



Bilkent University Department of Computer Engineering

# CS 319 Object - Oriented Software Engineering Project

*Mafia:TCoS - Mafia:TheCity of Sin*

## Final Report

## Project Group 2.A:

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## 1. Implementation Flow

Implementation phase of the *Mafia: TCoS* was started by dividing the workload among the group members. For the fairness of the work load, we tried to assign half of the subsystems to a pair. Since, we chose client-server architectural style with MVC pattern in front-end, we started the implementation process with the basics of View, Model(Player) and Network subsystems aiming to build the skeleton of our project. This process required further research into server(RESTful Web Service) implementation with **Node.js** and UI Design with the wholly modern **JavaFX**. After implementing the basics of UI and Network, these subsystems were completed and tested individually regarding the *Dependency Injection* rules. When we decided that all the essential components were developed sufficiently, the implementation process of Controller and Model subsystems were started. Since these subsystems are closely related, their implementation phase required working as a whole group. Despite the fact that we mostly worked in pair for the sake of the development process, our group work also involved tight communication via virtual meeting using Slack and Google Docs.

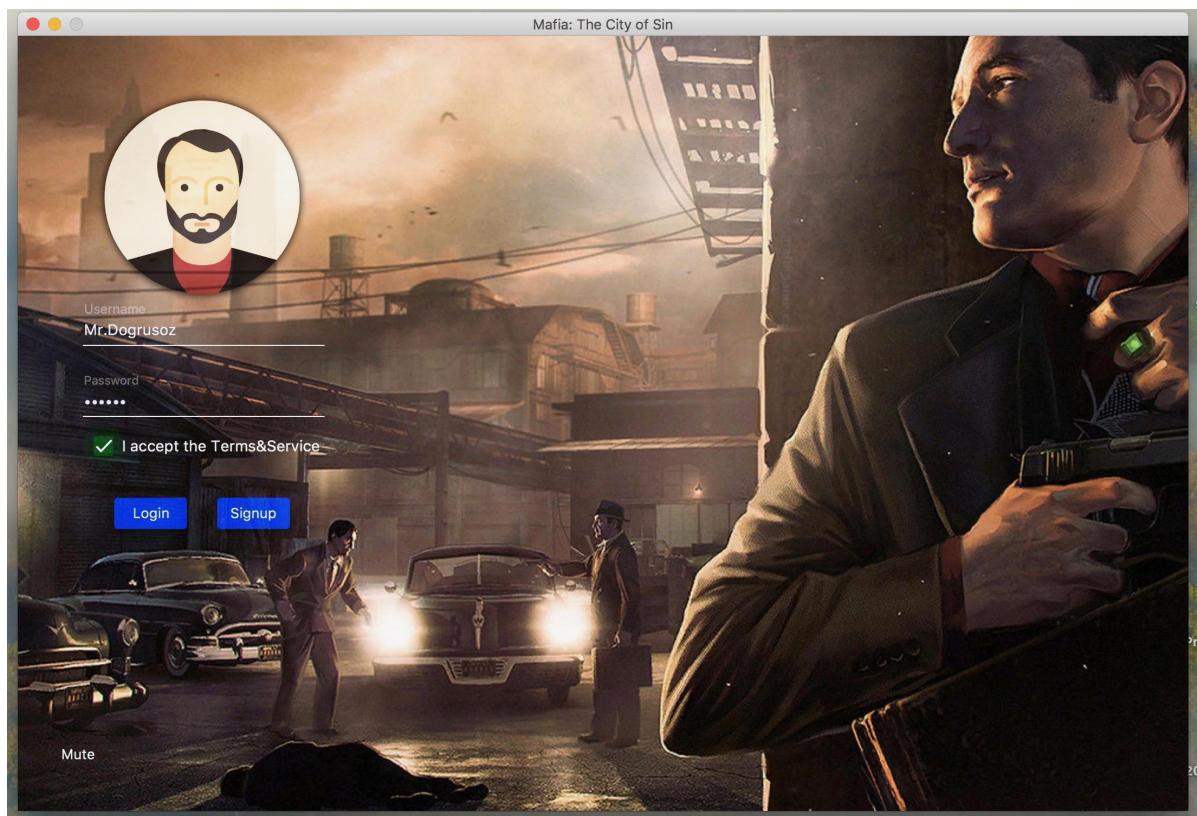
## 2. Changes In The Design

- In the *Pseudo Requirements* section of the analysis report, it was proposed that a popular Java framework, JavaFX be used. However, during the low-level design's class diagram UI classes were lack of JavaFX tools as we were not sure that we would have the time. Since we had time for that, UI implementation was performed using JavaFX.
- In the *Profile* section of the analysis report, we proposed customization

options for the user's profile such as changing profile picture , adding mottos etc. Due to the lack of the time we could not implement customisation options.

