# Tanks 2-D

Architectural Design

1. **Introduction and Context**

Tanks 2-D will be a distributed game adapted from the online flash player game (https://www.mathsisfun.com/games/tanks.html). The basic premise is that each player controls a tank and can control their tank's movement, firing angle, and firing power. Each tank starts with the same health value, and taking damage reduces the health. The health value is also the max limit of their fire power, so as health goes down, so also does the maximum range they can fire at opponents. A player can choose to join a game and the Registry will select a game for them to join, assigned to a Game Manager to "manage" the game. Key features include:

* Players can request a game and the Registry will assign them to a game with a Game Manager for that game
* Tanks will have player-controlled firing angle, firing power, and movement
* Tanks will also have a limited supply of fuel, parachutes, and teleports
* Each tank will have a starting health value of 100, and lose health from bullet attacks
* The health value is also the maximum firing power for the player (ex. So a health value of 50 will mean the maximum fire power is 50% of when the tank had 100 health)
* There can be a maximum number of 4 players per game
* Upon players eliminating all other opponents, that player is considered the winner
* If there are only two tanks left, and their range of fire is not able to reach each other, the round ends in a draw

1. **Users and their Goals**

The game is established with two users for the system, the administrator and the player. The administrator's goals include:

* Start up the registry
* Log into the system
* Repairing errors

The player's goals include:

* Requesting a game to join
* Reduce all opponents' health to zero
* Play until ready to quit

1. **Major Components and Their Relationship**

The major components:

**The Registry:**

The Registry oversees organizing the players into various games, each with their respective Game Manager. The Registry will handle verifying that the Player is still connected to the game they are in. If the Player becomes disconnected for over the timeout period, then the Registry will remove them from the game they were in and informs the Game Manager to delete them. If a Player requests to start a game and there isn't an open game available, then the Registry will generate a new game, with a new Game Manager, and add the Player to that one.

**The Game Manager:**

The Game Manager handles all the Player requests for performing actions and moving. It also tracks player turn and verifies if the moves and actions requested by the Player are valid. The Game Manager will handle removing players from their game if they become disconnected for too long from the game. If a single Player remains alive, the Game Manager declares them the winner and prepares to start another round for the game if possible.

**The Player:**

The Player is the interaction of the user with the game system. A Player can give themselves a username as they request to join a Tanks 2-D game. Upon joining a game, the Player then fires cannons at their opponents to win by reducing their health to zero. Once accomplished they may move on to the next round or quit the game where it's at.