Distributed and Parallel Computing Lab

CS461 Lab6

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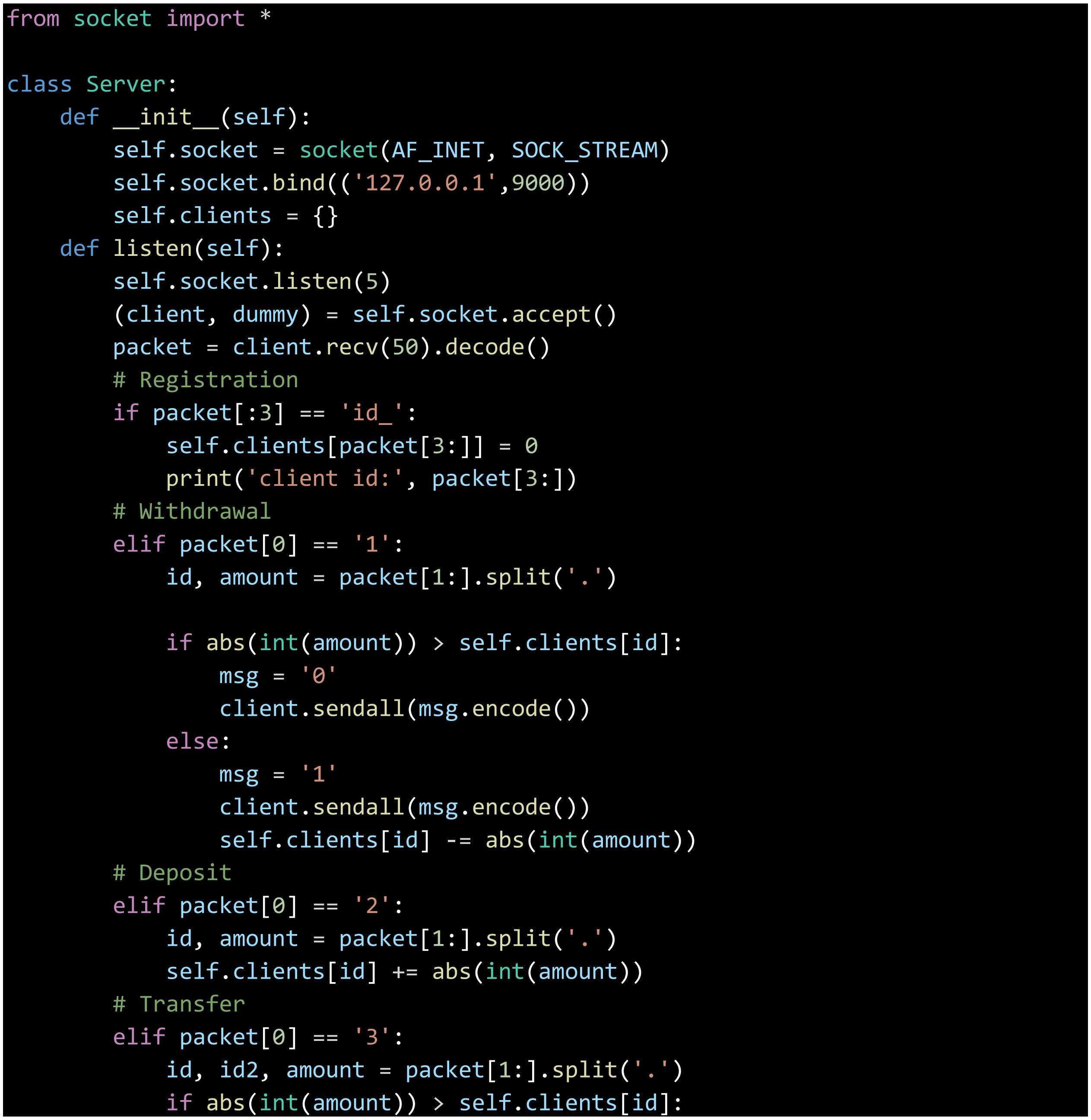
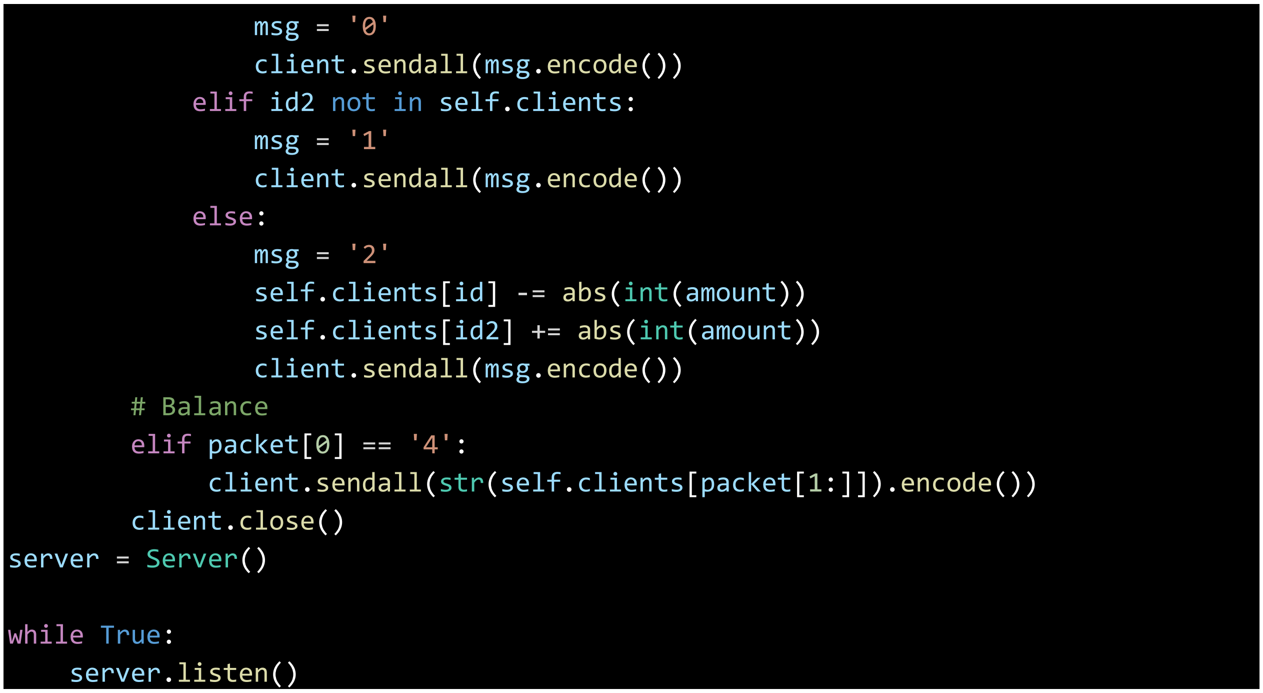
Task: Implementation of Distributed Banking Application.

