Term Project

CSC 413 SUMMER 2021

SAN FRANCISCO STATE UNIVERSITY

Table of Contents

Introduction

For the final assignment in CSC 413, every student will be completing a term project. This project will consist of a 2D game written in Java, a presentation, and a final documentation for the whole term project. Every student ***MUST*** implement the Tank Wars game. This is **"mostly"** non-negotiable.

The goal of this term project is to practice good OOP. The intended purpose of the term project is for students to implement a tank game that uses good OOP practices. What makes this project challenging is you will be penalized on design choices that go against good use of OOP practices.

A chapter from Game Maker has been provided to get you started on implementing the Tank Wars game. NOTE we are not writing these games in game maker, therefore you must convert the steps into Java code. There will also be resources that you may use for your games.

The following document will outline all the information needed for completing the term project. Please read this document very carefully. Mistakes made while implementing or handling submissions will cause grade penalties.

Requirements

Below is the list of requirements for completing the term project. All steps must be completed.

1. Each student must complete a class diagram for the Tank game
    a. Failure to submit a diagram will cause a 5-point penalty applied to the Tank Game Score.
2. Each student must implement the Tank Game and submit a working jar of the Tank Game for grading.
    a. Failure to submit a working jar will cause a 5-point penalty applied to the Tank Game score.
3. Each student must write and submit documentation for the term project. Submission must be in PDF format.
    a. Failure to submit a document of type PDF causes a 10-point penalty to be applied to the Term Project Documentation score.
4. Each student will make a 2 to 5-minute video demoing their game or games.

GitHub Repository

For the Term Project you will be using a GitHub repository to store your code. To make your repository please click the repo creation link posted on ilearn under the Term Project section. PLEASE NOT CHANGE THE NAME OF YOUR REPO. DOING SO WILL CAUSE A 10 POINT PENALTY TO BE APPLIED TO YOUR SCORE.

Milestones

Milestone One

Milestone one requires no coding. For this milestone, you will create a class diagram for the tank game. Some sample code has been given on ilearn. You can use this code but DO NOT COPY it verbatim. The class diagram does not need to be 100% perfect or complete. It is not expected that you know the full structure of your tank game this early on. The class diagram should be digitally drawn. Hand drawn submissions are OK but not advised. If you spend the time now drawing the diagrams correctly, you save time when you need to fill them in when completing final documentation. You can use sites like https://www.draw.io/ to draw your diagrams.

The class diagram does not need to list any members (variables and methods). Only classes, interfaces and abstract classes need to be drawn. Also, please correctly show relationships if they exist.

Please submit your class diagram to ilearn as an image or as a PDF.

Failure to submit a diagram will cause a 5-point penalty. Submitting a diagram that is lacking (for example, contains one or two classes) will lose points as well. Please do your best to try and really think about your game design.

NO WORD DOC OR ANY OTHER WORD PROCESSOR SUBMISSIONS ARE ALLOWED. FAILURE TO SUBMIT THE CORRECT FILE TYPE FOR THE CLASS DIAGRAM WILL RESULT IN A 5-POINT PENALTY.

Milestone Two

Milestone two will require you to implement the Tank Wars Game in Java. You may use the sample code posted on ilearn to help you get started. There are resources posted on ilearn for the Tank Wars Game. These contain 2D sprites and sounds. You may also use your own resources as well.

The Tank Wars Game has the following requirements:

1. Tank Game must have a start screen requiring a player to hit any button to start the game.
2. Tank Game must have an end screen showing when the game is over.
    a. Allowing the game to restart is optional. It is ok to simply quit on the next key pressed.
3. Tank Game must have 2 Players
4. Tank Game must have tanks that move forwards and backwards
5. Tank Game Must have tanks that rotate so they can move in all directions
    a. Note when only rotating left or right, the tank MUST NOT move forwards or backwards.
6. Tank Game must have a split screen.
7. Tank Game must have a mini map
8. Tank Game must have health bars for each tank
9. Tank Game must have lives count (how many lives left before game over) for each tank
10. Tank Game must have ***3*** power ups (these are items that can be picked up to modify your tank. What these power ups are, is up to you).
11. Tank game must have unbreakable walls
12. Tank game must have breakable walls
13. Tank Game must have tanks that can shoot bullets that collide with walls
14. Tank Game must have tanks that can shoot bullets that collide with other tanks.
15. Tank Game must be built into a JAR and stored into the correct folder in the GitHub repo. This will be the folder named JAR
16. Correctly populate the README.md with the requested information. Please see the README.md in your repository to know what information is required. Each piece of information missing will incur a 2-point penalty. This penalty will be applied to your Tank Game Score.

