

Programming (2IP90) CBL Assignment -
Topics of Choice: *Game Design and Version Control*

2D Shooting Game: Alien vs Earthling
Author: Aldair Pedro (1589296), Gihak Kim (2083132)

First Topic of Choice: Game Design

The game that we created for this CBL assignment is called 2D Shooting Game: Aliens vs Earthling. We have been inspired by an iOS game that we used to play called “Dan the Man Platformer”. This game is highly popular on AppStore; with over 10 million downloads 25K ratings, 4.7/5.0. So what makes this game so appealing to users? Well, as we have played this game before, we knew about what the developers implement to do so; there are several levels to complete which makes users keep playing. The difficulty varies at each stage. With this logic in mind, initially, we planned to make at least two rounds so that the game is not tedious and attracts users' attention. However, as we will explain later, this could not be achieved due to our lack of coding skills. Furthermore, “Dan the Man Platformer” has different skins for the characters and this stimulates users to use another skin/character. It also interests them to try out new things. This is their marketing strategy as well as knowing users' psychological behavior.

So, we also decided to color the white astronaut a red and green color to let the user select their preference.

The rules of our game are simple yet difficult. The user must kill the aliens that are 1000 points each and reach 10000 points to successfully finish the game. The aliens also attack the user by randomly generating from the right side of the screen moving to the left side of the screen. If we had better coding skills, we wanted to extend the game by going to the next round of killing the boss alien that is more powerful in terms of attack damage and HP. However, as mentioned before, it was not achievable in the end. Nevertheless, we still wanted

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to make the game more challenging to make the game more engaging. So how did we do this? We simply made the earthling (user) moving speed slower, spawned both aliens more frequently, increased the aliens' moving speed, and reduced the earthling's attack damage to the aliens. The user must also hit precisely the middle part of the aliens to reduce their HPs and destroy them. We have played this way by ourselves, and it was difficult yet appealing enough to keep trying until the user succeeded. If the user fails to reach 10000 points, they can press the R key to restart the game and re-attempt. This function makes the user not to give up and keep playing the game.

How to play this game is fairly simple if the user has played computer games before. All it uses is the W, A, S, D keys to move around and hold down the space bar to shoot aliens. To clarify to the users how they can play this game, we have included a "How To Play" screen in the game.

We thought every element of this game - graphics (background), background music, and texts - mattered for game design. It is a 2D game, so compared to a 3D game, it is inevitable that there are fewer motions. To complement this, that is why graphics, BGM, and texts matter. We intentionally chose graphics and fonts that are vivid and magnificent. For BGM, we chose BGMs that give tense feelings when playing the game. For texts, we tried to use 'violent' words like destroy, save, etc to stimulate the users.

Of course, we faced challenges when we were designing the game. As mentioned before one major challenge was that we couldn't progress to code the final round. We really tried our best but as the screen transitioned to the final round, it was glitchy. So that is why we decided

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to make the first round challenging. Another challenge was that the green alien was supposed to shoot green ammo, and the blue alien shoots blue ammo. But in the end, they both shoot the same color of ammo. Another challenge we faced was a bug/glitch while playing the first round. We did a lot of tests by playing the game ourselves but sometimes the aliens suddenly disappeared from the screen even though the user did not destroy them. Also, when the user destroys the aliens, the user gains 1000 points. However, sometimes, the alien worthed 2000 points which we think is a glitch. To fix these errors, we used online sources (for example, Stackoverflow) but none of them helped with our problem.