IDE: VS Code Program Language: Python

Server Side:

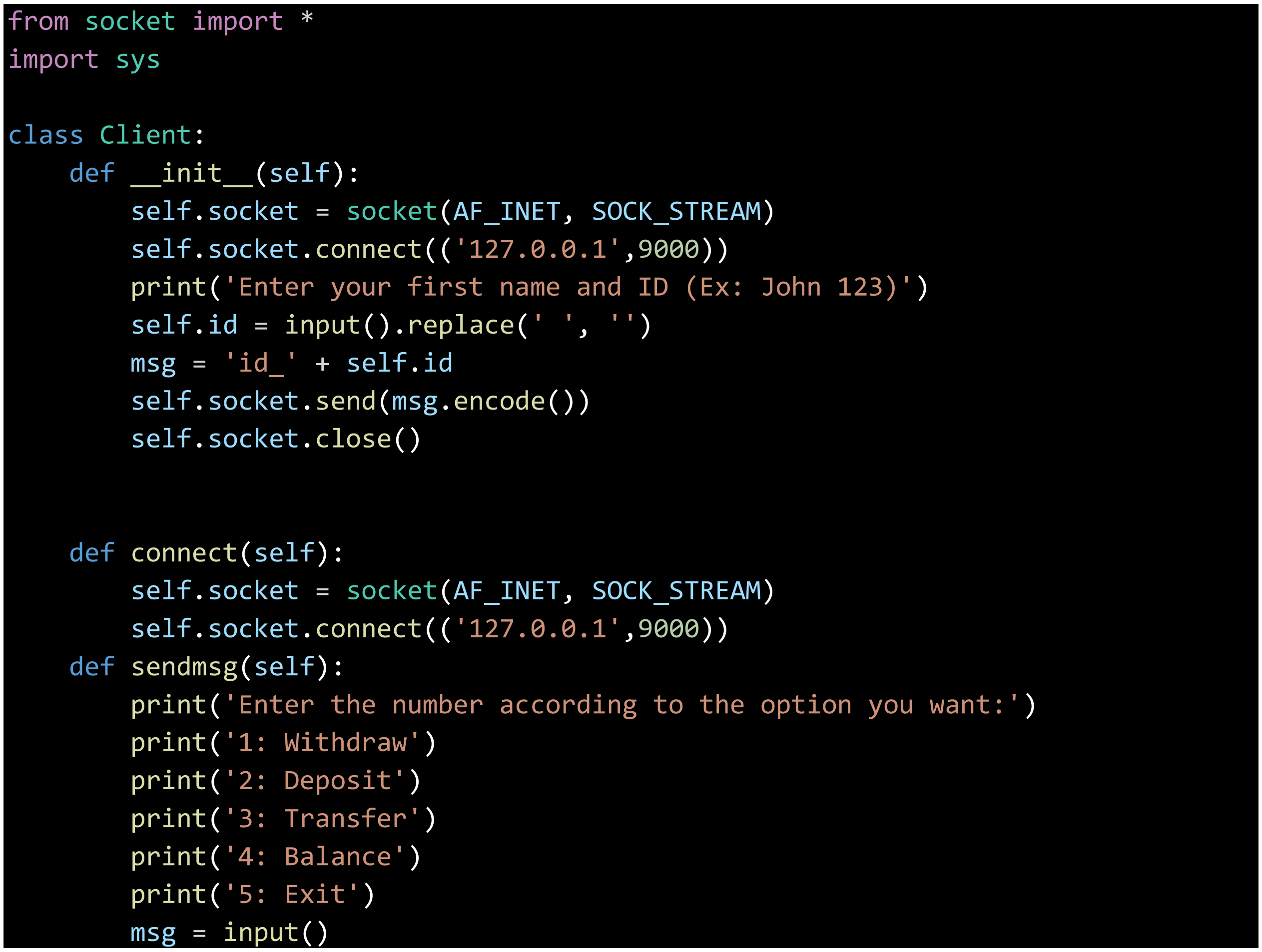


```
from socket import *

class Server:
    def __init__(self):
        self.socket = socket(AF_INET, SOCK_STREAM)
        self.socket.bind(('127.0.0.1',9000))
        self.clients = {}
    def listen(self):
        self.socket.listen(5)
        (client, dummy) = self.socket.accept()
        packet = client.recv(50).decode()
        # Registration
        if packet[:3] == 'id_':
            self.clients[packet[3:]] = 0
            print('client id:', packet[3:])
        # Withdrawal
        elif packet[0] == '1':
            id, amount = packet[1:].split('.')

            if abs(int(amount)) > self.clients[id]:
                msg = '0'
                client.sendall(msg.encode())
            else:
                msg = '1'
                client.sendall(msg.encode())
                self.clients[id] -= abs(int(amount))
        # Deposit
        elif packet[0] == '2':
            id, amount = packet[1:].split('.')
            self.clients[id] += abs(int(amount))
        # Transfer
        elif packet[0] == '3':
            id, id2, amount = packet[1:].split('.')
            if abs(int(amount)) > self.clients[id]:
```

