

SDI

## Assignment : 2.

Title : Socket Programming.

Problem Statement : Enhance the system with the help of socket programming use client and server architecture. Develop a chat server.

Objective :

- 1) To understand and learn the basics and advanced techniques of socket based client and server programming.
- 2) To understand java packages
- 3) To understand TCP / UDP client server application development.

Outcome :

- 1) Design and implement socket programming in JAVA
- 2) Implement TCP / UDP client server socket based application, using java.net package of JAVA.

S/W Packages & Hardware :

- 1) Java SE Development Kit 8.
- 2) Operating system (Windows).
- 3) Code Editor eclipse / VScode.

Theory : Java.net \*

It contains key classes and interfaces which are used for socket programming.

TCP / IP socket programming.

If we are creating between client and server using TCP then it has few functionality like, TCP is suited for application that requires high reliability, and transmission time is relatively less critical. It is used by other protocols like HTTP, HTTPS, FTP, SMTP, Telnet, TCP rearranges data packets in the order specified.

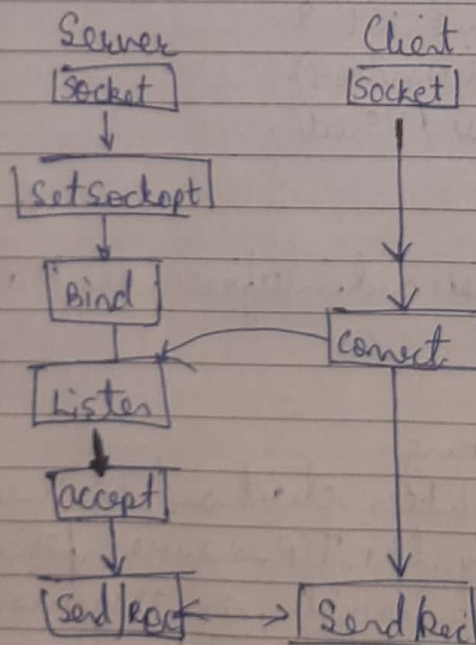
There is absolute guarantee that the data transferred remains intact and arrives in the same order in which it was sent. TCP does flow control and requires three packets to set up socket connection before any user data can be sent. TCP handles reliability and congestion control. It also does error checking and error recovery. Erroneous packets are retransmitted from source to destination.

### TCP server -

- 1) using `create()`, create TCP socket
- 2) using `bind()`, Bind the socket to server address.
- 3) using `listen()`, put the server socket in a passive mode, where it waits for the client to approach server to make a connection
- 4) using `accept()`. At this point connection is established between client and server, & ready to transfer data
- 5) go to step 3.

### TCP client:

- 1) Create TCP socket
- 2) connect newly created client socket to server.





## UDP socket programming:

In UDP, client does not form a connection with server like in TCP and insteads just send a datagram. Similarly the server need not accept a connection & just waits for datagrams to arrive. Datagram upon arrival contain the address of sender of which the sender uses to send data to the correct client.

### UDP server:

- 1) Create UDP socket.
- 2) Bind the socket to server address.
- 3) Wait until datagram packet arrives from client.
- 4) process the datagram packet and send reply to client.
- 5) Go to step 3

### UDP client:

- 1) Create UDP socket
- 2) Send message to server.
- 3) Wait until response from server is received.
- 4) Process reply & go to step 2.
- 5) Close socket and exit.

