Assessment Submission Coversheet:  
Physics for Games   
Task 3 – Create an Advanced Physics Demonstration

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| **Course Stream:** | 10702NAT – Advanced Diploma of Professional Game Development |
| **Assessment Name:** | Physics for Games |
| **Units Covered:** | ICTGAM556 – Develop and implement physics in 3-D digital games |
| **Teacher/s:** | Jesse James Donlevy |
| **Due Date:** | 08/03/2023 |
| **Date of Submission:** | *Will be automatically recorded on Canvas* |
| **Assessment Work Location** | Canvas |

*For more information on these parts, please click on the* [***Subject and Assessment Guide***](https://aie.instructure.com/courses/1027/files/723141?wrap=1) *link in the course* ***Game Programming Year 2*** *under the subject* ***Physics for Games*** *on* [*https://aie.instructure.com*](https://aie.instructure.com) *and read the* ***2023 Subject & Assessment Guide – Physics for Games***

*and go to* ***Assessment Tasks – Create an Advanced Physics Demonstration.***

**Naming Convention**

* Yourname\_PfG\_Unity\_SourceFiles.zip
* Yourname\_PfG\_Unity\_ReleaseBuild.zip

**Declaration**

By submitting this work under my name, I declare that my submission is my own work with respect to plagiarism and does not violate any copyright laws. I have retained a copy of this assessment material that I can produce if requested.

Tick to acknowledge you have read and agree with this declaration.

Name: Connor Mills Date: 08/03/2023

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**Work Submitted:***Tick to acknowledge you have submitted this part of the assessment*

1. Advanced Physics Simulation:   
   I have created a Wipeout inspired obstacle course. The player is challenged to navigate a series of obstacles and complete the course in as short of a time as possible.  
   * Physics Joints:   
     There are four different joints in my game:  
     - A configurable joint for each of the moving platforms.  
     - A hinge joint for each of the swinging hammers.  
     - A hinge joint for each spinning top.  
     - A configurable joint for the elevator.
   * Ragdoll Physics:   
     Whenever the player is hit by one of the hazards, the swinging hammer or spinning top, the player is thrown away and ragdolled.
   * Raycast into simulation's scene for picking purposes:   
     There are several buttons that you can click on that do different things. Such as move the elevator up and down or start the timer. You can also click on the pedestal that the ball starts on to respawn it. The final interaction that is possible is that you can click on the ball itself and apply a force to move it.
   * Trigger systems with callback functions that impact the simulation in a meaningful way:   
     - Each hazard has a on collision detection trigger that ragdolls and applies a force to the player.  
     - A trigger zone is present under neath the course that ragdolls the player if they fall into it.  
     - There is also a trigger zone at the end of the course that detects if the ball falls into the hole that stops the timer and displays the winners time.
   * Use of Character Controller physics bodies supporting dynamic and kinematic rigid bodies:   
     The player can interact with kinematic and dynamic rigid bodies. The player can interact with the ball, which is a dynamic rigid body, by pushing it.

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