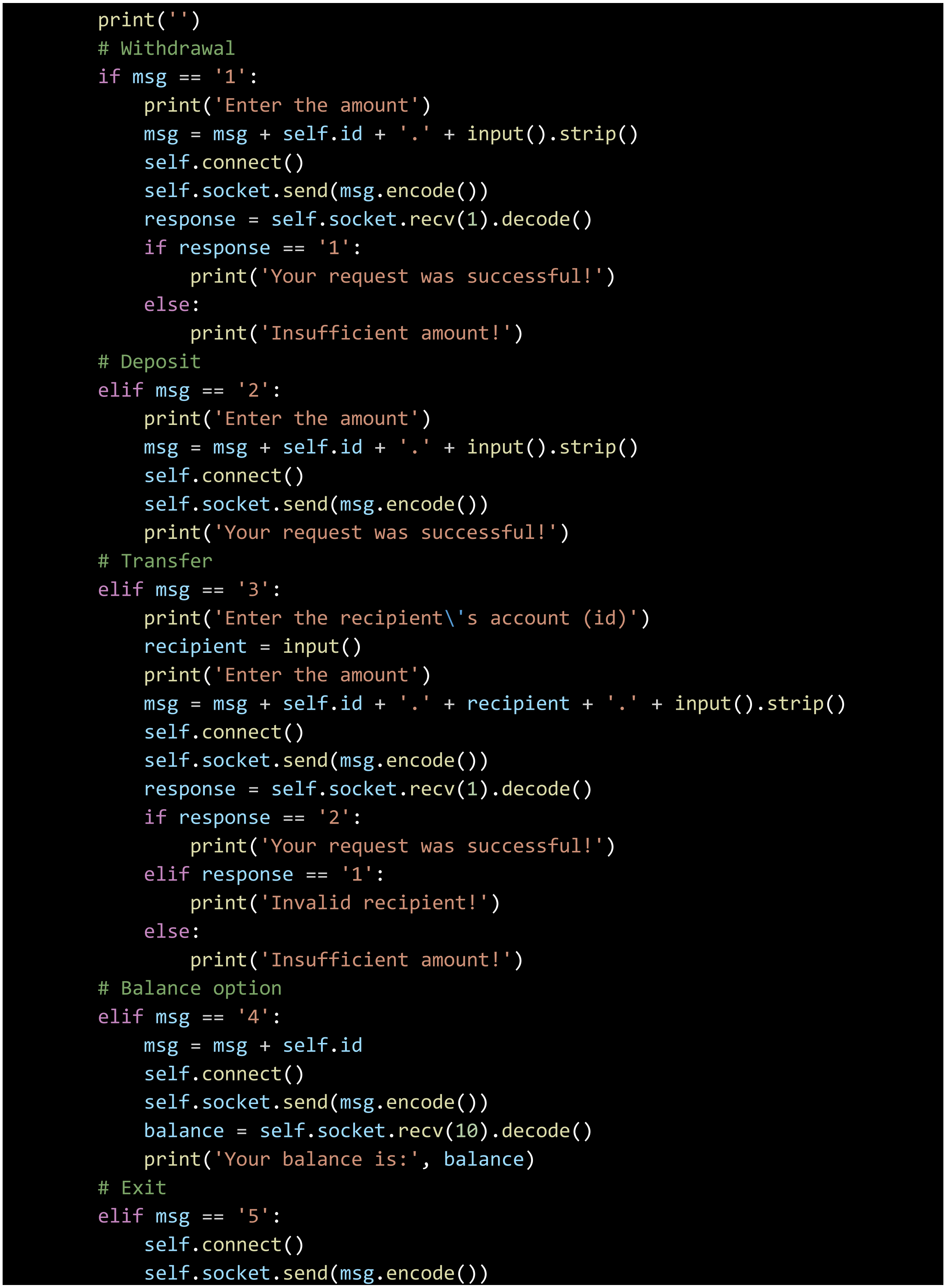


```
                msg = '0'
                client.sendall(msg.encode())
            elif id2 not in self.clients:
                msg = '1'
                client.sendall(msg.encode())
            else:
                msg = '2'
                self.clients[id] -= abs(int(amount))
                self.clients[id2] += abs(int(amount))
                client.sendall(msg.encode())
        # Balance
        elif packet[0] == '4':
             client.sendall(str(self.clients[packet[1:]]).encode())
        client.close()
server = Server()

while True:
    server.listen()
```

