2-Dimensional Physics Simulation Environment (Sandbox)

Software Design Document

Branden Stahl

10/13/2023

CS 225, Spring 2023

Embry-Riddle Aeronautical University

Daytona Beach campus

1 Aerospace Boulevard

Daytona Beach, FL 32114

Table 1: User Story Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **User**  **Story ID** | **User**  **Story** | **Completeness**  **Criteria** | **Effort**  **Estimate**  **(hours)** | **Priority** | **Worked in**  **Sprint**  **(Estimated)** |
| 1 | As a user I want to be able to create new shapes | The user will be given a menu on right click to spawn in a shape of whatever type when not right clicking on a shape. | 2 | 3 | 1 |
| 2 | As a user I want to be able to remove shapes | The user will be given the option to remove a shape if right clicking a shape. | 2 | 5 | 0 |
| 3 | As a user I want to be able to move shapes | The user will be able to click and drag shapes to move them, with velocities applied appropriately. | 3 | 4 | 0 |
| 4 | As a program designer I want to simulate 2d physics in an appropriate and realistic way | The outcomes of the program are mathematically **provable** to be correct following known physics formulas. | 10 | 1 | 5 |
| 5 | As a program designer I want to provide different shape options to the user | The user has the ability to create different shapes. | 3 | 2 | 1 |
| 6 | As a program designer I want to provide an accurate GUI layout that ensures the program can be navigated easily | There will be a comprehensive UI that will allow the user to interact accordingly with the program. | 15 | 1 | 3 |
| 7 | As a user I want to be able to save simulations to a file | The user will have the ability to save the simulations to a file. | 2 | 3 | 0 |
| 8 | As a user I want to be able to reload simulations from a file | The user will be able to open simulations from a file. | 2 | 3 | 0 |
| 9 | As a program designer I want to be able to easily edit various constants and settings for the program externally from the code. | There will be 2 DAT files embedded within the project that will be able to store data for the programs use. | <1 | 1 | <1 |
| 10 | As a user I want there to be a menu for interacting with the entire program. | There will be a ‘main menu’ screen that allows the user to edit settings and chose to launch either from a file or new. | 10 | 1 | <1 |

Table 2: Sprint Work Summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Sprint** | **Backlog** | **In Work**  **This Sprint** | **Completed**  **This Sprint** |
| 1 | P3 | P3 | P4 |
| 2 | P4 | P4 | P5 |
| 3 | P5 | P5 | P6 |
| 4 | P6 | P6 | P7 |

Table 3: Weekly Remaining Effort Estimate (Burn Down Chart)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Start\*** | **Nov. 6** | **Nov. 13** | **Nov. 20** | **Nov. 27** | **Dec. 4** | **Dec. 11** | **End** |
| Planned | 7.5 | 7.5 | 7.5 | 5 | 7.5 | 7.5 | 7.5 | 50 |
| Actual | 7.5 | 3 |  |  |  |  |  |  |