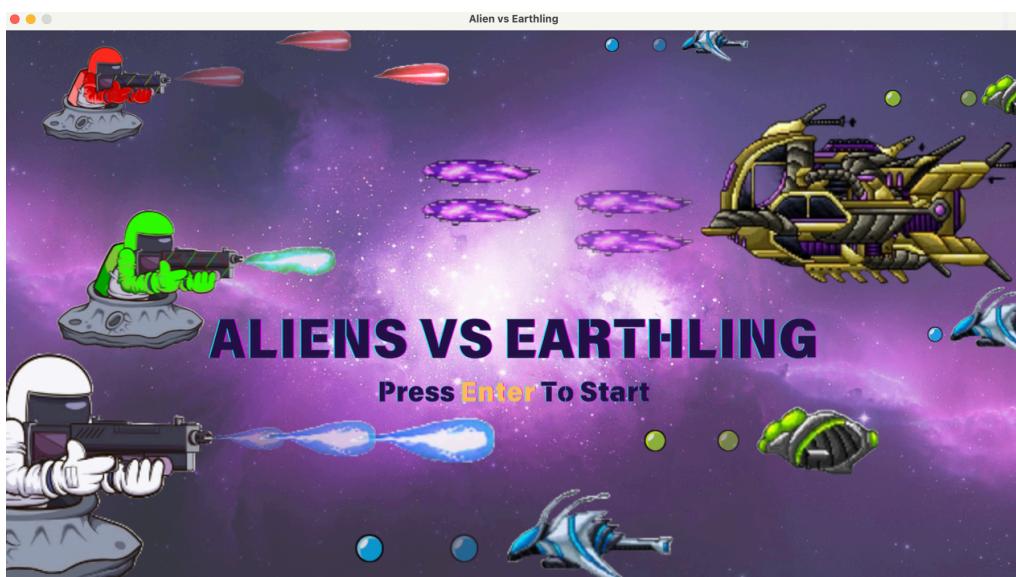


Figure 1. Main screen. (Made by ourselves using Canva.com)

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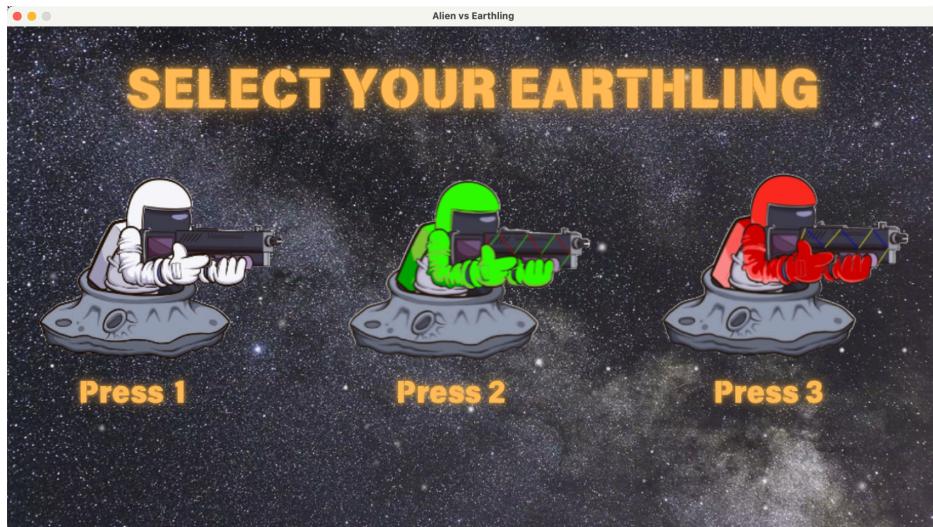


Figure 2. Earthling Selection Screen (Made by ourselves using Canva.com)
The user chooses (using the number key; 1 or 2 or 3) an earthling based on their color preference. (The white astronaut is the original, and we have colored green and red by ourselves)



Figure 3. How to play screen to clarify to the users. (Made by ourselves using Canva.com)
Fonts have effects to not make the game look bland.