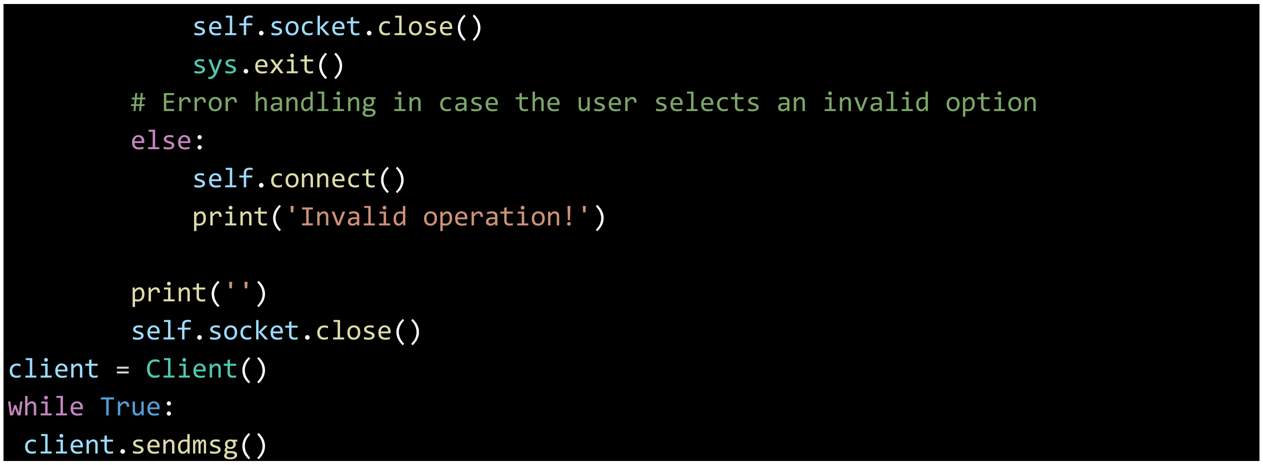
Client Side:



```
from socket import *
import sys

class Client:
    def __init__(self):
        self.socket = socket(AF_INET, SOCK_STREAM)
        self.socket.connect(('127.0.0.1',9000))
        print('Enter your first name and ID (Ex: John 123)')
        self.id = input().replace(' ', '')
        msg = 'id_' + self.id
        self.socket.send(msg.encode())
        self.socket.close()


    def connect(self):
        self.socket = socket(AF_INET, SOCK_STREAM)
        self.socket.connect(('127.0.0.1',9000))
    def sendmsg(self):
        print('Enter the number according to the option you want:')
        print('1: Withdraw')
        print('2: Deposit')
        print('3: Transfer')
        print('4: Balance')
        print('5: Exit')
        msg = input()
```



```
        print('')
        # Withdrawal
        if msg == '1':
            print('Enter the amount')
            msg = msg + self.id + '.' + input().strip()
            self.connect()
            self.socket.send(msg.encode())
            response = self.socket.recv(1).decode()
            if response == '1':
                print('Your request was successful!')
            else:
                print('Insufficient amount!')
        # Deposit
        elif msg == '2':
            print('Enter the amount')
            msg = msg + self.id + '.' + input().strip()
            self.connect()
            self.socket.send(msg.encode())
            print('Your request was successful!')
        # Transfer
        elif msg == '3':
            print('Enter the recipient\'s account (id)')
            recipient = input()
            print('Enter the amount')
            msg = msg + self.id + '.' + recipient + '.' + input().strip()
            self.connect()
            self.socket.send(msg.encode())
            response = self.socket.recv(1).decode()
            if response == '2':
                print('Your request was successful!')
            elif response == '1':
                print('Invalid recipient!')
            else:
                print('Insufficient amount!')
        # Balance option
        elif msg == '4':
            msg = msg + self.id
            self.connect()
            self.socket.send(msg.encode())
            balance = self.socket.recv(10).decode()
            print('Your balance is:', balance)
        # Exit
        elif msg == '5':
            self.connect()
            self.socket.send(msg.encode())
```



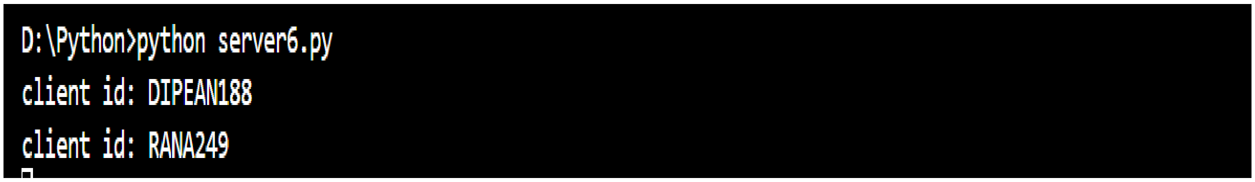
```
            self.socket.close()
            sys.exit()
        # Error handling in case the user selects an invalid option
        else:
            self.connect()
            print('Invalid operation!')

        print('')
        self.socket.close()
client = Client()
while True:
 client.sendmsg()
```

EXECUTION

First Server is run through command python server6.py

After server is up and running, run multiple clients through python client6.py.