When submitting the tank game, make sure ALL code is contained in the repository you made. Make sure you have a built JAR for your game and that it is placed in the correct folder in your repository. This folder is named jar. The late deadline for the tank game is determined by the timestamp of the last commit on the ***MAIN*** branch. No other branches will be checked. ***YOU HAVE BEEN WARNED.***

Milestone Three

Milestone three will require you to write documentation for your term project. This document will cover the entire term project from beginning to end.

Your documentation MUST contain the following sections:

1. Title page containing
    a. Student's Name
    b. Class, Semester
    c. A Link to your repository.
2. Introduction
    a. Project Overview
    b. Introduction of the Tank game (general idea)
3. Development environment.
    a. Version of Java Used
    b. IDE Used
    c. Any special libraries used or special resources and where you got them from.
4. How to build or import your game in the IDE you used.
    a. Note saying things like hit the play button and/or click import project is not enough. You need to explain how to import and/or build the game.
    b. List what Commands that were ran when building the JAR. Or Steps taken to build jar.
    c. List commands needed to run the built jar
5. How to run your game. As well as the rules and controls of the game.
6. Assumptions Made when designing and implementing your game.
7. Tank Game Class Diagram
8. Class Descriptions of classes implemented in the Tank Game
9. Self-reflection on Development process during the term project
10. Project Conclusion.

When completing this documentation please make sure you are concise but that each section contains enough information. Point penalties will be added for insufficient information or missing sections.

The final documentation ***MUST*** be submitted in PDF FORM. Please submit your final documentation in PDF form to ilearn by the deadline at the heading of this section (note the repetition, must be important). ***Submitting documentation that is not a PDF will cause a 10-point penalty.***

THERE WILL BE NO LATE SUBMISSIONS.

Milestone Four

Given that we are doing remote instruction we are going to do something a little different for Term Project demos and their presentations. Each student will create a short video of the game they created.

You may use any form of video recording technology that is available to you. Use of smart phones are OK as well. A simple(ish) free opensource video recording software, https://obsproject.com/ , can be used to record videos. It is available on Windows, MacOS and Linux. This is the software used when making the videos for this course.

When making the video, make sure the highlight all the requirements completed in the video. For example, if we were demoing the Tank Game, we can use the following script to demo our games.

- Introduce yourself
- Introduce your game (which game you are demoing)
- Discuss the game and its goal.
- Discuss the controls used to play the game.
- Discuss the powerups in your game.
- Move both tanks around, shoot and break walls.
- Kill the other tank. Then eventually kill the other tank enough to have the game end so you can showcase your end game screen.
- Closing remarks. Anything you would like to say about your game.
- Thank viewers for watching your video.

Please try to keep the demo's runtime between 2 to 5 minutes. Please be careful of your surroundings when recording.

Once the recorded is completed go to ilearn and click the "Term Project Demo" glossary in the Term Project Section of ilearn. Create a new entry with the following name (on ilearn, it is the textbox marked as Concept) First-name Last-named Game-demo-name. For example, if I were demoing my tank game the name would be "Anthony Souza Tank Game Demo". You can upload your video to ilearn using the Ilearn Video button the definition box.

A video will be posted showing how this can be done.

Grading

Grading will happen throughout the term Project. Each item completed for the term project has its own course grade weight. When totally the weights, your term project is worth 49% of your course grade.

Item	Points
Tank Game	150 (25% of course grade)
Documentation	75 (5% of course grade)
Presentation	30 (5% of course grade)

For the **Tank Game** your grade will depend on the number of successfully completed requirements.

If you chose a different choice for the game. A list of requirements needs to be designed by the student and negotiated with the instructor in order make sure there is enough work to be done. Your grade will mostly depend on the completion of the agreed upon requirements.

Both games will also be graded for:

- Smooth Performance (this is more about slow performance because of programming choices rather than hardware).
- pleasant user experience (score, background music, etc)
- Code Cleanliness
- Project Structure

In its simplest terms, I will simply play your games while grading.

Email Request to Change Game

If you would like to do something different than what is presented in the Second Game Options Section. Then you must email a request to the instructor. The request must follow the following email format:

Send email to instructor.

Subject: CSC413.NN Summer 2021 Game Request

Where NN is your section.

Then in the body of the email you will explain the high-level detail of your game.

Then list out a set of requirements like how I did for the tank game. Don't be afraid to list a lot. Let the instructor decide which ones to remove. It is the students and instructor's job to reduce the scope of your game to ensure completion.

Any emails that break format (most importantly the subject line) will be ignored or returned. You are not allowed to work on the project unless it is approved by the instructor.

List of Penalties

Below is a list of penalties that can be incurred during the term project.

1. 5-point penalty for not submitting Tank Game diagram
2. 10-point penalty for changing the name of the Tank Game repo.
3. 5-point penalty for not submitting a working Tank Game jar
4. 10-point penalty for not submitted a PDF for the term project documentation.
5. 2-points penalty for each required entry missing from the README.md in source code repositories.