Project Specification Document

Mild Goose Chase (Video Game)

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Project Leader / Scrum Master: Kyle Kaminski

Professor: Dr. Baliga

Github: [GitHub](https://github.com/kylekaminski26/SeniorProject)

Slack: [Senior Project](https://app.slack.com/client/TSMG78R2M/CSMG7A1NV)

Google Drive: [Google Drive](https://drive.google.com/drive/u/1/folders/188RFAuMLaExE4ScPhyBcP8tzLbKhaVon)

**Prerequisite Notes**

1. The terms “game” and “product” in the scope of this document mean the same thing and may be used interchangeably
2. The terms “professor”, “Dr. Baliga”, and “customer” are interchangeable and mean the same thing
3. The terms “AI”, “enemy”, and “enemy AI” are interchangeable and mean the same thing
4. This document is not reflective of the finalized product and ideas may be added, changed, or removed during planning, development, and release

**Project Summary**

The purpose of this semester long senior project is to demonstrate what every member of this group has learned so far through a cumulative group effort; a *magnum opus* to our careers as college students. We decided to go with a fleshed out, algorithm-based video game to demonstrate our individual skill levels and how they can all successfully come together under one product umbrella. We plan to have many unique features to set our game apart from the rest.

**Project Goals**

Throughout the development of this product, we plan to have (but will not limit ourselves to):

* An agile methodology for development (we will have our own take on agile to better suit our needs)
* Scrum Master / Project Leader role(s)
* Developer roles
* Rigorous foundational planning before development begins (similar to user story cards in a product backlog)
* A prototype of the product ready in a timely manner (deadline to be decided during planning)
* Constant feedback with the customer (Dr. Baliga) to improve the quality of the product
* Sprints (amount of time for each to be determined during planning)
* A working and fully complete deliverable at the end of every Sprint **and** for every deadline given to us by the customer

Our team has discussed and are planning unique features and mechanics such as (but not limited to):

* Unique 2D world design using Unity
* A “player” that the user controls throughout the duration of the game
* “Dungeons” that the player can interact with
* Procedural world/dungeon generation
  + Each world and dungeon will be built with an algorithm and will be theoretically unique
* Enemy battle AI, based on a set of variables and derived variables and a set of invariants to create different characteristics. Some variables can be (but not limited to):
  + Intelligence
  + Strength
  + Mobility
  + Vitality
  + Range
  + Dexterity
  + Heath
  + Size
  + (Cone of) Vision
* An evolutionary-genetic algorithm to generate a gradient of random monsters that scale in difficulty as the player progresses through the game.
* A “Permadeath” system for the player (If the player “dies” then the game is over and must be restarted from the beginning)
* Leveling up system for both player and AI
  + Upgradable Stats and Skills
* General quality of life features and basic industry standards to make the game both familiar and more enjoyable for all parties involved
* \*\*\*Ranged enemies

**Product Features**

The final release of the product may contain all of the features below, although some may added, changed, or removed during development for known or unknown reasons:

1. **Portability:** The game will be able to work on multiple types of devices and not just one machine (Built on and for Windows machines, may work on Mac devices as well)
2. **Foundation**: the game will have a multitude of industry-standard features that many games out on the market today already have (full list to be decided during planning)
3. **Sound Design**: the game will feature sound effects for multiple events such as movement, interactions, battling, etc.
4. **Perspective**: The game will be built and displayed as a 2D top down game board
5. **Procedural Generation**: The game will feature (not limited to) rooms, enemies, and tiles that will be generated and placed using an algorithm
   1. Rooms
   2. Game board- a board of rooms (level)
   3. Level exit- how to move on to the next level
6. **Sprites:** each “item” in the game will use a sprite render for better visualization (ex. player, spike, rock, hole)
7. **Visual Feedback**: The game will feature clear visual feedback in specific situations to show the player that they completed an action or interaction (ex. swiping a sword having a blur or trail, specific enemy attacks being more pronounced than others to signify a larger damage output, etc)
8. **Player** class: The user will control a player object throughout the game. The player object may have variables like:
   1. Health (armor) system
   2. Stamina/Dexterity
   3. Mobility
   4. Strength
   5. Vitality (regen)
9. **AI** Class: The player will interact with AI objects throughout the game. The AI/enemy class may have variables like:
   1. IQ
   2. Vision
10. **Battle Mechanics**: The game will feature different battle mechanics between the player and AI
    1. Knockback (static or dynamic)

**Limitations**

The known limitations of our project include, but are not limited to:

1. The project may not work on Apple devices without dedicated porting since it is being built on Windows machines using multiple programming languages
2. The project may not include all of the ideas we initially planned during the planning phase, or many include ideas we come up with later on during development
3. Product development is currently limited to just the development team and project leader, meaning we have a limited amount of resources for playtesting and quality assurance of the product
4. The satisfaction of every user for the product may vary and cannot be accounted for in the development phase
5. The skill level of every user for the product may vary and cannot be accounted for in the development phase
6. The visual aesthetic of the artwork, sprite-work, or level design may not be visually pleasing or completely original due to lack of experience in graphic design throughout the team

**Stretch Goals**

Listed below are the additional features we would like to implement into our product, in no particular order of importance:

1. A very fleshed out player and enemy combat system that may provide different interactions based on the respective levels of the player and the enemy (ex. No battle occurs if the player is X amount of levels more than the enemy)
2. A story for the game that may include the following:
   1. Quests or objectives besides the single main objective
   2. Cutscenes
   3. Dialogue
3. Craftable equipment for the player to use
4. Dynamic Lighting