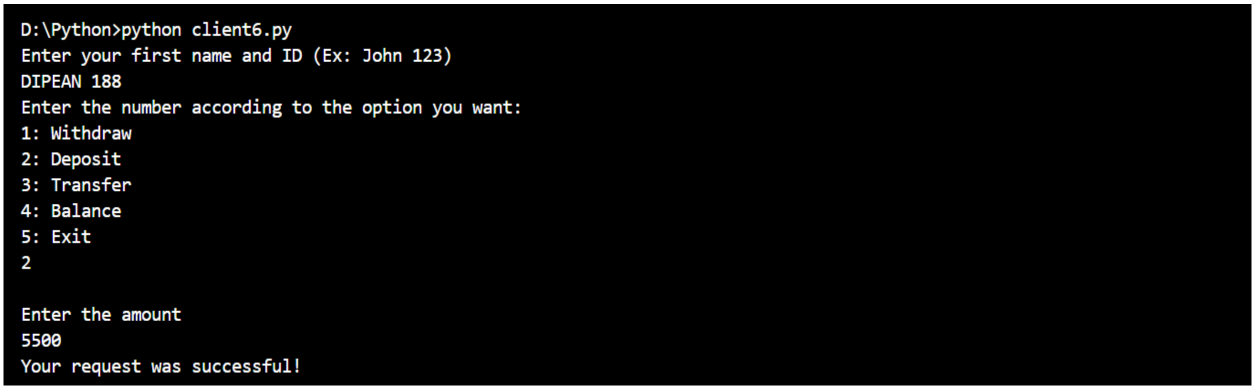
As, clients are initiated it gets listed in server side:



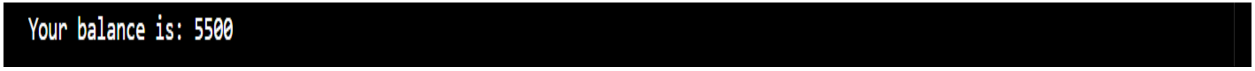
```
D:\Python>python server6.py
client id: DIPEAN188
client id: RANA249
```

OUTPUT

Case1: Deposit Amount

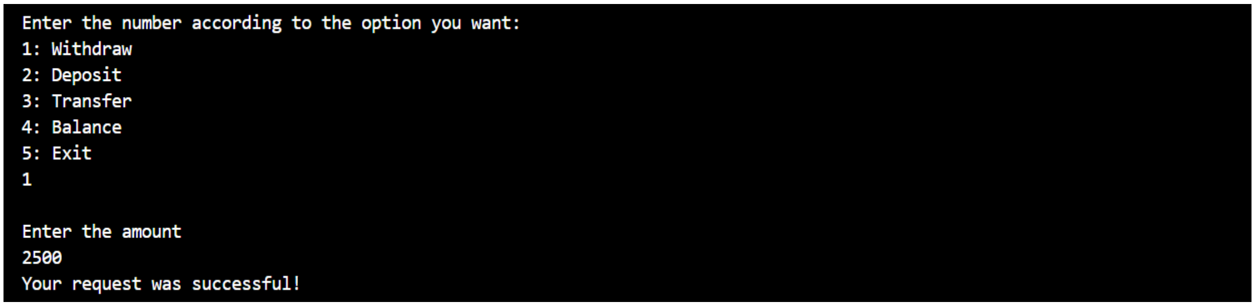


```
D:\Python>python client6.py
Enter your first name and ID (Ex: John 123)
DIPEAN 188
Enter the number according to the option you want:
1: Withdraw
2: Deposit
3: Transfer
4: Balance
5: Exit
2

Enter the amount
5500
Your request was successful!
```