- Our low-level design involves *NetworkHelper* as the facade class of the *Network* subsystem. During the implementation process, we decided that *NetworkHelper* basically performs the same way the *AccessManager* does, thus *AccessManager* was implemented as the facade class of the subsystem and *NetworkHelper* was removed.
- Due to the highly variant conditions for achievements, an *AchievementTracker* was implemented to interface with both Player and GameEngine.
- Since we utilized from JavaFX, we did not require classes such as *SubSystemManager*, *ViewManager* and *Panel*. Basically .FXML files were used for the design of the screens and each screen were designed to utilize from UI controllers which have access to GameEngine methods.

### 3. User Guide



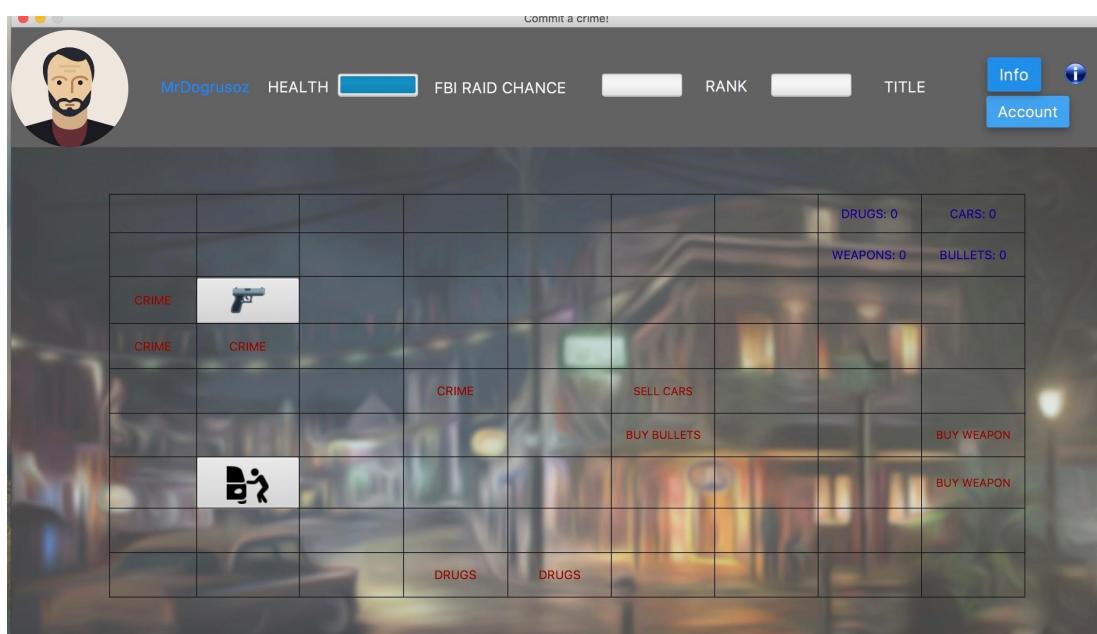
\*Welcome Screen(fully-working final version)

The game welcomes user with a nice landing screen. After that, user needs to create a player account on the Mafia:The City of Sin world. To achieve that, user must type a valid username and password. After communication with the server, user will be logged in matter of milliseconds.

