**Technical Design Document for**

**"Galaxy Impact"**

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## 1. Introduction

"Galaxy Impact" is a 2D space shooter game designed for PC gaming enthusiasts, developed in C++ using the SFML (Simple and Fast Multimedia Library) for graphics and multimedia handling. This document outlines the technical aspects of the game's development, including architecture, mechanics, assets, and implementation details.

## 2. Game Architecture

### 2.1 Platform

Developed for PC platforms, including Windows, macOS, and Linux.

### 2.2 Engine

SFML (Simple and Fast Multimedia Library) version 2.6.1 is used for graphics, audio, and input handling.

### 2.3 Programming Language

C++ is the primary programming language for game logic and mechanics implementation.

## 3. Gameplay Mechanics

### 3.1 Player Controls

Directional movement: Arrow keys or WASD keys

Shooting: Enter key

Launching missiles: Spacebar

### 3.2 Enemy AI

Regular enemies exhibit diverse attack patterns, including linear and non-linear movements. Boss encounters feature complex attack strategies and multiple phases.

## 4. Art Assets

### 4.1 Visual Style

Classic 8-bit graphics combined with modern visual effects using SFML. Spaceships, enemies, and environments designed to evoke nostalgia while maintaining visual appeal.

## 4.2 Sound Design

Dynamic soundtrack and sound effects implemented using SFML audio module. Sound effects include player and enemies weapon sounds including laser blasts, enemies special abilities and ambient noises of the galactic environment.

## 5. Game Structure

### 5.1 Levels

Structured progression with increasing difficulty. Each level presents unique challenges, enemies, and environments.

### 5.2 Narrative

More challenges and enemies arise as player progresses through levels, providing a sense of purpose and excitement emotions.

## 6. User Interface

### 6.1 Main Menu

Options for starting the game, resuming progress, restarting, and viewing controls.

Intuitive interface design for seamless navigation implemented with SFML graphics module.

### 6.2 In-Game HUD

Displays player health, current weapon availability, and total lives using SFML rendering.

## 7. Implementation Details

### 7.1 Physics

Simple physics for spaceship movement and collisions implemented using custom helper functions and SFML tools.

### 7.2 Scripting

C++ classes and functions for implementing gameplay mechanics, AI behavior, and user interface interactions.

## 8. Conclusion

"Galaxy Impact" brings classic arcade charm to modern PC gaming with its engaging gameplay mechanics, old school 8-bit stunning graphics, and immersive sound design. Developed in C++ with SFML, it promises to be a thrilling experience for players seeking an unforgettable journey through space.