Mohiuddin Mondal
Roll- 001910501043 (A2)
Internet Technology
3rd year 2st Sem BCSE UG
Assignment 1

Problem statement: Implement a key-value storeusing socket programming. The server implements the key-value store and clients make use of it. The server must accept clients' connections and serve their requests for 'get' and 'put' key value pairs. All key-value pairs should be stored by the server only in memory. Keys and values are strings.

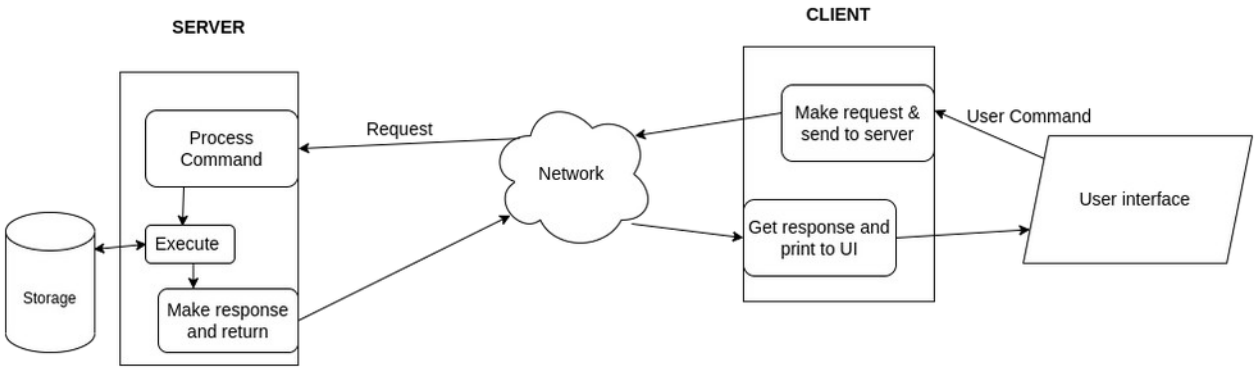
Description: The client accepts a variable no of command line arguments where the first argument is the server hostname followed by port no. It shouldbe followed by any sequence of "get <key>" and/or "put <key> <value>"
../client 192.168.124.5 5555 put city Kolkata put country India get country get city get Institute
India
Kolkata
<blank>
The server should be running on a designated port no. The server should support multiple clients and maintain their key-value stores separately.Comment on theport nos used by the server and the clients.Implement authorization so that onlyafew clients having the role "manager" can access other's key-value stores. A user is assigned the "guest" role by default. The server can upgrade a "guest" user to a "manager" user.

Design: A simple client and server model is implemented here. Server listens on port 8000 and clients connects to it. Client takes command from user and sends it to the server. Server process the command and returns a response to the client. Client prints the response and waits fo the next command. They are implemented using Java and server can handle multiple client at the same time.

Input/Output : Simple string is sent as data. There format at byte level is handled by JAVA APIs. Client always sends a single line of command but server response may contain multiple lines.

- Server alows following commands:
  - GET – takes a key string as arguement
  - PUT – takes a key and a value as arguement
  - MANAGER – takes a password string as arguement
  - OTHERS – No arguement required, but user must be authorised before using it through MANAGER command
  - VIEW – takes user-id as arguement and returns all the key-value pair of that user's store. Again, user must be authorised to use this command.

Diagram:



Implementation:

Simple code snippet is provided below:

KeyStoreServer:

```
 ServerSocket _server = new ServerSocket(8000);
System.out.println("started server at port: 8000");

while(true){
    Socket client = _server.accept();
    System.out.printf("Accepted connection from:%d\n",client.getPort());

    ServerHandler _handler = new ServerHandler(client,storage);
    Thread _t = new Thread(_handler);
    _t.start();
}
```

FTPClient:

```
 System.out.print("remote> ");
    String command = scanner.nextLine();
    request.writeUTF(command);
    // request.flush();

    System.out.println(response.readUTF());

    System.out.println();
```

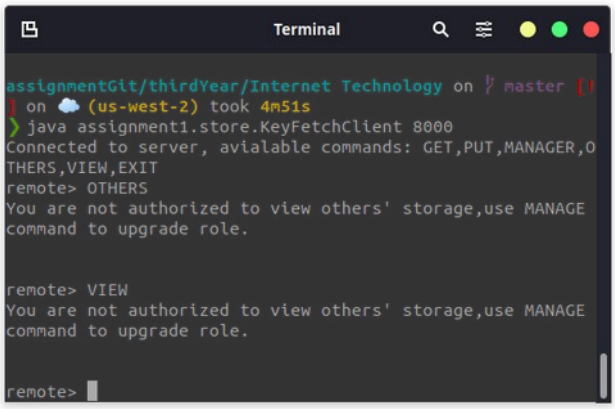
Test cases:

This program is tested through running the server and two different clients, one is in guest mode, another is in manager mode. Result is shown below.

