

RoboTanks Specifications Document

Version 1.2 - Feb 15, 2016

Overview

Create an online system where users can code tanks and watch them fight in an arena.

Semester Goal

Finish the **Minimum Viable Product** outlined below. Also do as many of the **Extra Features** as possible.

Semester Milestones

Milestone	Milestone Goal
Review Requirements	Create a specification and game rules documents that everyone in the group agrees with
Development Environment	Every developer has a working development environment and has committed code
Design Complete	Project architecture has been established and is accepted by the group of developers
Feedback Loop	People outside our group (preferably freshmen in the CS program) are using the product and giving feedback
Code is Complete and Tested	Code is in a working, usable state and has been tested for bugs and security holes. This includes all the code for the MVP below.
Product Deployed	Product is available on the web for open public use

Minimum Viable Product

1. User Management - a user should be able to...

1.1 Register:

- 1.1.1 - Create a new user, setting the username and password
- 1.1.2 - Check if a username has already been taken

1.2 Login:

- 1.2.1 - Login using their username and password
- 1.2.2 - See a message if they have the wrong username or password

2. Tanks - a user should be able to...

2.1 Create tanks:

- 2.1.1 - Create a new tank and give it a name
- 2.1.2 - Choose the tank's class out of given options
- 2.1.3 - Upload code for that tank
- 2.1.4 - Check the uploaded code to see if it will compile

2.2 *Edit* tanks:

- 2.2.1 - Download the code for one of their tanks in it's original form as they uploaded it
- 2.2.2 - Change the tank's class
- 2.2.3 - Replace a tank's code with a new upload
- 2.2.4 - Check the uploaded code to see if it will compile

2.3 *Delete* tanks:

- 2.3.1 - Delete a tank

2.4 *Manage* tanks:

- 2.4.1 - See a list of all their tanks
- 2.4.2 - Rename a tank
- 2.4.3 - Look at the source code for a tank (without downloading it)

3. **Games** - a user should be able to...

3.1 *Create* games:

- 3.1.1 - Create a new game and give it a name

3.2 *Join* games:

- 3.2.1 - See a list of games with open spots
- 3.2.2 - Join an open game with a selected tank

3.3 *Watch* games:

- 3.3.1 - See a list of games they've joined
- 3.3.2 - Watch a game:
 - 3.3.3 - Watch the movements of each tank in the game over time (animated)
 - 3.3.4 - Watch the movements of bullets over time (animated)
 - 3.3.5 - Watch the health of each tank throughout the game
 - 3.3.6 - Change the playback speed of a game ("slow motion" vs. "fast forward")
 - 3.3.7 - Discern between their tank and enemy tanks (color coordination)
 - 3.3.8 - See any exceptions/errors generated by their tanks during the game

4. **Coding Interface** - a tank should be able to...

4.1 *Rotate*:

- 4.1.1 - Rotate a full 360 degrees

- 4.1.2 - Rotate in increments as small as 90 degrees
- 4.1.3 - Rotate to one of the 4 absolute directions (N, E, S, W)
- 4.1.4 - Rotate relative to current direction (Clockwise by 45, Counterclockwise by 90, etc.)

4.2 Move:

- 4.2.1 - Move forwards or backwards
- 4.2.2 - Move a certain number of grid spaces ("move forward 4")

4.3 Shoot:

- 4.3.1 - Shoot straight forward in the direction it's facing

4.4 Wait:

- 4.4.1 - Wait until their next turn

4.5 Use action points:

- 4.5.1 - Use action points by choosing which action to do

5. Manual - a user should be able to...

5.1 Tank interface:

- 5.1.1 - See a list of possible tank moves
- 5.1.2 - See how many action points each move will cost for each tank class
- 5.1.3 - See examples of tanks that work

5.2 Game mechanics:

- 5.2.1 - Look up the rules for the game
- 5.2.2 - Look up rules for how action points are used

6. Scoring - a user should be able to...

6.1 Personal record:

- 6.1.1 - See the number of games they've won
- 6.1.2 - See the number of games they've lost
- 6.1.3 - Total tanks killed
- 6.1.4 - Total tanks lost

6.2 Tank record:

- 6.2.1 - See the number of games a tank has won
- 6.2.2 - See the number of games a tank has lost
- 6.2.3 - See the number of other tanks a tank has killed
- 6.2.4 - See the number of times a tank has been killed

7. Security - a user should not be able to...

7.1 Coding:

- 7.1.1 - Create any additional files on the server
- 7.1.2 - Delete anything on the filesystem on the server
- 7.1.3 - Get access to a shell on the server

7.2 Endpoints:

- 7.2.1 - See the code for other users' tanks
- 7.2.2 - Submit code for other users' tanks

Extra Features

- 8.1 In-Browser Code Editor - A user can code online without downloading the code. The in-browser editor provides syntax highlighting and autocomplete.
- 8.2 GUI Editor - A user can code online using a GUI interface. They can drag and drop blocks of code and logic to make a complete program.
- 8.3 Fully customizable tanks - A user can make any combination of tank with different guns, tank bodies, and treading.
- 8.4 Items - Items will be placed randomly on the map throughout the game. Tanks may run over these items for added health, added firepower, or to freeze enemy tanks
- 8.5 Tanks drop things - A tank will drop items when it dies. Other tanks may pick these items up.
- 8.6 Fog of war - A tank will only receive information for other tanks that are close to him. The user will be able to see how far the tank can see by blacking out the rest of the arena while watching the game.
- 8.7 Destroy obstacles - A tank will be able to shoot down walls. A tank will be able to shoot holes in the map and tanks may fall into those holes and die.
- 8.8 Talking tanks (log messages during turn) - A tank will be able to log messages while running its code. The user will see these log messages displayed at the appropriate time while the game is playing.
- 8.9 Test tanks immediately against preset tanks - A user will be able to test their tank immediately in the browser after uploading against one other preset tank.