**System Design Document**

**Turn-Based Combat Game**

**The Flying Mongooses**

**4601 Mid Rivers Mall Dr**

**Cottleville, MO 63376**

**Date**

**6/19/21**

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**Introduction**

Our team will create a fun to play and feature rich turn-based combat game. The game will be created using the Unity game engine and developed using the C# language. The team will work together on all aspects of the games design and development over the 8-week period running from 6/12/21 until 7/31/21. During this duration, many on our team will have their first experiences not only with game development, but with Unity and C# sharp as well. This will help us become better developers as a while, as well as strengthen our team-oriented skills. This project is managed by Samuel Maynard, and the developers are Shane Callaway, Thomas Mattei, Alton Stillwell, Kaitlyn Staats and Evan Colyer.

**Purpose**

The purpose of this project is to create a turn-based combat game that can be both engaging to play and play itself. In this we aim to provide a game that is both challenging and has replay-ability, with the ability to compare one’s own skill to others via online scorekeeping and leaderboard systems.

**System Overview**

The game will be developed in the Unity game engine using the C# language. The database will be written with Google Firebase.

**Design Constraints**

The main constraint for this project is the learning curve of Unity – each of the team members has to learn how to integrate our code both with the game engine and with each other’s code. Other constraints include art and game style, we’re keeping things simple with a 2D game that is turn based, which requires less in-system coding and tracking. The other major constraint is time as designing and implementing a game with online services is a large task to accomplish within an 8-week period, though not impossible.

**Roles and Responsibilities**

The responsibilities of the team are as follows:

**Samuel Maynard**: Project Manager and art direction

**Shane Callaway**: Assist with UI design and function, basic level combat, player and enemy stats, leveling, and balancing of combat

**Thomas Mattei**: User Interface/Menu Transitions, Assist with Online PvP

**Alton Stillwell**: Online Matchmaking (PvP) Programming, Mirror Integration, Audio

**Kaitlyn Staats**: Database design and integrating the database into unity.

**Evan Colyer**: AI programming, both for player characters and enemy non-player characters.

**Project References**

<https://www.youtube.com/watch?v=_1pz_ohupPs&t=179s>

**System Architecture**

**Hardware:** Personal Computers, Mouse Driven

**Software:** Unity Game Engine, C# background code (Running via Unity Game Engine)

Microsoft SQL (Database/leaderboards)

**Database Design**

The database will be designed in Google Firebase. The database will store the player character info, as well as the amount of kills the player character has. The kill count will be used to measure position on our leaderboard system. The data is pulled upon starting the game, and any new/changed data is uploaded to the database upon exiting the game. Design constraints mean there will be one character tied to each individual player account.

**Hardware and Software Detailed Design**

**Hardware:**

Our game is developed on a wide variety of computer systems, including desktop and laptop machines. Because of this, the hardware in use to develop our game varies greatly. Additionally, the hardware options required to run and play our game will be vast, as our game will utilize concise but capable software scripts and will use “pixel-art” assets.

**Software:**

Our game is being developed on both Windows OS computer systems as well as MacOS systems. The Unity game engine will be the base of the game, which is programmed in C#. Our backend will be developed using Microsoft SQL and Mirror, both integrated within Unity. Our game be capable of running on both Windows and Mac systems.

**System Security and Integrity Controls**

Our game is created using the Unity game engine, so the built-in integrity and security of the game engine will be utilized. Additionally, the built-in security of Google Firebase will be leveled for our game. While some basic information on the in-game characters will be stored in the database, no personal or sensitive information of the players themselves will be kept at any point.

Sponsor Acceptance

Approved by the Project Sponsor:

Date:

<Faculty Sponsor>

<Faculty Sponsor Title>

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