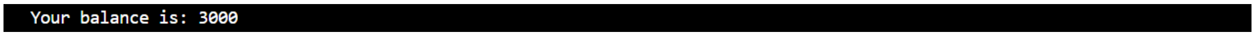


```
Your balance is: 5500
```

Case2: Withdraw amount



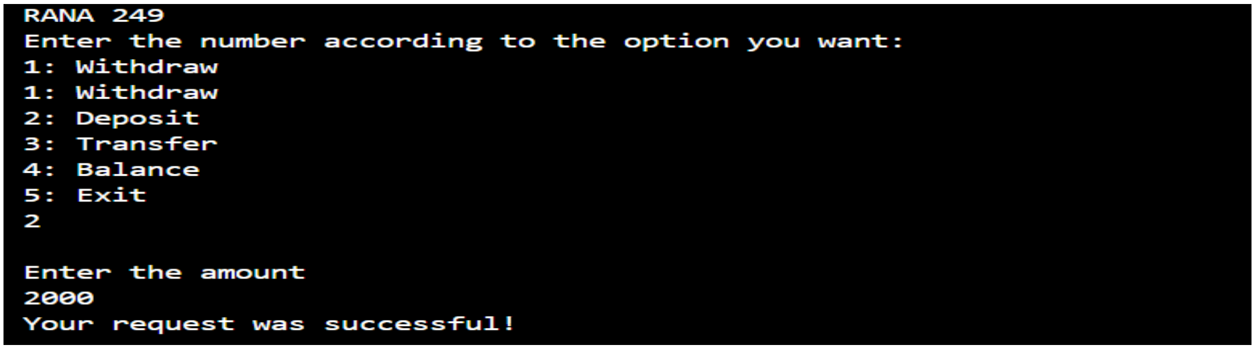
```
Enter the number according to the option you want:
1: Withdraw
2: Deposit
3: Transfer
4: Balance
5: Exit
1

Enter the amount
2500
Your request was successful!
```



```
 Your balance is: 3000
```

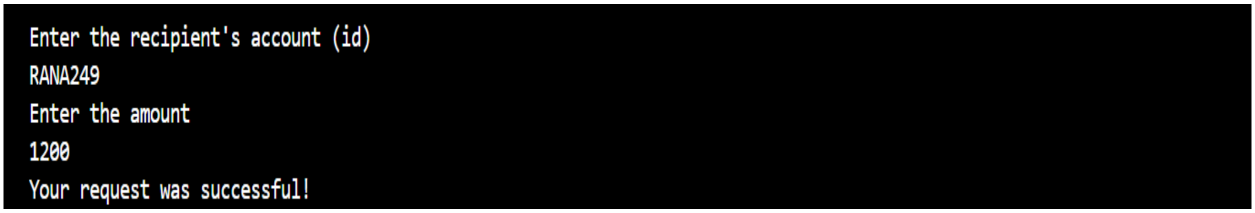
Case3: Amount transfer

For DIPEAN188 account amount in balance 3000. Lets send 1200 to RANA249 account.

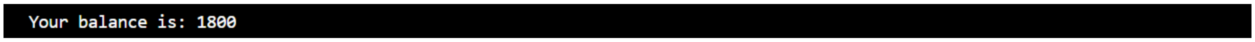


```
RANA 249
Enter the number according to the option you want:
1: Withdraw
1: Withdraw
2: Deposit
3: Transfer
4: Balance
5: Exit
2

Enter the amount
2000
Your request was successful!
```

Rana has already 2000 in his account.

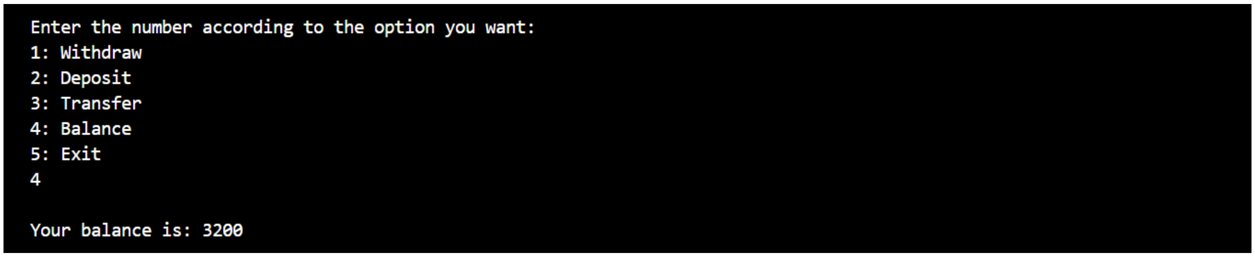


```
 Enter the recipient's account (id)
 RANA249
 Enter the amount
 1200
 Your request was successful!
```



```
 Your balance is: 1800
```

Transfer is successful; Dipean’s new balance is 1800; after transferring 1200 to Rana.



```
 Enter the number according to the option you want:
 1: Withdraw
 2: Deposit
 3: Transfer
 4: Balance
 5: Exit
 4

 Your balance is: 3200
```

Rana s account balance is now 3200 after 1200 transfer from Dipean.

-----------------------------END OF ASSIGNMENT--------------------------------