**Games Engineering Report**

Daniel Seavers, Jack Millar and Maja Heltowska

1. The assignment we were given was to create a game, this game needing to be of a playable state by a stranger coming into it with no experience of how it worked or what it entailed, from this we decided to create a game where the user would control a physics based ball that would move around the stage through controlled bounces, and combat enemies generated in the stage. The inspirations for this came from horde based games like vampire survivors and blockhead and the idea of using simplistic graphics came from games such as diep.io and agar.io.
2. In our GDD we had planned to have more levels available to the player than we did in the end, however due to the complexity of creating the level code repeatedly for new levels this did not end up feeling worth the time and thus was left out. The task of implementing a boss did not feel worth the required effort after making the rest of the game as we felt it would not add much and would cause far more complications. While the current implementation of the game is endless, the player cycles through a repeating set of three rooms. We were not able to add co-operative play to the game and felt that it would take away from the enjoyment the main player would have while playing. In the end we decided to not have the player able to shoot the enemies as between time constraints and difficulty implementing such systems, we in the end opted for bounces to be the sole source of damage. Reducing the number of edges the circle had and eventually turning it into a square, while a cool idea was impractical for the project scope. The speed of the player is inconsistent as is to be expected with a physics object thus at times it moves far slower than a triangle and at times it moves far faster. Squares were not implemented as the enemies ended up taking far too long to implement for it to be worth adding variety. The wave effect is invisible but triggers every time the player lands in the current implementation. Pentagons have also not been implemented at this time. Health and damage values have been changed since the original plan and are still being tuned as I write this report. There is no squangle or other shooting enemy currently. Due to a bug causing enemies to spawn in walls we currently open the exit on its own after 2 seconds, but if this bug is fixed it will be changed to when all enemies die. The player uses arrow keys and the space bar for ball control. Currently enemies do not pass through walls. There is no in game story currently. Currently there are no ui buttons implemented in the game and the title is displayed in a standard font. There is currently only a plain black background, and the platforms are plain white rectangles, the doors are green squares. None of the planned animations have been implemented. The game does not currently use any sound effects. The game runs at over 2000 fps when uncapped so should run on most devices. The game may not be complete to a state where it can be uploaded to itch.
3. The Enemy State Diagram at Appendix 1 shows how the enemy AI works and the states it uses. The enemy starts in its stationary state, then if the player is in range of the enemy, the enemy will enter the seek state and move towards the player and when it gets to closer distance it will enter the flee state which makes the enemy stop at a close distance to the player, it was planned to stop at a close distance and shoot at the player, with more time that would have been implemented.
4. The game is on the right track to match the original plan. The player bounces around the room as was described in the plan and the enemies follow the player to attack. We did not have time to include the sound effects or animations in the original plan. The player gained a double jump ability through the process which makes moving around the level more interesting. The aim of the game is still the same, to survive and escape. We also changed the player controls to arrow keys instead of WASD but kept the spacebar for jump movement.

It is not finished so it would be unfair to truly compare it to fully finished games however we were inspired by games such as diep.io for its minimalistic design and our game does resemble that style with simple colourful shapes for the player character and the enemies. It doesn’t quite have the attack and shooting like diep.io but with more time it could have the potential to be more similar. Our game does have some resemblance to the horde like fighting and survival we were inspired by from games such as Vampire Survivors, since there are many triangles attacking the player who needs to survive the level.

c)quality of game

-unfinished but good start for more serious development

There are many improvements that could be done with more time which would lead to more characters being added such as square enemies, squangles and pentagons. More defined attacks for both the player and enemies as well as levels and some of the sound effects and possibly animations that were planned.

1. We used the SFML library for the graphics of the game, and it would also be used for implementing the sound effects into the game. We also used the Box2D library for the physics in the game.

Appendix

Appendix1:

A screenshot of a cell phone

Description automatically generated