

CIS 120 Homework 9 Proposal

Please do not write more than the space provided and do not change the size of any table.

Please indicate your name, the name of the game you plan to implement, and the core concepts you plan to use. Remember, you need to choose 4 core concepts. If you are using a concept, indicate **yes** and provide a description. If you are not using a concept, indicate **no** and leave the description blank.

Name: Bethany Hsiao

Game: Galaga Space Invaders

Please **describe your game** if (1) the game is not well known (2) you have made any changes to a well known game or (3) you have created a new game.

I will implement a combination of Galaga and Space Invaders. The game will mostly resemble Space Invaders, except that some invaders will behave like the Galaga villains and drop down to directly attack the player.

1. Will you use **2-D arrays** in your game?

× Yes No

Describe how:

I will use a 2-D array of integers to represent the grid in the game. 0 represents a blank position; 1, the player; 2, an invader; and 3, a bullet.

I will also use a 2-D array to store the invaders. Since they need to be arranged in rows and columns, a 2-D array makes the most sense to store them.

2. Will you use **Collections** in your game?

× Yes No

Describe how:

I will use a LinkedList to store the invaders. Since I will position invaders based on their indices, using a LinkedList makes the most sense. Since a set is unordered, ordering them would be more difficult. I also don't want to pair any of the invaders with another value, so using a map does not make sense. In addition, I want to remove invaders if they are shot down, and a normal array does not allow one to change the size of the array, so again, a LinkedList makes the most sense.

3. Will you use **File I/O** in your game?

Yes ☒ No

Describe how:

4. Will you use **Inheritance/Subtyping for Dynamic Dispatch** in your game?

☒ Yes No

Describe how:

I will have two types of invaders. All of them will employ the same move() method but will attack differently. One type will be the traditional kind from Space Invaders and just drop bombs. The other type will be similar to the Galaga kind and swoop down to attack the player. Since the invaders will share draw() and move() methods and have unique attack() methods, it makes sense to make an Invader interface so that I only have to implement the draw() and move() once and can just implement different attack() methods.

5. Will you have a **Testable component** in your game?

☒ Yes No

Describe how:

The states of the Invader, Bomb, Bullet, and Player objects should change based on their interactions. For example, if an Invader touches a Player, then the Player should lose a life and the game should pause. Also, if a Bullet hits an Invader, then the Invader should die and the size of the LinkedList of Invaders should decrease by 1. I will design this functionality such that I can test it with JUnit.

6. Will you use **Recursion** in your game?

☒ Yes ☒ No

Describe how:

7. Will you use a **Novel linked/recursive data structure** in your game?

× Yes × No

Describe how:

8. Will you use **Complex game logic** in your game?

× Yes × No

Describe how:

9. Will you use an **Advanced topic** in your game?

× Yes × No

Describe how: