Final Report

**Team:** Hackstreet Boys (Team B2)

**Authors:** Humna Hanif, Andrew Matos, Jordan Mayo, Julia Woeste

**Date:** 14December 2021

1. Overview

*Meet the Team*

|  |  |  |
| --- | --- | --- |
| Members | Role | Major Strengths |
| Humna Hanif | Team Member | * GitHub Experience * Good Communication * Meeting Deadlines * Time Management Skills |
| Andrew Matos | Scrum Master/ Team Member | * GitHub Experience * Leadership Experience * Programming Experience |
| Jordan Mayo | Team Member | * Graphics * Creativity |
| Julia Woeste | Team Member | * Creativity (i.e. game design) * Communication Skills * Determined |

*Purpose*

The overall purpose of this course project was to expand upon a 2D Platformer Game created by the previous course where customer satisfaction is taken into consideration alongside developing teamwork skills. The types of bugs and enhancements prioritized were acquired from the feedback and observations noted from the customer requirement report. It was critical to go through the documentation provided by the previous team in addition to looking over code for comprehension.

*Organization & Prioritization*

The constant practice of organization is necessary in order to ensure our team’s success in this project. We made sure to organize the code, the workplan, and our backlog, as much as possible. This is significant when working in a team, and this will be helpful to the next team picking up where we left off. Our backlog was organized starting with the enhancements with the highest priority, then the medium priority ones, going down to the enhancements with the lowest priority. We determined the priority level of the enhancements by its importance pertaining to making gameplay easier and our initial estimate of its difficulty to complete. All the bugs were listed as high priority since it was necessary to complete those for the game to work properly.

*Project Management Tools*

Our team constructed a schedule based on the time limit we had for each scrum sprint which averaged around 2 weeks per scrum sprint. Within each two weeks, the team met on Tuesdays and Thursdays within class to discuss progress on each task given throughout the scrum cycle. Due to us working asynchronously sometimes on our given tasks, the team decided to meet up on extra days such as Monday and Wednesday to express any concerns or provide any ideas in making the project workflow better and the project build flawless. The team had enough time to do practice runs on the presentation for the instructor to ensure that it was well - prepared and all necessary information was added. At the end of the scrum sprint, we would fill out documentations on what occurred during the scrum sprint, completing the individual and team postmortems, a notable system improvement, and our backlog.

*Project Configuration Tools*

When it came to development on the project such as coding, we used tools such as Eclipse IDE, Git, Cmder, and Github Desktop. The main tool, Eclipse IDE, was primarily used when coding any enhancements or bug fixes within the project while the other tools were used to provide a way to collaborate with each other and upload our improvements to the project. Tools such as Cmder and Git were used to push and pull requests within the project code.

*Development Progress*

The progress made on developing the software was excellent as most of the tasks we set in each scrum cycle were completed with no flaws. All the necessary documentation is recorded, each including all the required information.

*Testing*

Evaluating the quality of a product is done by testing the software. This helps measure the quality by understanding any flaws, which may include bugs, that can have a negative impact during the development process.

The product of the software system was tested through a test plan which was developed for each work unit prior the starting the scrum cycles. These test plans included steps and their expected outputs. It was crucial for each step to pass in order to move on. After an enhancement or bug was programmed by the members tasked to complete the work unit each team member would test the code to ensure it followed the test plan. If the test cases passed then the work unit was deemed completed, however if it did not pass it would be marked as failed and the members assigned to the task unit would have to take another look at the code if time permitted.

1. Process

*Project Management*

When it came to project management and documentation on the project, we used tools such as One Drive, Microsoft Word, PowerPoint, and Excel. Each tool was used for a specific need within writing documents. Excel kept our workplan and allowed us to form a backlog with Microsoft Word. By updating the backlog and workplan, we were able to form various documents such as postmortems, notable system improvements, and code documentations which were on OneDrive. Once documentation was complete, the team uses Microsoft PowerPoint to create presentations providing all work done during each scrum sprint.

*Key Features of Work Plan*

The work plan’s key features include:

* + Backlog item, to note what work unit belongs to each requirement in the backlog
  + Work units, which were the different tasks we planned to complete, this being enhancements broken up into smaller units, testing units for each enhancement/bug, and any reports we had to complete.
  + Description of each work unit, to get a better insight into what exactly we were planning to do with that unit.
  + Start date, which is when we wanted to start the work unit, and end date, which we recorded the date of when we completed the work unit.
  + Due date, which is when the specific task was due, or when we wanted to complete it by.
  + Estimated time to complete, which we estimated and recorded before starting the unit, and the time it actually took to complete, which we recorded once we completed the unit.
  + Person(s) responsible, which just listed the members who worked on the unit.
  + Comments, which were left for any additional information we wanted to record, if needed.
  + Status, either not started, completed, or not completed.
  + Success criteria, which is the criteria we determined would satisfy the unit being complete.
  + Sign-off for completion, which displayed when the manager looked over and signed-off for the different work units.

1. Results Section

*Key Features of Final Product*

Throughout the course of the semester, our team completed three bugs and eleven enhancements. During Scrum Sprint 1, our team updated the main menu, edited the How to Play section, and updated the environmental obstacles. Before any enhancements were done, the player would only be able to select an option on the main menu screen using the arrow keys on the keyboard. For updating the main menu, our team decided to add a feature where the player can choose any option on the main menu with their mouse. We felt this was easier and faster for the player to pick an option they wanted to select. One of the sections on the main menu contained a “How to Play” section where there were instructions about how to play the game. This section was very unorganized and left out a lot of important information for the player to know about the game. Our team decided to add instructions to this section that would benefit the player. The last enhancement done in Scrum Sprint 1 was updating the environmental obstacles throughout the game. While users played the game, it was difficult to know what objects were obstacles and what were not. We found this situation happening with every user that played the game, so we felt it was an important thing to change. Our team produced the idea to add red lining around any environmental obstacle and add text signs to help the user while playing. To do this, we made new tile sets that contained images of trees with red outlines and a text sign that included an up arrow. The red outlined trees replaced the regular trees so the player knows that the avatar cannot travel past the tree. We added the arrow text sign in front of the tree so the player can recognize that they need to move upwards.

In Scrum Sprint 2, we completed important bugs and enhancements including fixing the level 2 bug, fixing the arrow key loop, and adding a new level. One of the most important tasks was fixing the bug in level 2. There was a point in the level where the avatar was not able to move past a certain point. This made it impossible for any player to complete level 2 and move on with the game. After fixing this bug, players were able to move past the point of stoppage and continue with the game. Since there were only two levels in the game, due to the level 2 bug, our team wanted to add a new level after the completion of the bug. To add a level 3, we made a new map in the map editor and designed the level through the map editor. We then coded the location of enemies and obstacles throughout the level. We felt the addition of level 3 would make the game enjoyable for the player. We also fixed the bug that occurred on the main menu. If the player wanted to choose an option on the main menu with their down arrow key and arrived at the last option, the arrow key would loop back to the first option. However, this did not happen for the up-arrow key. When the player used the up-arrow key, it did not loop to the bottom option, instead it went on forever. We wanted to fix this bug so if the player wanted to choose an option with the arrow keys, it was easy, working, and accessible.

In Scrum Sprint 3, our team completed 3 enhancements and 1 bug. This consisted of updating the pause button, changing the game fonts throughout the whole game, adding a new tile set, and fixing the music loop. At the beginning of the Scrum Sprint, we were unaware there was a pause button but after searching through the game, we found there is a pause option. If the player pressed the “p” key on the keyboard, the game would pause. Our team felt that this way of pausing the game was inefficient, so we wanted to update this. Now, players can press the “esc” button to pause the game. Our team also made a pause button that is located at the top right corner. When the player presses the button with their mouse, the game will pause, and the level timer will stop. When the player presses the button again with their mouse, the game will resume, and the level timer will pick up where it left off. Throughout the whole game, the font and the font colors were inconsistent. Our team wanted to change this, so the game was aesthetically pleasing. We changed the fonts on the main menu screen, on the “Credits” screen, “How to Play” screen, and “Choose an Avatar” screen. For future levels, our team wanted to create a dark theme, so we created a new tile set. Before our team fixed the music loop, the music in the game would stop after playing for about 2 minutes and 30 seconds. We wanted the music to play the whole duration of the game, so we made the music loop many times until the game is finished.

In the final sprint, Scrum Sprint 4, our team added two new levels, changed the level timer, updated the losing life graphic, and updated the “How to Play’ section. Our team added two new levels, level 4 and level 5. We wanted each new level to get harder. Level 4 consisted of a half-light and half dark theme with many enemies and obstacles. Level 5 consisted of a fully dark theme level with many obstacles that the player must overcome. Originally, the level timer in the game would count up but we wanted to change the timer, so the player had a certain amount of time to complete each level. The level timer is now changed so the player gets 2 minutes for each level. We also updated the graphic for losing a life. Before, the number of lives was stated in the top right corner and every time a player lost a life, the counter would decrease. Now, the number of lives is represented by three red hearts. When a player loses a life, the heart turns black. All three black hearts mean the player has lost. The last enhancement in Scrum Sprint 4 was updating the “How to Play” section. We learned and added many things during this Scrum Sprint that we needed to update the player about. This semester allowed our team to accomplish many goals we had set for the game.

*Future Enhancements*

|  |  |
| --- | --- |
| Enhancement | Description |
| Water Effect | As of now the water has no purpose, it is just a part of the background. It would be more entertaining if the water was animated so if the player jumps into it, they must restart the level completely. |
| More Levels | The addition of the new tileset allows future users to add new levels with different themes and obstacles. |
| Walrus Interaction | Currently, the walrus only says “Hello” when the player presses the space bar. It would be more entertaining if the walrus talked more or interacted with the player. |

*Key Contributions*

|  |  |
| --- | --- |
| Member | Contributions |
| Humna Hanif | * Update “How To Play” section * Updating Level 2 map layout * Creating Level 3,4,5 map layout * Fixed Level 2 bug * Fixed music loop bug |
| Andrew Matos | * Added outlines to the environmental objects * Creating a mouse class for project * Coding new level timer system * Fixed level 2 bug * Coding play/pause button |
| Jordan Mayo | * Creating mouse class for project * Creating new tileset sprite sheet * Coding losing life graphics & sprites * Fixed Level 2 bug * Coding play/pause button and created sprites |
| Julia Woeste | * Fixed arrow key loop * Updating Level 2 map layout * Creating Level 2,4,5 map layout * Fixed Level 2 bug * Update “How To Play” section |

1. Archive

Every version of the project, before and after each commit/enhancement, is stored in our team’s shared GitHub. Therefore, the finalized version of the game can be downloaded from the site to be worked on by future teams.

Zip File: hackstreetBoys.zip

The zip file includes the documentation for this semester.

|  |  |  |
| --- | --- | --- |
| Document | Path | Description |
| Fall 2021 Bug Report | hackstreetBoys/docs/BugReport/fall-2021-updated-bug-report | Discusses all the current bugs in the game. |
| Fall 2021 Enhancement Ideas | hackstreetBoys/docs/EnhancementIdeas/fall-2021-enhancement-ideas | Discusses ideas of enhancements the next team can implement in the game. |
| Mouse Detection | hackstreetBoys/docs/GameEngine/GameEngineSubSections/mouse-detection | Discusses the newly implemented mouse class which helps detect the usage of a mouse. |
| Fall 2021 Game Overview | hackstreetBoys/docs/GameOverview/fall-2021-game-overview | Discuss all features of the game. |
| How to Run Program | HackstreetBoys/docs/HowToUseThisSite/how-to-run-program | Discusses how to install and run the program. |
| Final Report | hackstreetBoys/FinalReport | Provides details on work completed during the semester. |

GitHub: <https://github.com/humna-hanif/hackstreetBoys.git>