Game Design Document (GDD): Independence Day

### Concept Overview

"Independence Day" is an arcade-style game where players control a spaceship to defend Earth from waves of alien invaders. The game challenges players to eliminate alien ships while dodging their attacks. The objective is to survive as many waves as possible and achieve the highest score.

### LEVEL DESIGN

#### Stage Layout

The game is divided into three stages: Easy, Medium, and Hard. Each stage introduces progressively challenging alien waves and gameplay elements:

1. **Easy Stage:**
   * Alien ships move towards Earth at a slower pace.
   * Few alien ships per wave, no firing capability.
   * Visual: Bright and inviting space backdrop with minimal visual distractions.
2. **Medium Stage:**
   * Alien ships move towards Earth faster in a zigzag pattern.
   * More alien ships per wave, with minimal firing capability.
   * Power-ups appear frequently to help player get familiar with the mechanics.
   * Visual: Darker space background.
3. **Hard Stage:**
   * Alien ships move towards Earth at high speed and occasionally change direction unpredictably.
   * Large numbers of alien ships per wave, with rapid and coordinated firing patterns and requires multiple hits before it gets destroyed.
   * Rare power-ups, requiring strategic play to survive.
   * Visual: Intense space backdrop with warning effects as aliens get closer.

#### Winning and Losing Conditions

* **Winning:** Players clear a wave by destroying all alien ships before they reach Earth.
* **Losing:** The game ends if any alien ship reaches Earth or if the player's spaceship is destroyed.

### GAME MECHANICS

#### Player Controls

* Move the spaceship left and right using arrow keys or A/D.
* Fire the laser cannon using the spacebar or a mouse click.

#### Hazards and Interactions

* Alien ships:
  + Move in a zigzag pattern and progressively speed up as they approach Earth.
  + Some alien ships fire projectiles, requiring players to dodge.
* Power-ups:
  + **Rapid Fire:** Increases firing speed temporarily.
  + **Missile:** Instantly destroys alien.
  + **Shield:** Temporarily protects the spaceship from enemy fire.

#### Earth Defense Mechanic

* The game ends if any alien ship reaches Earth. Players must destroy all alien ships before they descend to avoid losing.

### USER INTERFACE (UI)

#### Display

* **HUD Elements:**
  + Player health/lives.
  + Score.
  + Stage Level
  + Active power-ups.
* **Menus:**
  + Start screen with options for Start Game, Instructions, and Quit.
  + Game Over screen displaying the final score and leaderboard.

### VISUAL AND AUDIO DESIGN

#### Visual Style

* Vibrant 2D art.
* Distinct designs for different types of alien ships, power-ups, and the player spaceship.
* Explosions and effects for destroyed alien ships and power-ups.

#### Audio Design

* **Background Music:** Dynamic music that intensifies as waves progress.
* **Sound Effects:**
  + Laser shots, alien ship destruction, power-up collection, and enemy fire.

### GAME PROGRESSION FLOW

#### Start Screen:

* Displays the game title with Start, Instructions, and Quit options.
* Instructions provide an overview of controls and objectives.

#### Level Start:

* Players is always at the bottom of the screen as the first wave of alien ships appears.
* A brief countdown signals the start of the level.

#### Level Complete:

* After clearing a wave, players receive a score breakdown and advance to the next wave.
* A brief intermission allows players to prepare for the next challenge.

### SCORING SYSTEM

* Points awarded for destroying alien ships, with bonuses for faster wave completion.
* Special bonuses for collecting power-ups.

### IMPLEMENTATION CONSIDERATIONS

#### Tools and Technologies

* Game Engine: GEX Game Engine (SFML).
* Programming Language: C++.
* Platforms: PC.

#### Key Features to Implement

1. Smooth player controls for precise movement and firing.
2. Responsive alien behavior with progressively faster speeds.
3. Power-up system with clear visual and gameplay effects.
4. Scoring and timer mechanics integrated into the HUD.
5. Dynamic wave progression and increasing difficulty.
6. Polished visuals and engaging audio design.