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| Technical Design Document |
| Coffee Mania |
| By William Tjang and Pasqual Fletcher |

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# Revision History Version

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| --- | --- | --- |
| **Version** | **Date** | **Description** |
| 1.0 | 14 Oct 2019 | Initial Document |
| 1.1 | 15 Oct 2019 | Added some pickup item mechanics |
| 1.2 | 16 Oct 2019 | Added UML diagrams |
| 2.0 (Alpha) | 05 Nov 2019 |  |
| 3.0 (Beta) | 19 Nov 2019 |  |

# Development Environment

## Game Engine

Unity v2018.3.8f1

## IDE

Windows Visual Studios 2017

## Source Control procedures

GitKraken, Unity Collab

## Third Party Libraries

N/A

## Other Software

N/A

# Game Overview

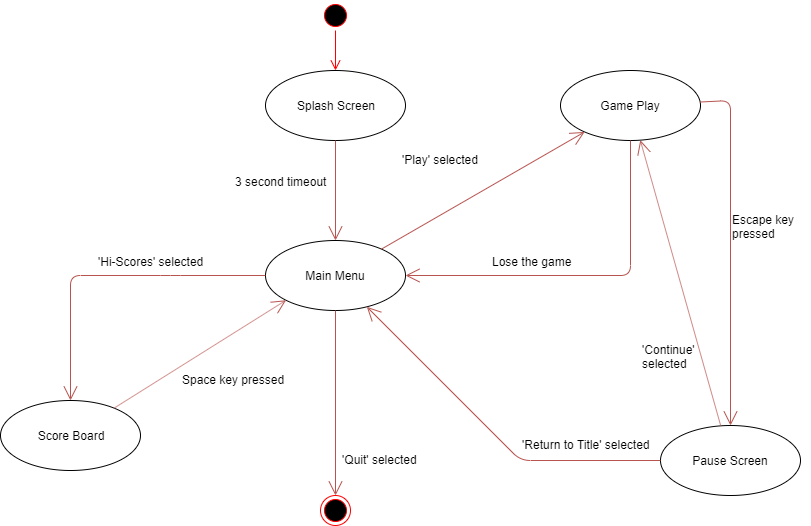
## Technical Goals

* To procedural generate the level for the endless runner as game is being played, to allow for infinite levels and game play.
* To optimize the game to run at 60 frames a second on standard hardware.
* To be played in a 3D environment with a 3D camera view

## Game Objects and Logic

|  |  |
| --- | --- |
| **Game Object** | **Description** |
| Player | Represents the controllable player character |
| Tile Set(s) | The tile sets randomly generated for each level |
| Obstacle(s) | Will cause the player to lose upon frontal collision |
| Pickup(s) | Grants a buff or debuff on the player (refer to section 8) |

## Game Flow



# Mechanics

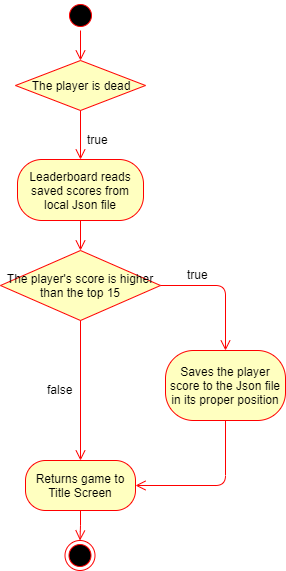
Moving

* Side to side controls
* Strafe: The player switches to an adjacent lane either left or right using the A or D keys\
* Turns: The player turns 90 degrees to the left or right using the arrow keys <- or ->
* Jump: The player jumps a certain altitude using the SPACE key
* Slide: The player slides a certain distance using the S key

Currency

* Beans: The player can spend the bean currency for various benefits in game

Leaderboard



# Graphics

The graphics will be 3D and stylized PBR art. The graphics will contain flat colours that are layered, minimal normal information, chiseled edges, bright colours, high saturation and low poly models with minimal topology.

# Artificial Intelligence

N/A – No AI plan as project does not contain AI.

# Physics

N/A – No Physics plan as project does not contain physics.

# Items

|  |  |
| --- | --- |
| **Item** | **Description** |
| Coffee Bean | Adds 1 currency to the player’s overall account |
| Sugar | Speeds up the player character and grants invincibility for 5 seconds |
| Ice Cubes | Slows down the level speed for 10 seconds (may be subject to future changes) |
| Net | Allows the player to catch all nearby coffee beans in an AoE |
| Barista Knife | Allows player to ignore the next obstacle they crash into and destroy it |
| Milk | Grants a score multiplier buff |
| Tea | Inverts the player’s control for 10-15 seconds |

# Game Flow

## ‘Mission’ / ‘Level’ structure

## Objectives

* The player’s objectives are to collect as many coffee beans by running over them, adding them to the players total, to earn rewards.
* The player’s aim is to get as far as they can through the endless runner and score high.
* Their score is calculated by how far they have traveled amongst other factors (e.g. pickups) and evaluated against a local leaderboard.

# Levels

To be updated.

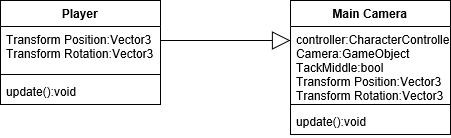
# Interface

## Menu

|  |  |
| --- | --- |
| **Option** | **Description** |
| Play | Starts the main gameplay |
| Hi-Score | Displays the leaderboard |
| Quit | Closes the game window |

## Camera

* 3rd person perspective
* Positioned slightly higher than player
* Angled slightly downwards
* Centered at the middle lane



## Controls

|  |  |  |
| --- | --- | --- |
| **KEYBOARD** | | |
| **Action** | **Command** | |
| Strafe | A (left) | D (right) |
| Turn | <- (left) | -> (right) |
| Jump | ‘Space’ | |
| Slide | ‘S’ | |

# Asset List

Characters

* Beanbo (player)
* Macino (enemy)

Terrains

* Skybox
* Foliage – Mountain x2
* Foliage – Desert x2
* Ground plane – Mountain
* Ground plane – Desert
* Cave – Mountain
* Petra – Desert
* Tree – Mountain x2
* Tree – Desert
* Bricks – Mountain
* Bricks – Desert

Pick Ups

* Coffee bean
* Milk carton
* Sugar bag
* Tea bag
* Net
* Barista knife

Obstacles

* Pillar
* Pillar (broken)
* Tree (fallen)
* Tree stump
* Tree log
* Animal bones
* Rock – Mountain x2
* Rock – Desert x2

# Technical Risks

Risks

* Having 2+ programmers in the project can lead to style and/or data structure inconsistencies
* Some pickup mechanics may not be implemented due to time limit or complexity issues
* Source control issues can severely delay the project, especially with 2+ programmers
* Importing assets provided by the artists could cause issues in the game engine (Unity)
* Designer may encounter problems understanding how the underlying mechanics operated by the scripts work, and thus causing inefficiencies in the workflow

Measures

* Pre-plan variable naming, style and data structures conventions between programmers
* Have good time management and prioritization of tasks to minimize time limit issues
* Use multiple source controls in case one fails
* Collaborate with the artists to fix art assets related issues
* Use commenting and clear variable names, as well as provide an intuitive editor interface for the scripts e.g. set variables that needs to be tweaked for fine tuning as public