René Steeman

What I did	How long I worked on it in hours
Redone graphics engine structure	3
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

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
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

Total: 186,5

Matthijs Kusters

What I did	How long I worked on it in hours
Physics	
Research on how to implement collision (for phase 3)	3
• **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
Graphics Engine	
Help with making the buttons and slider	3
Make code to convert the (double) velocity input to the velocity vector	1
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

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
Total in hours	21 hours

Jean Janssen

What I did	How long I worked on it in hours
2D Graphics engine	
Research on how the specific elements of the engine should function and can be implemented as well as watching turotials.	6
Creating the font-rendering and making it compatible with the TextMaster	4
Creating the framework for the button.	4
Creating textures and designs	0.5
Adding compatibility with JFileChooser	1
Improved the slider so that it can move and read in values	3
General brainstorming and fixing errors with help from other team members	5
Working together with Matthijs on the slider	3
Make code to convert the (double) velocity input to the velocity vector	1
Fixed typos, increased readability and added documentation in a couple of java files	2
Preparing and processing the minutes	1

Total 30.5

Haoran Luan

What I did	How long I worked on it in hours
Sound System	
Learning the 3D game development LWJGL 3	5

Working on the sound system	4

Total 9