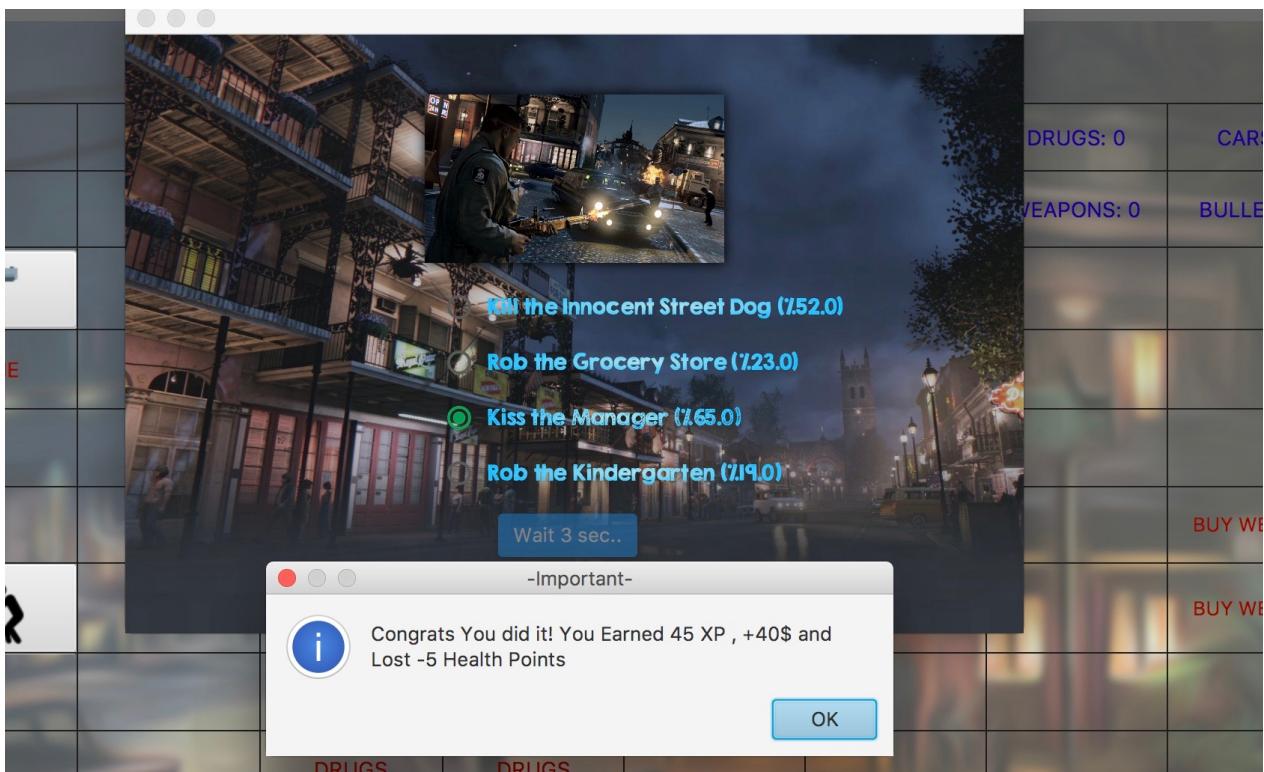


\*Menu Screen(can be accessed from the inside of the game)

After logging in or signing up process, Menu Screen appears which presents a variety of options. By clicking “Continue” user can reach his/her loaded map and continue playing the game. “Profile” option can be clicked for customization or viewing the current stats and user status. “Info” provides general information about the game. By clicking “Settings” button, users will be able to adjust the volume of the game, enable/disable sounds and music. “View Credits” presents the stats based on the rank and money of the player.

