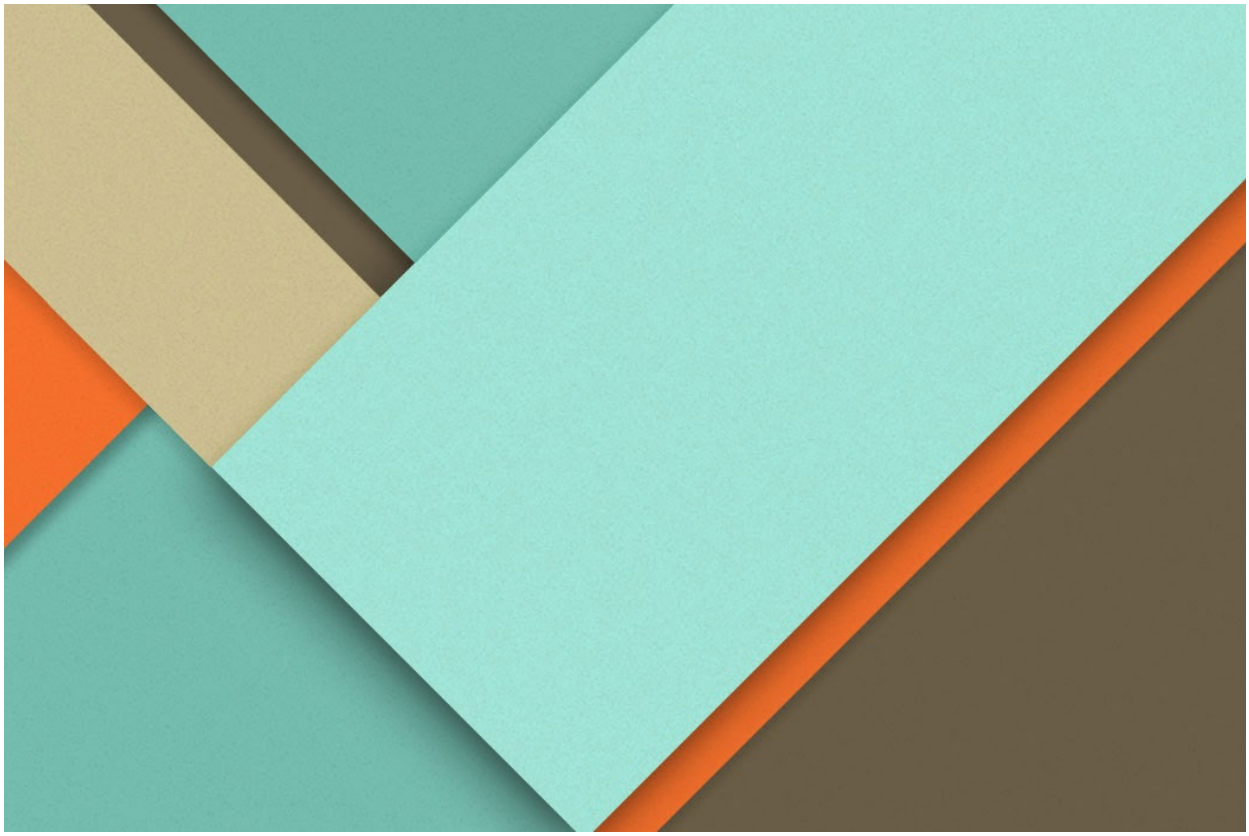


Assignment I

—

Sadrul Alam Molla
Jadavpur University
001710501012

Overview

Implementing a TCP-based key-value store.The server implements the key-value store and clients make use of it. The server accept clients' connections and serve their requests for 'get' and 'put' key value pairs.All key-value pairs are stored by the server only in memory. Keys and values are strings.

The client accepts a variable no of command line arguments where the first argument is the server hostname followed by port no. It's followed by any sequence of "get <key>" and/or "put <key> <value>".

The server is running on a TCP port. The server supports multiple clients and maintain their key-value stores separately.

