René Steeman

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| What I did | How long I worked on it in hours |
| Redone graphics engine structure | 3 |
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| Create a new 3D engine |  |
| Setting up libraries (using Gradle) | 2 |
| Allowing the use of vertices and showing a triangle | 2 |
| Adding general shader code and allowing for colors to be used | 1 |
| Adding textures | 1 |
| Adding 3D camera and required linear algebra foundation | 2 |
| Loading 3D models | 3 |
| Adding lights, per-pixel lighting and specular lighting | 3 |
| Adding a simple terrain system | 3 |
| Allowing for transparency in textures | .5 |
| Allowing for multiple textures to be used on the terrain | 1 |
| Adding camera movement | 1 |
| Added 3rd person camera system, including camera movement (move around the ball and zoom) | 3 |
| Added the option to set the height of the terrain | 3 |
| Adding collision detection for the terrain | 3 |
| Adding a click to terrain coordinate system | 4 |
| Added anti-aliasing and anisotropic filtering | 1 |
| Skybox | 2 |
| Added simple flat water | 1 |
| Added reflection and refraction to water | 2 |
| Added water ‘movement’ effect (ripples) | 1 |
| Added Fresnel effect to the water | 1 |
| Added normal map to the water | 1 |
| Optimizations | 4 |
| Reworked terrain generation to be more modular | 4 |
| Prevent the camera from clipping trough the terrain | 4 |
| Real-time terrain texturing (editing the texture of vertices in an area in real-time) | 10 |
| Terrain save/load system (including materials and trees) | 10 |
| Real-time edit mode (use a brush to edit the terrain type and click for adding/removing trees) | 6 |
| Added tree placing system | 3 |
| God mode for letting the ball fly for testing | 2 |
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| Created 2D rendering engine |  |
| Allow for images to be displayed on top of the 3D rendering | 3 |
| Add text support | 3 |
| General UI element support (interfaces and template for other UI elements) | 3 |
| Basics for the slider (support for multiple textures per UI element, the slider itself without movement, the function for determining the value of the slider) | 3 |
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| Create classes for 3D objects (ball, goal, tree, trees) so we can keep track of them throughout the program | 3 |
| 3D UI system (shoot direction indicator and ball reset preview) | 5 |
| 3D objects and textures rework (ball, flag, trees) | 8 |
| JUnit support | 2 |
| Helping team members on various problems (physics, UI, bot, setting up the project, etc.) | 30 |
| Creating team charter | 3 |
| Leading meetings | 16 |
| Creating the planning | 4 |
| Writing the agendas | 4 |
| Creating the presentation | 10 |
| Creating this document | 2 |
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Total: 186,5

Matthijs Kusters

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| What I did | How long I worked on it in hours |
| Physics |  |
| Research on how to implement collision (for phase 3) | 3 |
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| * Classical 4th-order Runge-Kutta Solver |  |
| Research on how to implement a second-order multivariable system. | 4 |
| Research on the *Classical 4th-order Runge-Kutta Solver*. | 2 |
| Implementation of the *Classical 4th-order Runge-Kutta Solver*. | 8 |
|  |  |
| * Second-order Verlet Solvers |  |
| Implementing non-static methods for the Vector2d class | 2 |
| Research on the *second-order Verlet Solver*. | 2 |
| Implementation of the *second-order Verlet Solver*. | 2 |
| Research on the *second-order Velocity Verlet Solver*. | 2 |
| Implementation of the *second-order Velocity Verlet Solver*. | 1 |
|  |  |
| Implement maximum velocity bound in all solvers (excl. Euler Solver). | 1.5 |
| Added bounds such that the ball cannot leave the course for all solvers (excl. Euler Solver). | 0.5 |
| Added winning condition to all solvers (excl. Euler Solver). | 0.5 |
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| Graphics Engine |  |
| Help with making the buttons and slider | 3 |
| Make code to convert the (double) velocity input to the velocity vector | 1 |
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| Fixed typos, increased readability and added documentation in a couple of java files | 2 |
| Add formulas for the solvers and the references used to implement the solvers to the presentation | 0.5 |
| Preparing and processing the minutes | 1 |

Total: 36

Aaron Schapira

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| **What I did** | **How long I worked on it** |
| **Setting up the project** |  |
| Trying to set up the project on mac, fix the bug… | 6 hours |
| Setting up the project on an old computer (Download Java, IDE, Gradle) | 2 hours |
| **Working on the Bots** |  |
| Research on the bot (for naïve bot) | 3 hours |
| Research on the bot (for Brute Force) | 2 hours |
| Implementing the Naïve Bot | 5 hours |
| Implementing the brute force Bot | 2 hours |
| **Help others** |  |
| Help creating the old Input-Output Module | 1 hour |
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| Total in hours | 21 hours |