Reuslts and Analysis:

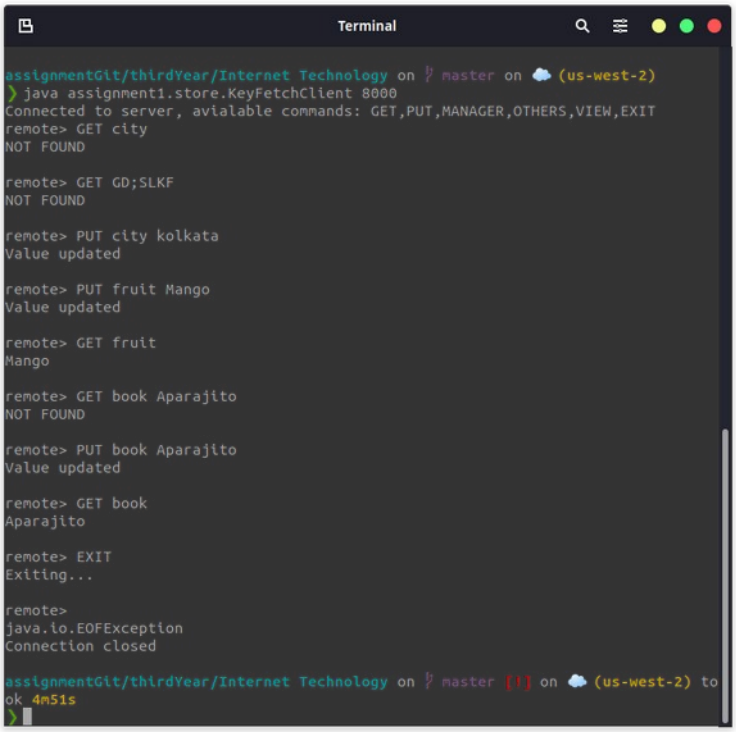
Results:

Following screenshot shows the interaction between client and server. Left terminal shows the client side:

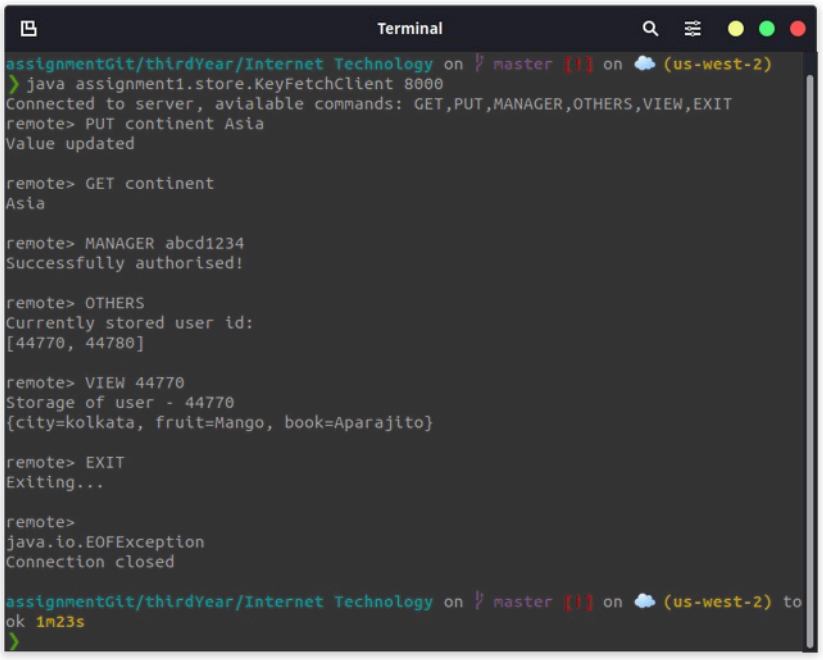


It shows authorisation error in clent

Servere side logs (handling two client simultaneously)



An user in guest mode.



An user in manager mode