Programming Project #5
CpSc 4160/6160: Data-Driven 2D Game Development
Computer Science Department
Clemson University
Object Pooling, Explosions, and Projectiles
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Due Date:

To receive credit for this assignment your solution must be submitted, using `handin`, by 8 AM, Monday, April 22nd, 2019. You may receive 90% of the grade if you submit within three days of the deadline.

Project Specifications:

The goal of this project is to incorporate more action and interaction into your animation so that it includes projectiles, explosions, and an object pool. Your goal should be to develop a consistent theme because in the next project your game must reach a reasonable conclusion.

Sprites: For this project, you are not required to draw your own sprites, but you **may not** use any sprites that I have provided. If you use sprites from the internet you must cite the source in your **ASCII** README.

Data-Driven: your game must be data driven so that you read game constants from an XML file.

Story Driven: The requirements listed below should guide this project; however, if one or more of the requirements is inconsistent with the theme or story that you are trying to tell, send me an email, stop by during office hours or send an email with times that we might meet to discuss your game idea and to negotiate a trade for the inconsistent requirement.

Sound and Music: Your game should include background music and at least one sound effect.

Object Pool: An important goal of this course is to provide an opportunity for you to use seven design patterns. The *object pool pattern* is one such pattern. Therefore, you should incorporate an object pool into your game and, for this project, your HUD should show that the pool is working. Figure 1 illustrates, in the upper right corner, the instructor's use of an object pool for bullets, with **3** bullets active and **2** bullets in the pool. This figure is intended only for illustration and should not be interpreted to mean that you must have bullets and they must be pooled in your game, or that you have to have a separate HUD that must appear in the upper right corner. The point is that you should implement an object pool and demonstrate that the pool is working in a HUD.

- Submit a compressed project directory that contains your project files, assets, video, and README
- Submit an appropriate length mp4 movie that illustrates your object pool and game features.
- Include a well-controlled player object, and an animation that creates the illusion of depth.
- An information HUD, toggled with F1, that informs the user about how to play your game, including how to move the player, how to shoot, jump, run, ... The HUD can include any game information you wish to display but a player other than you must be able to play your game.
- Projectiles: you don't have to shoot bullets, but you need projectiles.
- Collision detection that triggers explosions or some substitute.
- Your player should explode and, after the explosion completes, should re-appear. Use OO design.

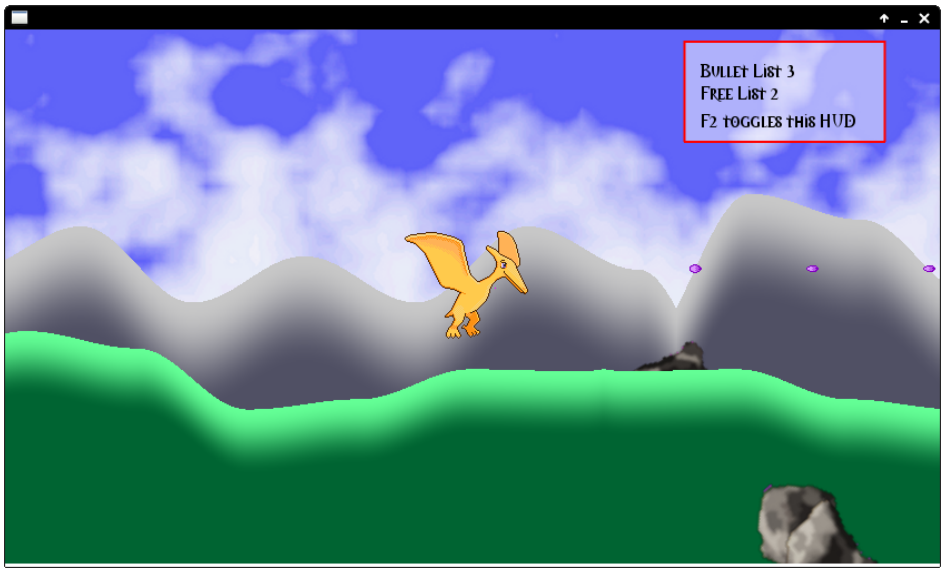

Figure 1: An illustration of object pooling, with three active bullets and one bullet in the "pool"

- NPC explosions: use chunks and/or frames.
- Demonstrate object pooling and show pool contents in a HUD.

Your assignment will be tested on a Linux platform using gcc, with Meyer's flags on, however you should test your project on several different platforms and it should be independent of platform and language implementation.