence)
    # for i in sentence:
    # print (str(i), end = '')
    file.close()
```


ClientUDP.py - C:\Users\admin\Desktop\1BM21CS179-ADA\ClientUDP.py (3.11.5)
File Edit Format Run Options Window Help

```
from socket import *
serverName = "127.0.0.1";

serverPort = 12000
clientSocket = socket(AF_INET, SOCK_DGRAM)
sentence = input("\nEnter file name: ")
clientSocket.sendto(bytes(sentence,"utf-8"),(serverName, serverPort))
filecontents,serverAddress = clientSocket.recvfrom(2048)
print ("\nReply from Server:\n")
print (filecontents.decode("utf-8"))
# for i in filecontents:
# print(str(i), end = '')
clientSocket.close()
clientSocket.close()
```



```
Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: C:\Users\admin\Desktop\1BM21CS179-ADA\ServerUDP.py =========
The server is ready to receive

Sent contents of  ServerUDP.py
```


IDLE Shell 3.11.5

File Edit Shell Debug Options Window Help

```
Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> 
========== RESTART: C:\Users\admin\Desktop\1BM21CS179-ADA\ClientUDP.py =========

Enter file name: ServerUDP.py

Reply from Server:

from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
    sentence, clientAddress = serverSocket.recvfrom(2048)
    sentence = sentence.decode("utf-8")
    file=open(sentence,"r")
    con=file.read(2048)
    serverSocket.sendto(bytes(con,"utf-8"),clientAddress)
    print ("\nSent contents of ", end = ' ')
    print (sentence)
    # for i in sentence:
    # print (str(i), end = '')
    file.close()

>>> 
```