Space Battles

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Game Overview

Space Battles is a retro-style, 2D, top-down space arena game. The player's goal is to level up, upgrade their ship or base, and destroy other players' base to be the last one standing. Players gain experience by mining asteroids or defeating other players and their minions. After accumulating enough experience, they can upgrade their ship or base stats and occasionally select a special ability to use in-game.

The game takes place in space, where asteroids and wall tiles populate the arena. Assets will be fairly simplistic shapes with a restricted color palette. The screen will have a low resolution filter to give the game a sharp pixelated look. The arena is larger than the screen, so a camera will have to follow the player and reveal more of the world as they move throughout the scene.

The ship moves using thrusters, allowing it to travel only in the direction it's facing. Although true space lacks friction, the player navigates a low-friction plane similar to walking on ice for the player's convenience. The map is filled with drifting asteroids, most of which act as obstacles that players can destroy by shooting. Occasionally, a special asteroid will appear which drops experience when destroyed.

Experience can be used to upgrade player stats, including defense, speed, and attack, as well as base stats like defense, minion level, and minion production. At certain experience milestones, players can choose from several abilities to permanently shape their play style, with a player only being able to choose up to two abilities per game. Abilities can be activated using key bindings, and after a cooldown period, they will reset for players to use again.

The arena will be represented using a tile map, which will provide static walls that objects can collide with. All players will have a default gun that shoots in the direction their ship is facing. The bullets will move slow enough to allow other players to dodge them. Bullets will be able to damage players, minions, enemy bases, and asteroids.

Each player will have a home base that acts as a respawn point for them and their minions. Minions are essentially smaller versions of the player that will follow and aid the player in combat. Minions do not have any objectives of their own, so the player must lead them into battle.

When the player opens the game, they can choose to host or join a match. If they choose to host, they enter a lobby where they can control their ship in a small, static arena while waiting for others to join. As players join, the lobby fills up, and the host can start the game once there's at least one other player. In the main arena, players battle to destroy each other's bases; the last player standing wins. After the match, the game resets and brings the player back to the host-or-join screen.

This game combines the classic feel of Asteroids with the competitive, upgrade-driven gameplay of Diep.io. The low-friction movement makes combat and navigation tricky yet satisfying, while the leveling system allows players to customize their ship and base which adds a layer of strategy to each match. Players can choose how to spend their experience and control minions, allowing them to develop fun and unique tactics to defeat other players.

Development Strategy

We'll begin this project by using the basic libGDX gradle template from gdx lift-off, which can be found [here](). We aim to have a Git repository containing this document and the updated template ready by November 4th to maximize our development time.

Milestones

- November 11-13: Ship controls, Host & Join logic, and Player Lobby. This will include a basic server to stream player positions.
- November 17 (Group Status Report): Game Start (send players to large arena), Camera Movement, Player Shooting, Player Base
- November 25: Asteroids & Wall Tiles, Minions, Upgrade System
- December 6: Abilities, Final Polish (art, sound design, win screen, etc.)

Contributions

- Micah: Host & Join Logic, Server & Client Architecture, Networking various features, Game Start, Asteroids & Wall Tiles
- Noah: Ship controls, UI (buttons, menus, etc.), Player Lobby screen, Camera Movement, Minions, Final Polish
- Both: Player Shooting, Player Base, Upgrade System, Abilities, Art & Sound

High Bar

Given the low-bar requirements, our game supports 2–4 players, with no single-player mode. However, a realistic high-bar goal would include a single-player mode where the player defends their base against waves of minions and other enemies, eventually targeting the minion horde base to win.

Additionally, more complex base-building mechanics could enhance gameplay. For instance, players might place turrets or wall tiles around their spawn area to strengthen their defenses.

Low Bar (Bolded words match complexity rubric)

- **Realtime** Player Ship Controls
  - Players will be able to control their ship using basic WASD controls: A and D to rotate, and W to thrust forward. Players will also be able to shoot various entities by pressing a key (specific button undecided).
- Waiting Lobby
  - When a player chooses to host, they enter a waiting room that fits on the screen, eliminating the need for camera movement. As other players join, they appear in the waiting room, where everyone can move their spaceship and shoot without consequence until the host starts the game with at least two players present.
- **Networked / Multiplayer** Capabilities
  - Each match will have all players in one arena, all playing on their own devices. All entities and events will be streaming to each client for a consistent multiplayer experience.
- Battle Arena with **Scrolling World**
  - 2-4 players will be put into a large arena bigger than the screen. A camera will have to follow the player to reveal more of the world.
- Asteroids & Wall Obstructions
  - Asteroids will drift through the scene, damaging players on collision, with some granting experience points when mined. Static wall tiles shape the arena and offer additional cover for players.
- Player Base
  - Each player will have a respawner station that will respawn the player and their minions on death. The player will lose the match if killed after their respawner was destroyed.
- Minions
  - Player bases will slowly spawn minions to aid the player in battle. Minions follow the player and attack enemies and what the player fires at.
- Ship & Base Passive Upgrades
  - When players level up, they can distribute points to upgrade passive attributes and base stats. These upgrades include player defense, attack, speed, base defense, minion stats, and minion production.
- Abilities (**Powerups**)
  - After leveling up sufficiently, each player can choose two of the following timed abilities during the match (subject to change): Dash, Invisibility, Mega Gun (rapid fire), Force Field, Bomb, or Guard Summon (enhanced minions).
- **Art** & Sound

- ○ The game will feature a retro, low-resolution aesthetic and sound effects. Additional visual polish will include various particle systems.
- UI (Transition screens, buttons, menus, progress bars, etc)
  - ○ Throughout the game, there will be several ui elements such as various title screens for winning and losing conditions, Host and join menu, and upgrade menu.