CS135601 Introduction to Programming (II)

Hackathon

1. GOAL

In this hackathon, you are asked to finish the implementation of the partly Tower Defense game and learn the following skills:

- Understand Allegro5 game development process.
- Get familiar with the OOP concept and the code structure.
- Using Allegro5 and C++ to develop a game.

2. PROBLEM DESCRIPTION

In this game, you need to place the turrets to destroy all the enemies through the enemy wave to win the game.

The game consists of two main components:

1. Enemies: Enemy waves are defined in the enemy*.txt file in the Resource/ folder

   There is currently one enemy: RedNormalEnemy

2. Turret: Placed by the player.

   There is currently one turret: PlugGunTurret

In the playing scene:

- Press key 0-9 to change the speed multiplier.
- Press Q , W to perform a quick select on different armies.
- Press M can mute / unmute the bgm.
- Click on the empty spaces in the map to place the selected turret.

The rule of turrets placement:

- Should not be placed on the path where the enemies pass by.
- Turrets cannot be placed where another turret has already been placed.

However, there are some problems and incomplete parts of the code. You can solve it by following the under requirement.

3. CODE REQUIREMENTS (FINISH THE GAME)

1. Add the Setting scene and finish the StageSelectScene. (0.5%) (Demo video)

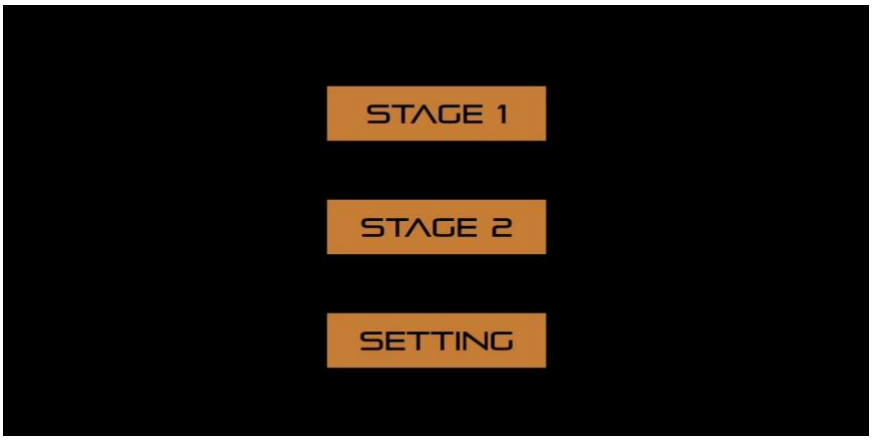
    a. Move the sliders from the stage select scene to the new setting scene. And finish the functionality to support the adjustment of background music volume and sound effects.

    b. Add a new button in the setting scene which can switch back to the stage select scene when it is clicked.

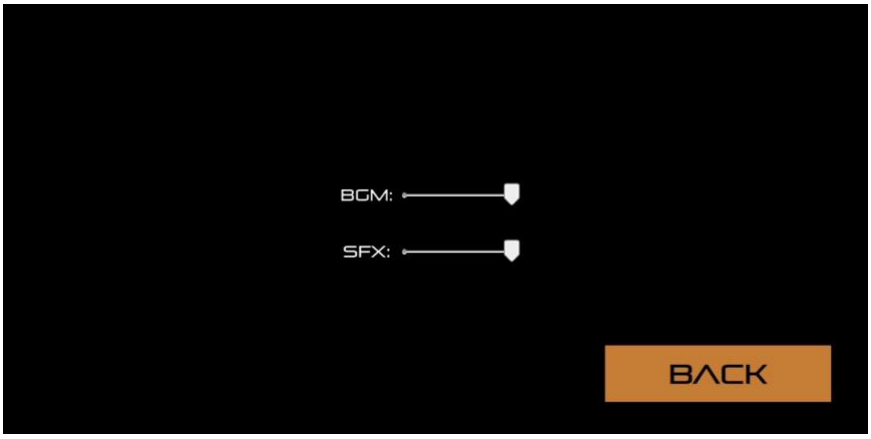
    c. Add a new button in the stage select scene which can switch to the setting scene when it is clicked.

Original StageSelect Scene

Complete StageSelect Scene

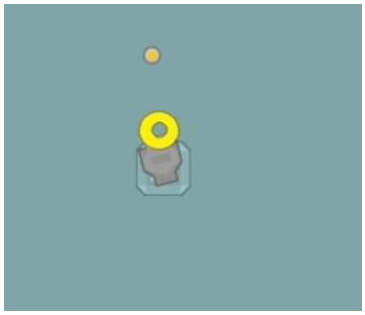


Complete Setting scene



2. Add 1 new enemy - dice enemy. (0.6%)
    a. The enemy can follow the path and reduce the player's life when reaching the base.
    b. Its movement speed is faster than the enemy provided in source code.
3. Add 1 new turret - machine gun turret. (0.6%) (Demo video)
    a. The turret can be placed and automatically attack enemies.
    b. Its shooting range is larger than the turret provided in source code.
    c. Its bullet can slow down the enemies.
4. Add 1 new shooting effect to PlugGunTurret when it shoots the bullet. (0.3%) (Demo video)
    a. The effect should appear every time when PlugGunTurret shoots the bullet.
    b. The effect should appear at the turret's shooting position.
    c. There are 4 images (play/shoot-1.png ~ play/shoot-4.png) that can be used.