### Conclusion:

We were able to implement TCP/IP socket programming in the restaurant Management system.

```
File Edit Selection View Go Run ... Login.java - Assignment 2 Client - Visual Stu...
TERMINAL PROBLEMS 65 OUTPUT DEBUG CONSOLE 1: Java Process Console
WE NEED TO CONFIRM THAT YOU ARE A PART OF RESTAURENT

LOGIN
Enter username : admin
Enter password: password

Logged in successfully

8
MENU
1. VIEW USERS
2. VIEW MENU
3. ADD NEW DISH
4. ADD ORDER
5. ORDERS HISTORY
6. VIEW ORDER
7. Logout
8. Chat with Server

Enter your choice : 1
2

Users
1. admin
2. user

MENU
1. VIEW USERS
2. VIEW MENU
3. ADD NEW DISH
4. ADD ORDER
5. ORDERS HISTORY
6. VIEW ORDER
7. Logout
8. Chat with Server

Enter your choice : 2
#####
MENU
#####
SIZZLER
```

```
File Edit Selection View Go Run ... MainServer.java - Assignment 2 Server - Visual ...
TERMINAL PROBLEMS 48 OUTPUT DEBUG CONSOLE 2: Java Process Console
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Login Attempted from client
Login Successful
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request Order History from client
Order History request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for all users from client
All Users request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
[]
```

```
File Edit Selection View Go Run ... Login.java - Assignment 2 Client - Visual Stu...
TERMINAL PROBLEMS 65 OUTPUT DEBUG CONSOLE 1: Java Process Console
#####
MENU
#####
SIZZLER
#####
ID NAME PRICE
kB6pZ6 Veg Tawa Sizzler - Rs. 600.0
bM4yD5 Veg Ala Kiev Sizzler - Rs. 600.0
tI3yV4 Soya Chaap Sizzler - Rs. 650.0
bE4vE1 Cheese Cutlet Sizzler - Rs. 600.0
#####
SOUP
#####
ID NAME PRICE
dT6tY2 Tomato Soup - Rs. 80.0
yC5qK7 Palak Soup - Rs. 80.0
n08jh1 Manchaw Soup - Rs. 95.0
qS7cV8 Sweet Corn Soup - Rs. 95.0
#####
```

```
File Edit Selection View Go Run ... MainServer.java - Assignment 2 Server - Visual ...
TERMINAL PROBLEMS 48 OUTPUT DEBUG CONSOLE 2: Java Process Console
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Login Attempted from client
Login Successful
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request Order History from client
Order History request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for all users from client
All Users request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
[]
```

```
File Edit Selection View Go Run ... Login.java - Assignment 2 Client - Visual Stu...
TERMINAL PROBLEMS 65 OUTPUT DEBUG CONSOLE 1: Java Process Console
Enter your choice : 4
MAKE ORDER
1. Add Item
2. Remove Item
3. See the Order
4. Place Order
5. Exit
Enter your choice : 1
ENTER THE ID OF THE ITEM :
hZ9gR4
ENTER THE QUANTITY :
10
ITEM HAS BEEN ADDED TO THE MENU

MAKE ORDER
1. Add Item
2. Remove Item
3. See the Order
4. Place Order
5. Exit
Enter your choice : 3

Order ID: 877908

hZ9gR4 Fresh Lime Juice          10 x Rs 50.000000

Total Amount                    = Rs 500.000000

MAKE ORDER
1. Add Item
2. Remove Item
3. See the Order
4. Place Order
5. Exit
Enter your choice : 4
ENTER YOUR NAME :Pradyumna
ENTER YOUR PHONE NUMBER : 9960716253
ARE YOU SURE YOU WANT TO PLACE THE ORDER? (Y/N)
Y
TOTAL AMOUNT OF YOUR ORDER IS 500.0

YOUR ORDER ID IS 877908

ORDER HAS BEEN PLACED.
```

```
File Edit Selection View Go Run ... MainServer.java - Assignment 2 Server - Visual ...
TERMINAL PROBLEMS 48 OUTPUT DEBUG CONSOLE 2: Java Process Console
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request Order History from client
Order History request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for all users from client
All Users request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request Place Order from client
Place Order request completed
Waiting For Client connection for Menu ...
[]
```

```
File Edit Selection View Go Run ... Login.java - Assignment 2 Client - Visual Stu...
TERMINAL PROBLEMS 65 OUTPUT DEBUG CONSOLE 1: Java Process Console + - x
Y
TOTAL AMOUNT OF YOUR ORDER IS 500.0

YOUR ORDER ID IS 877908

ORDER HAS BEEN PLACED.

MAKE ORDER
1. Add Item
2. Remove Item
3. See the Order
4. Place Order
5. Exit
Enter your choice : 5
MENU
1. VIEW USERS
2. VIEW MENU
3. ADD NEW DISH
4. ADD ORDER
5. ORDERS HISTORY
6. VIEW ORDER
7. Logout
8. Chat With Server

Enter your choice : 8
Chat With Server (Use 'EXIT' to close)
[Client] Your Message :Hey Server
Waiting for server response..
[Server] Message : Hi client
[Client] Your Message :Is order 877908 ready ?
Waiting for server response..
[Server] Message : Yes it is
[Client] Your Message :EXIT
You have closed connection ...
MENU
1. VIEW USERS
2. VIEW MENU
3. ADD NEW DISH
4. ADD ORDER
5. ORDERS HISTORY
6. VIEW ORDER
7. Logout
8. Chat With Server
Enter your choice : |
```

```
File Edit Selection View Go Run ... MainServer.java - Assignment 2 Server - Visual ...
TERMINAL PROBLEMS 48 OUTPUT DEBUG CONSOLE 2: Java Process Console + - x
Request Order History from client
Order History request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for all users from client
All Users request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request for Food Menu from client
Food Menu request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Request Place Order from client
Place Order request completed
Waiting For Client connection for Menu ...
Connection between Client And Server established for Menu...
Chat Box Request received

[Client] Message : Hey Server
[Server] Your Message : Hi client
Waiting for client response..
[Client] Message : Is order 877908 ready ?
[Server] Your Message : Yes it is
Waiting for client response..
[Client] Message : EXIT
Client has closed connection ...
Waiting For Client connection for Menu ...
|
```