Physics Interaction with Objects

DEGREE: Games Development
UC: Programming Fundamentals and Maths and Physics for Games I
YEAR/SEMESTER: 2023-2024 / 1st

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BRIEFING

01. PROJECT DESCRIPTION

The **Mini** Project consists of a small-scale simulation with **side-view** perspective. The main goal is to apply the knowledge taught in the curricular units of Math, Physics and Games I and Programming Fundamentals. Therefore, a full functional game is not required (gameplay rules, scores, power-ups, storytelling are optional).

This document details the project briefing.

02. PROJECT REQUIREMENTS

- The project must be developed individually;
- The project must be 2D platformer with **side-view** perspective;
- The game must include the following elements:
    - One player controlled character;
    - **Static objects** (static platforms that are not affected by external forces);
    - **Dynamic objects** (that can be moved by external forces);
    - **Explosive artefacts** that can placed by the player;
        - The explosion is modelled as a circle with a central position and **radius** in world space;
        - The explosion produces an effect that expands outward rapidly in **all directions**;
        - Dynamic objects that are within the radius of the explosion **are affected by the explosion force** and mut react to the explosion (being launched in the opposite direction of the explosion);
        - Anything outside the circle is not affected by the explosion;
        - The force of the explosion decreases in proportion to distance from the centre of explosion (i.e., objects that are close to the origin of the explosion must receive a stronger force than those that are more distant from the centre);
- The project must be developed in the Lua programming language using the Love2D game engine;
- No external programming libraries are allowed;
- The game world can fit a single game window (scrolling is optional);

03. TOOLS & MATERIALS

- Visual Studio Code (https://code.visualstudio.com/)
- Löve 2D (https://love2d.org/)

04. DELIVERABLES & GRADES

- **Delivery**
    - **1st delivery, submission on Canvas: 05**/11/2023 at 23:59
    - **2nd delivery, submission on Canvas:** 08/12/2023 at 23:59
    - **Deliverables:**
        - Zip file with the source code.
        - Video of the games
    - **Presentation Date:** 11/12/2023 at 11:00
    - **Grade:**
        - Implementation of the simulation: 20% (first delivery)

- Implementation of the simulation: 40% (second delivery)
- Oral discussion during the presentation: 40%

05. EVALUATION CRITERIA

- The evaluation is entirely based on the correct application of math, physics, and programming concepts.
- The design and visual aspects are not part of the evaluation criteria;