**Project Brief**

Trey Gleason

Project Overview

For this assessment I am required to create a custom physics simulation and demonstrate its successful implementation within a real-time application. I will be using the slime project I have been working on in order to meet the assessment requirements

Assessment Requirements

* Static and Dynamic Rigid Bodies. My slimes, slime gate, and slime post will have dynamic rigid bodies. The player will use a kinematic/static rigidbody
* Forces being applied to Dynamic rigidbodies. The slimes will be affected by a force which makes them jump. Forces will also be applied to my slime gate whenever it needs to open or close.
* Static and Dynamic Rigid Bodies interacting with each other as expected. The player will be able to nudge slimes, causing their rotation position to change in reaction to being pushed. Slime won't be able to move the player at all if they were to bump into the player. Slimes won't be able to move the slime gate doors if inside the slime pen.
* Slime gate will use physics joints to open and close its doors
* A character(most likely the player) will have ragdoll physics so that they can fall over whenever a specific key is pressed
* Raycast will be used for selecting and interacting with slime and other objects
* Tigger system used for the slime pen to constantly keep track of the number of slimes in the slime pen
* Player will use a kinematic rigidbody character controller

Third Party Libraries

Jellybodies:

* <https://blendswap.com/blend/12614>

Ragdoll:

* <https://www.kenney.nl/assets/animated-characters>
* <https://www.kenney.nl/assets/animated-characters-2>
* <https://assetstore.unity.com/packages/3d/characters/robots/space-robot-kyle-4696>
* <https://assetstore.unity.com/packages/3d/characters/unity-chan-model-18705>

# **Underlying Mathematical Operations and Algorithms**

## **Mathematical Operations**

Using kinematic formulas for projectile physics.

# **Credits**

Trey Gleason © 2021