

COMP222 - 2018 - First CA Assignment  
Individual coursework  
Arkanoid-like Game

## Assessment Information

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|---|---|
| Assignment Number   | 1 (of 2)  |
| Weighting   | 10%   |
| Assignment Circulated   | Tuesday 20 February 2018  |
| Deadline  | Wednesday March 21 2018, 15:00  |
| Submission Mode   | Electronic  |
| Learning outcome assessed                                     | 2. An appreciation of the fundamental concepts associated with game development: game physics, game artificial intelligence, content generation;<br>3. The ability to implement a simple game using an existing game engine |
| Purpose of assessment   | To implement a simple 3D game using the jMonkeyEngine library   |
| Marking criteria  | The marking scheme can be found in Section 3  |
| Submission necessary in order to satisfy Module requirements? | No  |
| Late Submission Penalty                                       | Standard UoL Policy.  |

**I enforce a “no error policy” in this module: If your code does not compile, your mark will be capped at 40%. Thus, you may get a higher mark for an incomplete solution than for an advanced sketch.**

If you want to show me your attempt to add some features that does not compile TOGETHER with your working code, please feel free to submit **two** ZIP files clearly indicating which one of them contains working code and which contains an incomplete one. In this case, you will not be penalised and you can get a higher mark.

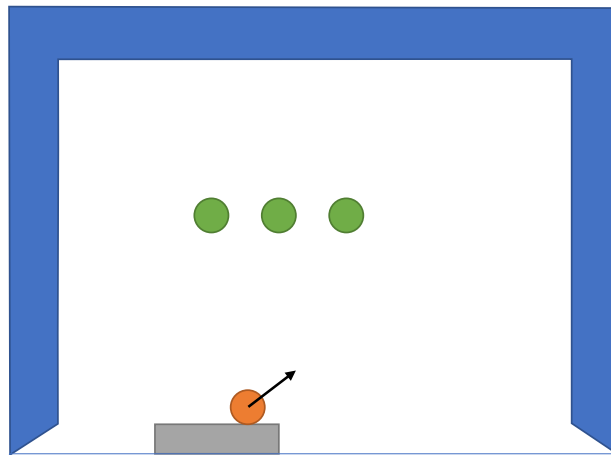
# 1 Objectives

This assignment requires you to implement a simple 3D game using the **jMonkeyEngine 3.0** library.

## 2 Game Description

The objective of this assignment is to implement a game inspired by the classic arcade game Arkanoid, see, for example, <https://en.wikipedia.org/wiki/Arkanoid> and <https://youtu.be/--pBWsS867s>. The game is played on a rectangular field with solid top and sides and an open bottom. In the middle of the field, game objects are positioned. A player controls a moving paddle at the bottom of the field, which prevents the game ball from falling from the field. The game ball bounces off the paddle, the boundaries and the game objects on the field. When the game ball strikes a game object on the field, the object is removed. When all objects are gone, the player wins the round.

In the classic game, the game objects are rectangular. In this assignment, we will use balls as obstacles.



## 3 Marking Scheme

The assignment is split in a number of steps. Every step gives you some marks. You do not have to implement them in any particular order.

### Step 1: Modelling the environment 20%

Model the playing field, the paddle, the green balls and the red game ball. You can either use a 3D modelling tool like Blender or use jMonkeyEngine shapes. You must put at least three stationary green balls on the field, and have a red game ball.

Up to 10% will be given for a simple bare construction. Further points will be awarded for using shades, textures and creative lighting.

## **Step 2: Physics 35% total**

The purpose of this step is to model the physical interaction of entities. The step is further divided into smaller sub-steps.

### **Step 2.1: Ball motion 5%**

Model the movement of a single ball on the playing field. The ball should start moving either from somewhere near the bottom centre of the field or from the top of the paddle and can move in any direction within the field and does not have to bounce off.

### **Step 2.2: Collision with the boundary and the paddle 10%**

Model how a ball bounces off the top and sides of the playing field and off the paddle.

### **Step 2.3: Collision with the green balls 10%**

Model the red ball collision with the stationary green balls on the field so that when the red game ball hits one of the stationary green balls on the, it bounces off realistically.

### **Step 2.4: Removal of physics entities 10%**

Ensure that green balls are removed from the field *after* the red ball bounces off. Ensure that when the red ball gets off the field it is removed from the game, respawned, and starts moving again.

## **Step 3: Keyboard (and/or mouse) interaction 10%**

Introduce a way to move the paddle left and right.

## **Step 4: Gameplay 15%**

Add a visible points count (every hit of a green ball by the red ball brings 1 point) and some kind of game levels. The player progresses to the next level when the field is cleared. To get full marks for this steps, you should have at least two levels and it should be clear when the player progresses to the higher level.

## Extra 20%

You can see that marks for the steps described add up to 80%. In order to get 20% extra you need to be creative and implement some nice feature. Some ideas: textures, sound effects, green balls forming interesting shapes, power-ups, shades of green balls which are removed after multiple hits, more realistic physics, more interesting physics (you may avoid angles too close to the horizontal line), obstacles on the field, levels of difficulty, some form of AI,...

## 4 Deadlines and How to Submit

- Deadline for submitting the first assignment is Wednesday, 21 March at 3pm.
- Submission is via the departmental submission system accessible (from within the department) from <http://intranet.csc.liv.ac.uk/teaching/modules/module.php?code=COMP222>. Please export your project (File → Export Project → To ZIP) and submit the ZIP file.

If you add any extra features to get the extra 20%, please submit a document describing what you've done.

If you want to show me your attempt to add some features that does not compile TOGETHER with your working code, please feel free to submit **two** ZIP files clearly indicating which one of them contains working code and which contains an incomplete one. In this case, you will not be penalised and you can get a higher mark.