Implementation

- Created two array auth_dict and key_store.auth_dict to store what kind of authorization the client has.
- Key_store is a 2d array where kye_store[i] save the key_value of the ith client.
- All the auth_dict is by default "guest".
- When server gets a message from any client ,if it's a put it save the key value pair otherwise it search for the key and return the value(if present).
- If the auth is guest it will check for that particular client but if it's a manager search the key in all the client.

Code

Client.py

```
import socket
from sys import argv
import time

class client():
	def __init__(self):
		try:
			self.serverhost = argv[1]
			self.serverport = int(argv[2])
		except:
			print("ERROR: Please Enter The serverhost & serverport!!!")
			exit(0)
	def query(self, args):
		#creating the socket
		s= socket.socket(socket.AF_INET, socket.SOCK_STREAM)
		#connecting with the server
		s.connect((self.serverhost,self.serverport))
		print("client is ready to send....")
		for i in args:
			#sleep time between sending the data
			time.sleep(.07)
			#sending data to the server
			s.send(i.encode())
		time.sleep(.07)
		s.send("end".encode())
		#getting the value for the key
		print("client is Listing....")
		Ans=s.recv(1024).decode()
```

```
            while True:
                if(Ans=="end"):
                    break
                print(Ans)
                Ans=s.recv(1024).decode()
            s.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)


c=client()
client_no=argv[3]
c.query(argv)
```

Server.py

```
import socket
from sys import argv
import time

class Server():
    def __init__(self):
        self.serverhost = '127.0.0.1'
        self.serverport = 8004
        self.max_client = 45
        self.auth_dict = {}
        self.key_store = {}

    def initilize(self):
        for i in range(1,self.max_client+1):
            self.auth_dict[i] = "guest"
            self.key_store[i] = {}
    def query(self):
        while True:
            res=input("Want To Continue : ")
```

```
                    if(res=='N' or res=='n'):
                        break
                    while True:
                        res=input('Want to Change The authorization to any Client(y/n)
: ')
                        if(res=="y" or res=="Y"):
                            client_no,auth=input('Enter The Client No and
authorization type : ').split()
                            self.auth_dict[int(client_no)]=auth
                            print('Client '+client_no+'is now a '+auth+'!!!')
                        else:
                            break
                    #creating sock
                    sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
                    sock.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)
                    #binding with the client
                    sock.bind((self.serverhost,self.serverport))
                    sock.listen(1)
                    conn = sock.accept()

                    save_value=[]
                    reciver=[]
                    flag=False
                    data = conn[0].recv(1024).decode()
                    while data:
                        print(data)
                        if(data=="end"):
                            break
                        save_value.append(data)
                        #print(data, end=',')
                        data = conn[0].recv(1024).decode()

                    slen = len(save_value)
```

```
                client_no=int(save_value[3])
                i=4

                for i in range(slen):
                        if(save_value[i]=='get'):
                                try:
                                        if save_value[i+1] in self.key_store[client_no]:
                                                print("Value For the Key "+
save_value[i+1]+" been found")

reciver.append(self.key_store[client_no][save_value[i+1]])
                                        elif self.auth_dict[client_no] == 'manager':
                                                flag=False
                                                for j in range(1,self.max_client+1):
                                                        if save_value[i+1] in
self.key_store[j]:
                                                                print("Value For the Key "+
save_value[i+1]+" been found")

reciver.append(self.key_store[j][save_value[i+1]])
                                                                flag=True
                                                                break
                                                if(flag==False):
                                                        print("Value For the Key "+
save_value[i+1]+" not been found")
                                                        reciver.append("<blank>")
                                        else:
                                                print("Value For the Key "+
save_value[i+1]+" not been found")
                                                reciver.append("<blank>")
                                except:
                                        print("INVALID GET REQUEST!!")
                        elif(save_value[i]=='put'):
                                try:
                                        key=save_value[i+1]
```

```
                                        value=save_value[i+2]
                                        i=i+2
                                        while i+1<slen:
                                                if(save_value[i+1]=='put' or
save_value[i+1]=='get'):
                                                        break
                                                value+=(" "+save_value[i+1])
                                                i+=1
                                        self.key_store[client_no][key]=value
                                        print("Value For the Key "+ key+" been saved")
                                except:
                                        print('INVALID PUT REQUEST!!')
                        for x in reciver:
                                time.sleep(.07)
                                conn[0].send(x.encode())
                        time.sleep(.07)
                        conn[0].send("end".encode())
                        conn[0].setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)

s = Server()
s.initilize()
s.query()
```

