

## Assignment 3

### Code smells identified:

1. We discovered a **poorly structured code** for spawning diamonds, spaceship parts, black holes and doors. Since all of the assets of our game are reset to new locations each time it's played, our algorithm would first randomly choose coordinates that were within the bounds of the map, check to see if the chosen coordinates are pre-populated by a solid object, and if they are, keep choosing new coordinates until you find a free spot. This made our system work much harder as most times it would choose coordinates of an already populated tile in which case it would loop for an indefinite amount of iterations until it didn't. The refactoring we performed lets our "random" coordinate-choosing logic only choose from coordinates we already know are empty. This refactoring makes our spawning and despawning more precise in terms of timing and also makes for cleaner code.

Link to refactoring commit:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/35a2395cb358848cc2f8037b72400c8e6dcff988](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/35a2395cb358848cc2f8037b72400c8e6dcff988)

2. We discovered **duplicate code** within our assetSetter class. The assetSetter class is responsible for placing objects on the map, often with random coordinates. Since many of the methods within our assetSetter class repeated the same logic to find an empty place for the object they're responsible for, we packaged up that logic into its own method called getRandomCoords(). This way we have less duplicated code and also have a helpful function we can make use of in the future for that class.

Link to refactoring commit:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/7fca57f93cc7d67fae658dee135bfcd926e75452](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/7fca57f93cc7d67fae658dee135bfcd926e75452)

3. We discovered that there was a **lack of documentation** for the player class. Since the player class is one of the most critical parts of our game, we added descriptive comments about some of the confusing logic within it. This included things like describing the logic regarding top score, invincibility and resets. Larger interactions that the player is involved in, such as collision checking with various objects, have also been documented.

Links to refactoring commits:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/a44394f9625b3e00f51c8aea28db56879c38a003](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/a44394f9625b3e00f51c8aea28db56879c38a003)

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/a8ea3ae94005e5399ab3be49a3f012acaf462799](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/a8ea3ae94005e5399ab3be49a3f012acaf462799)

4. We discovered that there was a **lack of documentation** for the keyHandler class. The keyHandler class is at the core of our game's behaviour. Without it, there would be no way to control the player and his interactions. There was almost no documentation for

our keyHandler class (not including java docs) so we put some time into making the source code more descriptive and easier to understand.

Link to refactoring commit:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/7c6ca6f4d0a7242a8bfc9b546c30182acb654d6e](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/7c6ca6f4d0a7242a8bfc9b546c30182acb654d6e)

5. We discovered **duplicate code** in the Alien and Player classes. Both of them are entities that become invincible after taking damage. After becoming invincible, a counter is incremented until a certain number, where the invincibility will then be turned off. Thus, rather than having an invincibility check in both their update methods, the code has been removed and moved up into the Entity class as its own method.

Link to refactoring commit:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/9ef42ace226f085972be307496160f3972639e27](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/9ef42ace226f085972be307496160f3972639e27)

6. We discovered **poorly structured code** in the GamePanel class. Alien spawning is a crucial part of the game, as it allows for an increase in difficulty the longer the game plays out. The way the old code was structured relied on too many conditions and was difficult to understand. It was also sensitive to changes made outside the GamePanel class. Thus, the code has been rewritten to retain the same functionality, while also being more readable, with the only change in behaviour relying on the size of the Alien array, which is defined within the GamePanel class itself.

Link to refactoring commit:

[https://csil-git1.cs.surrey.sfu.ca/CMPT276F22\\_Group1/project/-/commit/a3fcd496ab252d2366912596f1db59044768e937](https://csil-git1.cs.surrey.sfu.ca/CMPT276F22_Group1/project/-/commit/a3fcd496ab252d2366912596f1db59044768e937)

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