SUMMARY

Group Members:

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**Project Description**

The project is about implementing sockets to demonstrate a Client/Server model which communicate with each other using messages. The communication is established using sockets. A socket is one end-point of a two-way communication link between two programs running on the network or simply saying Socket classes are used to represent the connection between a client program and a server program. We have used Java language for this project and the java.net package in the Java development environment provides a class ”Socket” that represents one end of a two-way connection between our Java program and another program on the network.

Client and server are sharing information after the client connects with the server by giving host name and port number where server accepts the connection. Client has to provide the User name which is required by server to identify the users and create a thread for this client. A new thread is created for each client. Then a menu list is presented to the user where they can select the information they want to know or share with server. Server is supporting multiple different clients at the same time using threads. User/Client can communicate with other users also indirectly by sending information/messages to server and then server performs the required task.

Professor’s example code (provided for project 3) was taken as a base and then required operations were added. Two different java files are created each for client side and server side. Operations or information to be shared by client using sockets is added in communication method of socket class and information sharing which server handles is added in the run method of the client thread created by the server.

Project was tested and run on local server as well as csgrads1.utdallas.edu server.

**Project Experience**

This is our first project on Sockets and to model Client/Server communications. Creating and understanding sockets was easy and after looking at professors code, the concepts and basics of sockets was clear. We had clear understanding what we have to do to create Server side and client side. Threading was used to create any number of instances of server to handle and communicate with any number of clients. There is one thread for each client.

We faced some challenges during the project like –

* The communication between client and server was done easily using socket but for server to interact/communicate with multiple clients we were facing issues since we had to handle multiple requests from a client and it had to be in sync with the server which is also handling other client requests
* There were challenges to debug and analyze while testing the program with multiple clients since multiple threads were running on the server
* We faced an issue to print the proper order of information as given in the project description (sample output). Then we analyzed the code and checked for print statements as per the order of communication (synchronization) between client and server
* There were parsing issues we faced while printing the output as per the project sample output description which we handled by checking each shared information/data between client and server.

The future scope for the project can be to make a GUI for client side and server side where user can input the information through GUI which would be more interactive. Also in future we can implement the same project with more than one Server.

Overall the project was a great learning experience where we learned about the sockets, how to use them for communications or information sharing between two programs and lot of other new things. We successfully implemented the client/server model which is being used by almost every website, application or IT solution. The interesting part of the project is communicating and information sharing between two different machines.

**Contribution from Group Members**

We divided the project work evenly and both team mates were required to complete their part within the deadlines we discussed and set. The tasks assigned to members were:

* Himanshu Parashar
* Build the client side and write its code as per the Project description
* Check and correct the Server side code by understanding the code structure
* Test with different inputs, order of execution and boundary cases and testing on university server (csgrads1.utdallas.edu server).
* Run the Project with multiple clients and check the output
* Write project report, summary and design
* Code Design and development
* Satwant Singh
  + Build the server side and write its code as per the project description
  + Check and validate the client side code
  + Testing on local host
  + Design and development
  + Debugging and optimization
  + Contribution to project report writing and review.

We both sat down together and discussed each and every challenge we faced to tackle it and came up with an appropriate solution.