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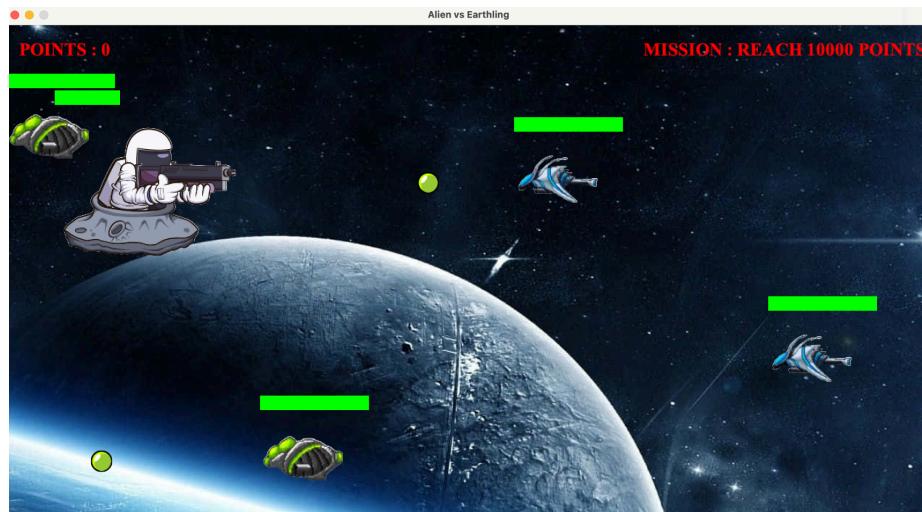


Figure 4. The user loses its HP and the aliens attack.



Figure 5. The user presses the R key to re-attempt the game.

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Second Topic of Choice: Version Control

Through this CBL assignment, we learned how to use [GitHub](#) correctly and collaboratively. By learning Git commands, we were able to manage our game code efficiently. Git and GitHub became essential tools that allowed us to record code changes, collaborate effectively, and revert to previous versions whenever necessary.

For the first time, we used the '**git init**' command to initialize a local repository, which turned our game project folder into a trackable Git repository. After that, we added all changes to the files to the staging area using '**git add .**', ready to save them as Git records. Whenever we completed important tasks, such as finishing alien characters or fixing bugs, we used the '**git commit -m "message"**' command. Each commit served as a snapshot that captured the game's progress, allowing us to record what features were added or modified.

To back up our game code and share it with others, we used the '**git push**' command to send the committed changes to GitHub. When we first connected the project to GitHub, we used the '**git remote add origin URL**' command to establish a link between our local code and the online repository. When working on other computers, we used '**git pull**' to update our local files with the latest changes from GitHub, ensuring that everyone on the team had the most up-to-date version. When we needed to check out someone else's work or start a new project, we used '**git clone URL**' to download the entire repository again.

Learning terminal commands on both MacBook and Windows was essential throughout the project. Typing '**git status**' into the terminal allowed us to see which files had been modified,

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which files were ready to commit, and whether they were up to date with the GitHub repository. We also learned shortcuts for managing project files efficiently through the terminal, navigating directories, editing files, and performing Git operations on various operating systems. This command-line knowledge was as important as the game code itself, making our workflow much smoother, especially as the game files grew larger.

Another important lesson was how to deal with mistakes. We learned that we could check our commit history with the `git log` command, and revert to a previous version with the `git checkout commit-hash` command if necessary. This allowed us to recover from unexpected bugs or design decisions that didn't work out.

The screenshot shows a GitHub repository named "Alien_vs_Earthling". The commit history is displayed, showing numerous commits from two authors: Aldair Pedro and Gihak Kim. The commits are organized into several logical groups:

- Initial Setup and Basic Functionality:** Includes commits for setting up the game structure, adding basic classes like Alien, Earthling, and AlienAttack, and implementing basic movement and shooting logic.
- Character Selection and User Interface:** Commits related to adding a character selection screen, handling user input for movement and shooting, and creating a main menu screen.
- Game Logic and Collision Detection:** Commits for implementing collision detection between characters and alien attack objects, and for adding health bars and score tracking.
- Visual Enhancements:** Commits for adding backgrounds, changing screen resolutions, and improving image loading and rendering.
- Final Tweaks and Deployment:** Commits for finalizing the game's appearance, fixing bugs, and preparing it for deployment.

The commits are timestamped, showing a continuous development process from October 2024 to November 2024. The commit history is a visual representation of the team's collaborative effort and iterative development cycle.