OutPut

Server:

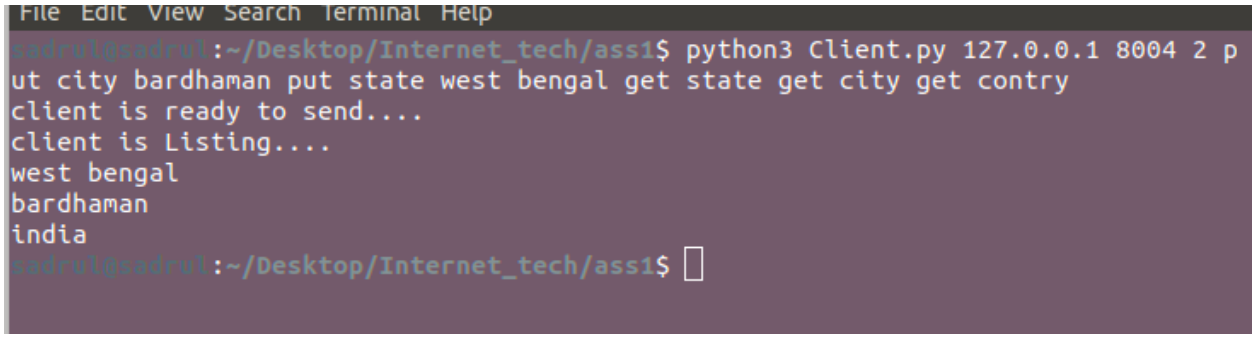
```
File  Edit  View  Search  Terminal  Help
Want To Continue : y
Want to Change The authorization to any Client(y/n) : y
Enter The Client No and authorization type : 2 manager
Client 2is now a manager!!!
Want to Change The authorization to any Client(y/n) : n
Client.py
127.0.0.1
8004
1
put
city
kolkata
put
contry
india
get
contry
get
city
get
institute
end
Value For the Key city been saved
Value For the Key contry been saved
```

```
File  Edit  View  Search  Terminal  Help
Value For the Key contry been found
Value For the Key city been found
Value For the Key institute not been found
Want To Continue : y
Want to Change The authorization to any Client(y/n) : n
Client.py
127.0.0.1
8004
2
```

```
File  Edit  View  Search  Terminal  Help
127.0.0.1
8004
2
put
city
bardhaman
put
state
west
bengal
get
state
get
city
get
contry
end
Value For the Key city been saved
Value For the Key state been saved
Value For the Key state been found
Value For the Key city been found
Value For the Key contry been found
Want To Continue : n
```

Clients:

```
<blank>
sadrul@sadrul:~/Desktop/Internet_tech/ass1$ python3 Client.py 127.0.0.1 8004 1 p
ut city kolkata put contry india get contry get city get institute
client is ready to send....
client is Listing....
india
kolkata
<blank>
sadrul@sadrul:~/Desktop/Internet_tech/ass1$
```


File Edit View Search Terminal Help
sadrul@sadrul:~/Desktop/Internet_tech/ass1$ python3 Client.py 127.0.0.1 8004 2 p
ut city bardhaman put state west bengal get state get city get contry
client is ready to send....
client is Listing....
west bengal
bardhaman
india
sadrul@sadrul:~/Desktop/Internet_tech/ass1$