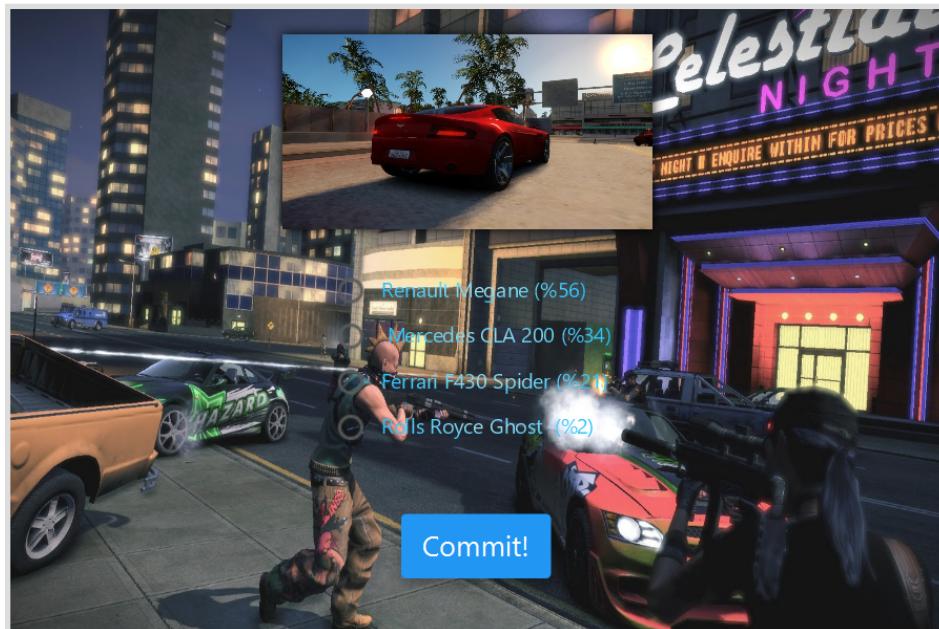


\*Map



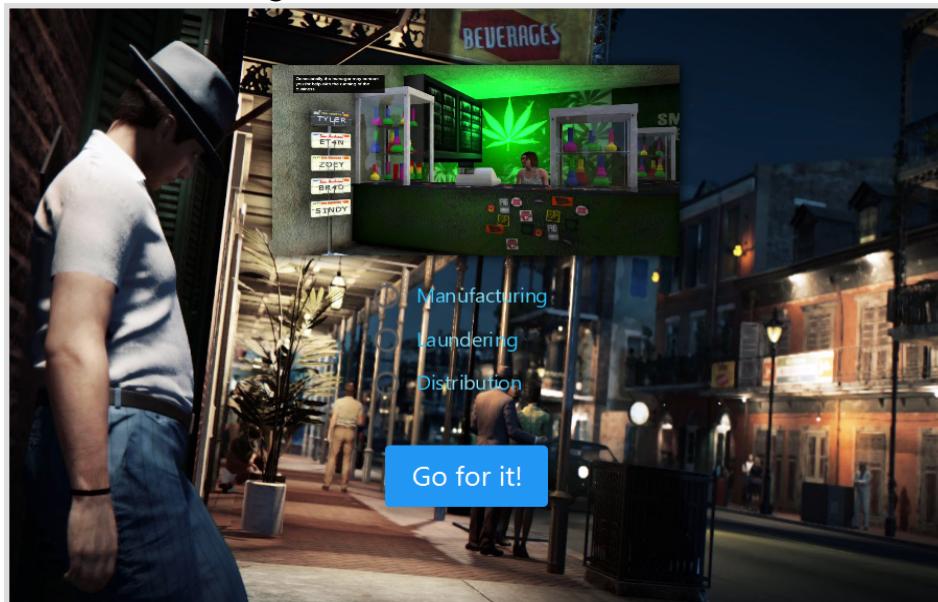
#### \*Commit Street Crime Menu

Selecting a crime to commit and clicking the “Commit Crime” button either successfully yield the reward, or the crime will fail. If the crime fails, the player may escape unscathed or captured in action and sent to prison. In either case, a failed mission will penalize the player by disabling the option to commit crimes.



### \*Property Crime Commit Menu

Users should be careful about the success chance percentages written next to each crime while making their choices.



### \*Drug Business Menu

## 4. Conclusion

Our reason to create this report is to describe the design and our role in the implementation process of “Mafia: City of Sin”. Since an Object Oriented Software Engineering course intends to make students gain soft skills as well as the hard ones, the lessons learned during the whole project development process are introduced below:

### Lessons Learned

- This project helped us to learn working in groups and since the groups were assigned randomly, we developed our skills to work with other people that we did not know before.
- All of our group members agree on that this project helped us to get a glimpse of how our future careers will be like.
- Since all of the members contributed to the implementation, we all have developed our software development skills which will help us be readier to other projects in the future.

- This project also forced us to learn new software criterias such as extendibility and security and response time most due to the Client-Server Architecture implementation.
- We also learned how to use **GitHub** and **Slack** for the project management and communication as a team.
- As the UI was developed by using JavaFX, it's tools, usage of FXML and usage of JavaFX Scene Builder were learnt.
- Even though we couldn't successfully implement some of the features that we proposed, we worked on each and every class and the patterns of the subsystems.
- We are now more powerful and have strengthen our skills!

## 5. References

[\*\*] Some of the in-game images are taken from the beautiful collection of *Mafia 3: Concept Art*; therefore all rights reserved to 2K Games.