Ceng453 - Special Topics in Computer Engineering: Software Construction Term Project

Fall 2018

You will develop an interactive multiplayer video game as a term project. Details of the game and the development process are given in following sections.

1 The Game

The game that you will develop is a simple two-dimensional shooter game. Before you read following details, it would be very helpful if you check "Galaxy Attack: Alien Shooter" on either App Store or Google Play.

Player controls an auto-shooting spaceship by moving it freely (with mouse) in two dimensions to shoot aliens. There should be at least two types of aliens with different attacking capabilities and at least one type of aliens should require to be hit at least two times to be destroyed. These are the only requirements for the gameplay. Other features (e.g. boosts) are up to you.

You should implement authentication functionality. Players should create accounts and sign in with their account information to access the game.

The game will include only four levels. First three levels will be single player levels and the final level will be a multiplayer level. In single player levels, player will destroy all the aliens alone. In the multiplayer level, two players will destroy the same set of aliens and the goal will be to destroy more aliens than other player. Players should do nothing but wait for matching. The player that hits an alien last time before it is destroyed is given the full credit of destroying that alien. The game ends after the fourth level.

The game will include leaderboard(s). You will list the players by their success in the game. There is no strict definition of success. You will design your own rewarding (scoring) mechanism. You should keep track of the leaderboard for the most recent week (last 7 days) and for all times separately.

No graphics design (e.g. fancy spaceships or aliens) is expected. It will not be an evaluation criterion. It is okay to deliver a game client with simple circles and rectangles moving around the screen.

2 Phase 1 - Setup (5%) Deadline: 26/10/2018

In first phase of the project, you will start setting up the development environment and get familiar with it. First, check the database connectivity using your group's credentials and make sure you have access to the database. Then, register to the provided git server, create a repository, and make an initial commit (no need for any code, a README file is enough) to the repository. Note that each group member should register individually and both members should be able to access to the repository. Both members should contribute to the same repository.

3 Phase 2 - Back End Development (15%) Deadline: 16/11/2018

In second phase of the project, you will analyze the requirements of the game and develop a game server. You are expected to implement web services to satisfy those requirements. You will also design a database and create it on provided database server. Your game server will communicate with the database. Concurrency is not a concern for your game server yet.

4 Phase 3 - Front End Development (15%) Deadline: 07/12/2018

You will develop the game client in this phase of the project. You are expected to create a desktop application. You will design and develop the GUIs considering the game definition given in previous sections. Also, you will connect the game client with the back end you have developed.

5 Phase 4 - Concurrency (15%) Deadline: 04/01/2019

In final phase of the project, you will handle the concurrency for your game server which is required for the fourth level, i.e.,the multiplayer level. By the end of this phase, you will finalize all your work and release your final products (client and server).

6 Submission

You will not submit anything on COW or ODTUClass. We will be tracking and evaluating (i.e. grading) your progress on version control system (git). What is expected for each phase of the project and the deadlines are given in corresponding sections.

7 Technologies and Tools

- JavaFX : You will use it for developing front ends (clients) of your games. You are expected to create desktop applications with JavaFX as game clients.
- MariaDB : We have set up a MariaDB server. You will use it for the database requirements of your projects. Each group will have a single database user. The credentials belong to your group will be sent to you by email.
- Spring Boot : You will use it for developing back ends (servers, web services) of your games.
- Apache Tomcat : You will use it for serving back ends of your games. We have set up an Apache Tomcat server. However, you will not be given access to it until the demos. So, you will work with local Tomcat servers for development of your projects.

8 Demos

You will make demos at the end of the semester. An Apache Tomcat server will be provided and you will be asked to deploy your back ends. Demos will be scheduled later. More information about demos will be announced on ODTUClass later.

9 Reminders from Syllabus

- This class does not teach you Java, git, SQL, Spring, JavaFX, etc.
- Late submission : The progress of the term project will be monitored using software versioning tools. For each milestone of the project, the state of your project at the given deadline will be evaluated without exception.