

The first day of the project began with getting the basics of the PixiJS application set up in a default webpage. The focus at that point was getting very basic functionality for a starting screen, a game screen, and a game over screen. The text and buttons at this point were incredibly basic and are placeholders that borrow heavily from the Circle Blast Homework. The next order of business was being able to dynamically draw and represent the track the player's troops would move along. I went about this by first making a 2D vector library that would give my vectors a bit more functionality than the PixiJS defaults. I then used this vector library to create nodes that would represent a corner of the track and point in the direction of the next node. I connected all of these nodes in a Track class and finally I had a track on the screen. For the rest of the second day, I made a basic troop that would walk along the path on the screen. I faced a lot of difficulty when trying to get the troops to round the corner smoothly, since the change in direction is based on a collision with the invisible node, the troop ends up turning too early and is not centered in the track.

Immediately after getting over the hurdle of track movement, I ran into another hurdle: making enemies that fire at the player. Creating bullets to fire and even getting enemies to target the player's troops wasn't particularly difficult, but no matter what I did, I couldn't seem to get the enemies to anticipate its target's movement, leading to frequent misses. While this wouldn't be horrible in most genres, tower defense games generally require that the towers are accurate enough to reliably hit their targets 99.9% of the time. Unfortunately, due to the fast-approaching deadline, I had to take a somewhat hacky approach: a troop being targeted takes damage whenever the enemy tower shoots, resulting in occasional instances of the player taking damage from a bullet that clearly missed them. If I had more time, I would love to fix this issue but as it stands, it will be a project for post-deadline. Now that I had towers shooting at player troops, I added health bars so the player could see approximately how much health their troops (and the barricade which would be implemented shortly after this) had remaining. With the barricade made, I had finished the base mechanics of the game and could start adding polish.

For polishing, I added audio clips for enemy towers shooting, spending/earning money, attacking the barricade, and destroying the barricade. I then got to work adding basic styling to the game page and adding more levels. For a final touch, I got some sprites from OpenGameArt and finally got a much-needed replacement for the box graphics I had been using up to that point. I would have liked to improve the background, fonts, and track, but once again, time is not on my side for this project. Lacking time seems to be a running theme with this project, so I'm thinking I will have to get started earlier on future projects and use my time more effectively. In fairness, I was told that making a tower defense game would be tricky with the amount of time allotted, so all things considered, I'm content with how far I got, just slightly dissatisfied with the final product. I look forward to maybe revisiting this project sometime in the future as a personal project or other follow-up.

The in-game sprites are from "A Blocky Dungeon" by the user Buch on OpenGameArt:  
<https://opengameart.org/users/buch>

All credit for audio is given to their respective creators on Freesound: <https://freesound.org>