



*In this document, change references (e.g 'Change CA1' refer to changes in detailed in the change report, Change4.pdf.*

After taking on team *Team Gressingham's* project and discussing and analysing the new requirements, we had a list of features that we had to implement in addition to code that we wanted to refactor and change from how our game worked previously, as *Team Gressingham's* game was itself inspired by another team. There were different changes that we made: smaller changes to gameplay and graphics and larger changes such as adding the required cheats or features that required more work. In doing this we also met all the requirements discussed in the requirements document.

The changes that we made to gameplay were to improve the player experience. First we realised that once the player was damaged they could be repeatedly damaged without any cooldown, and that if this mounted up it could be unfeasibly disadvantageous to the user. To rectify this we implemented damage frames (change CA2) where once the player was damaged there would be a brief period of invulnerability. To further improve player experience we updated both the movement speed of the player and enemies so that the player could escape enemies but the enemies felt like a threat. To continue we also changed the nature of power ups so that they lasted longer and felt like more of a bonus (change CP2), and finally, the most important small gameplay feature was implementing the player facing the direction they are shooting - not only does this look much better on screen but it also feels like the player has additional control over the character (change CP3).

Another area that we altered was the graphics and UI. We rearranged all of the UI so that it was more consistently grouped together and easier to read. To continue this theme we made the mini map more transparent (change CA1). In addition, to increase the eye catching nature of the power ups they bounce according to a sine wave with an added shadow effect (change CP2). Finally we updated the projectiles appearance so that it fit with the appearance of the added explosions (change CA6, discussed later), the new maps and the new art style. A change that combines gameplay and UI was the addition of health bars to the enemy (change CA5), this provided feedback to the player and gave the player some indication of how they were performing. Additionally to increase the polish of the game we implemented music and sound effects. This includes menu music, in game music and sound effects for the players and enemies attacks.

As the updated requirements stated that we had to implement two (fair) cheats, and deranged behaviour for both the player and enemy ducks. To implement the cheats there is first a pause menu that is opened once the escape key is hit (change CC5). From there the player has to enter a series of buttons in the correct order to gain access to the cheats. In the manner of old school console games. The two cheats that we implemented are explosive projectiles and a screen overlay (change CA7). The overlay is based off a short game we made when testing libGDX. A sprite off a duck bounces round the screen obscuring portions of it. While this is active the player receives a score bonus. The other cheat that we implemented was explosive ammo. This added a particle effect to bullet impacts and added relevant explosion sounds. To stop this from becoming too overpowered we had the bullets not cause any additional "splash" damage, so that they served as only an interesting visual effect.

To implement the deranged nature of the player, after a random amount of time a button prompt appears above the player's head. The player will have to press the button before time runs out. If they fail they become demented and their control scheme will become messed up disarranged, for example for a short time up may become down and left may become right (change CA8). If the player succeeds they receive random power ups. We feel this works well as it adds an element of danger but also gives a fair reward to the player if they succeed. To meet the requirement of having deranged enemies we implemented an enemy suicide mechanic. Deranged enemies will charge at the player and then will explode into feathers. Each of these feathers acts as a projectile and can then damage the player (change CA3).