Original Effect

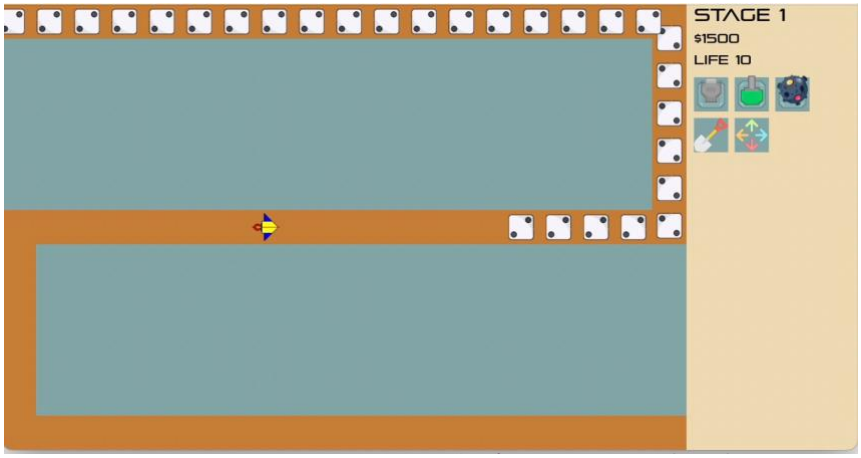
5. Set a cheat sequence and code for debug mode (0.5%)

a. Set Tab as a code to active / de-active debug mode

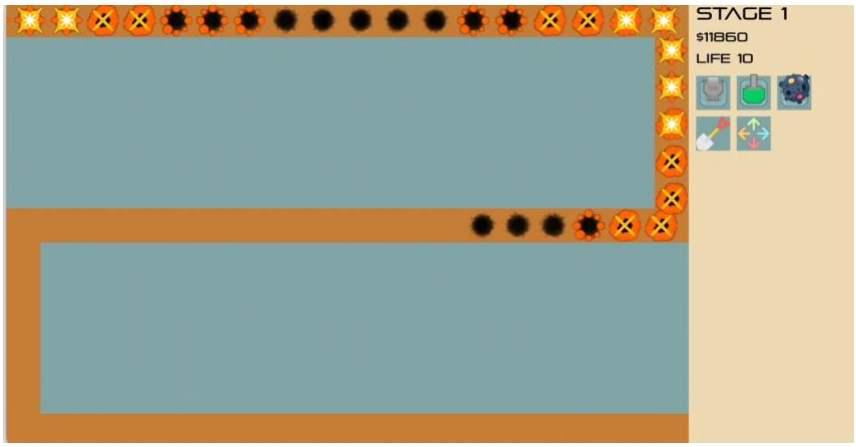
b. Let sequence { arrow_up, arrow_down, arrow_left, arrow_right, arrow_left, arrow_right, enter } as a code to nuke the entire map and gain the money.

   If the setting is correct, you will see a plane flying through the map after the sequence.

Plane



Destroy all the enemies and gain money



6. Fix the bugs in the game (0.5%)

   a. The game will crash when the player wins (i.e. entering the win scene). Try to fix it.

   b. The UI text of “life” doesn’t decrease normally when attacked by the enemies. Try to fix it.

c. Strongly recommend making use of the tools in your IDE such as Stack Trace, Log, Watch variable, Breakpoint (step in / step out) to help you debug.

7. [NOTE] You can follow the TODOs in the source code to finish the above requirements.

8. [NOTE] If you finish the hackathon part on the day of the hackathon. You will get bonus points for your project 2. (1%)

4. DEMO

Make sure you finish all the requirements above and demo the game to TA to get the points of Hackathon. Otherwise, you might receive a points deduction.

Since the hackathon is remote, you need to demo the hackathon by yourself. You have 5 minutes to demo the work, you need to show all the requirements above to get points of the hackathon. Notice that TAs will score only by your demonstration, so make sure you prepare before the demo. Otherwise, you might get points deduction for missing showing some of the requirements.

Demo link: hackathon demo

[NOTE] It's ok not to complete this spec on the day of the hackathon. But make sure you demo this part in the demo time of project2 to get the points of the hackathon.

5. ASK QUESTIONS

In the period of QA time (i.e. 10:00-11:00, 14:30-16:00), if you have any questions, you can directly join Microsoft Teams to ask TAs. Otherwise, please type in the chat to check TA is online first, and then join the Teams.

[NOTE] After the end of the hackathon, TAs will not answer any questions about the hackathon spec and todos. Hence, please make sure you understand everything you need to do in the hackathon, even if you aren't able to finish it.