Frankfurt University Of Applied Sciences

– Fachbereich Informatik –

Chat Application in Two-Layers-Architectur

Object-Oriented-Programming Java Advance

Bachelor of Science (B.Sc.)

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Frankfurt am Main, 14. Juli 2022

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We have seen that computer programming is an art,
because it applies accumulated knowledge to the world,
because it requires skill and ingenuity, and especially
because it produces objects of beauty.

— Donald E. Knuth [Knu74]

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Put your acknowledgments here.

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1 Members of GuIT (Gruppo Italiano Utilizzatori di TeX e LaTeX)

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LIST OF ABBREVIATIONS

INTRODUCTION

1 THEORY

1.1 JAVA

Java is one of the most popular programming language.It is develop by Oracle Corportation in May 23, 1995. It is also used to develop mobile apps, web apps, desktop apps, games and much more. It has helped to reduce costs, shortens development timeframes, drive innovation, and improve application services.

There are five primary goals in the creation of the Java language.

- It must be simple, object-oriented, and familiar.
- It must be robust and secure.
- It must be architecture-neutral and portable.
- It must be interpreted, threaded and dynamic.

1.2 THREAD

A thread of execution is the smallest sequence of programmed instructions that can be managed independently by a scheduler, which is typically a part of the operating system. The implementation of threads and processes differs between operating systems,but in most cases a thread is a component of a process. The multiple threads of a given process may be executed concurrently *viamultithreadingcapabilities*, sharing resources such as memory, while different processes do not share these resources.

A thread is a thread of execution in a program. The Java Virtual Machine allows an application to have multiple threads of execution running concurrently. Every thread has a priority. Threads with higher priority are executed in preference to threads with lower priority.

1.3 GIT

Git is an open source distributed version control system, mainly used for source code management, with an emphasis on speed. Git was initially designed and created by Linus Torvalds for Linux kernel development. Git operates on a decentralized architecture, so every Git working directory is a full-fledged repository with a complete history and full revision-tracking capabilities, and is not dependent upon network access or a central server. Unlike popular non-distributed predecessors, such as Subversion and CVS, Git only needs a central server for one thing: publishing changes to users of that server. You can equally share changes directly with other people without the need to consult a central hub.

1.4 GITLAB

GitLab Inc. is an open-core company that provides GitLab, a DevOps software package that combines the ability to develop,secure, and operate software in a single application. The open source software project was created by Ukrainian developer Dmitriy Zaporozhets and Dutch developer Sytse Sijbrandij. Since its founding, GitLab Inc. has been centered around remote work. GitLab has an estimated 30 million registered users, with 1 million being active licensed users.

1.5 PROJECT

A project is well-defined task, which is a collection of several operations done in order to achieve a goal $forexample, softwaredevelopmentanddelivery$.

A Project can be characterized as:

- Every project may has a unique and distinct goal.
- Project is not routine activity or day-to-day operations.
- Project comes with a start time and end time.
- Project ends when its goal is achieved hence it is a temporary phase in the lifetime of an organization.
- Project needs adequate resources in terms of time, manpower, finance, material and knowledge-bank.

A software Project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.

2 IMPLEMENTATION

2.1 PROBLEM

Forward the message to the specified client. With the help of java suckt it is possible to establish a connection between the server and a client. Through this connection the client and the server can communicate with each other. The client can send a message to the server, and the server can also reply to the client and send retransmissions.

The difficulty is that the client sends the messages to the other client. In this case, the message must be sent from the first client to the server, and then the messages must be forwarded from the server to the correct client. After that, the other client must send the response back to the first client via the server.

2.2 SOLUTION

After a lot of thinking, a solution was found to use the Thread class. The thread class must be implemented for client and server, so that the server receives the messages from the first client and at the same time forwards them to the right client and vice Versa. the thread for the client starts to call the method onReceive as rekrusion so that the client is always ready to receive the messages

2.3 SERVER GUI

In the server mask you can enter a server with its IP address and port (As default 127.0.0.1:8080) and then click the Start server button to start the server. When the server is started, two tables will display all connected clients and all created groups, respectively. If you click on the Client tab, a table with the following columns will be displayed (checked, username, host, port). The column with the check boxes are used to select the clients to be deleted. After the clients are selected, you should click the "Delete" button under the table. The "Groups" table has less columns than the "Clients" table, namely (Check, Name of the group, count of clients) The "Check" column has the same principle of operation as in the "Clients " table, the groups can be selected to be deleted. when a client is deleted, a message is sent to all other clients with the content (the client is deleted with server). This message (the Group is deleted with serve) is also sent for all clients when a group is deleted. If you want to stop the server, it must click on the "Stop" button at the top of the mask. when you want to close the server application, click on File –>Exit.

3 IMPROVEMENT

BIBLIOGRAPHY

[Knu74] Donald E. Knuth. "Computer Programming as an Art." In: *Communications of the ACM* 17.12 (1974), pp. 667–673.