**Programming**

**Game Project**

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My game project takes the form of a simple game in the bullet hell genre.

As such my game makes use of many mechanics commonly used in this style of game, and with so many interlocking systems it was vitally important to do proper testing to ensure the game was working as intended.

Game testing was performed using both system and unit testing, primarily system testing constantly throughout development.

**Unit Testing**

Unit testing was primarily used during development before the game was made playable. Before the game was rendered playable systems had to be tested standalone with test inputs, however once the game was working unit testing was primarily used to solve many issues that hid within the code that were hard to locate.

For a simple example, the code used in the enemy firing task was inaccurate, leading to poor aim. This was later discovered to be due to some misnamed variables. This was found by splitting the aim functionality out on its own and logging the values of the inputs fed in and taken out, allowing location of the parts of code reading the wrong inputs.

However outside of some specific issues unit testing was less used overall, due to the live action nature of the game making it hard to test most code on its own without the other systems running to act around it.

**System Testing**

System testing was the bulk of testing done for the game. From start to end the game was run many times over to make slight tweaks and changes, many bugs sneaking their way in between code changes and only being discovered after another complete playthrough of the game.

The game was built to include logging functionality in many places, most notably with errors to do with reading and writing to files and loading textures. These logs aided in locating the source of issues.

Some tests performed as part of system testing:

* Key rebinding of all available inputs.
* Multiple complete playthroughs to test enemy placement, bullet patterns and overall game feel.
* Numerous tests of enemy accuracy.
* Tests of enemy and player heath, as well as blank usage, to test for any issues or missing checks.

**User Feedback**

I was unable to have other people test the game themselves however I have shown the game to a handful of my own friends over video calls. Overall, there was not much feedback to be had however and no major changes were made.

**Game Assets**

The game was largely developed using placeholder textures taken from the game Minecraft, however late in development I had gotten some custom assets made for the game by a friend of mine. In the end no sound was used due to time constraints.

**End Result**

In the end, after the numerous tests run and nearly 100 hours of development, the game was left rather bug free and without any major design flaws.

The main thing the game is lacking in is sound effects and background music, largely due to time constraints. One thing the game could do with more of overall is more content, as currently the game consists only of one gameplay stage.

Past this however I would mark the game as a success overall.

**References**

Custom game assets made by [@voxel\_dani](https://twitter.com/voxel_dani).

Placeholder textures taken from [Minecraft](https://www.minecraft.net/en-us).