# Final Project: Improve the Game

## Objectives

* Learn to take an existing code base of object-oriented code and improve upon it with your own changes.

## Instructions

Our game takes place in a world in which a gunslinging hero has to take out zombies (or other monsters). Since this assignment gives you a little bit of freedom to be original, I've got a few ground rules for images which you find or create:

* Keep all of the enemies non-human. Cartoon monsters and zombies work great and get the point across.
* Don't depict any gore.
* Keep it clean. In other words, don't create anything that would embarrass or demean your fellow students or instructors.

In this assignment, you will be extending and improving the game which we've worked on for the last few weeks in class. This will require that you create images or find usable images on the internet (like I did). You must use a public domain image or an image which you own the rights to use (because you created it or a friend created it). This makes things slightly harder, but it does help keep the project legal with regards to copy write owners. All images should be square images images, and you are encouraged to use a transparency layer so that a background image can be seen through a layer. If you are familiar with image editing software, free tools such as Paint.net and The GIMP allow you to edit images with transparency layers. Microsoft Paint does not have support for transparency layers.

You'll need the following.

* A new sprite for a weapon projectile. I encourage you to make your own.
* An icon to find on the map to represent your new weapon projectile.
* An image for a new enemy. Make sure that you get a walking version and a dead version.

You may start with the version that you made in class or you can begin with the version that I've already uploaded to the course website.

## Part 1 (70 percent of your grade)

You'll need to make a few corrections to bad code that was presented in class. Someone suggested that we separate out the Hero class into two classes: A Hero class and an ProjectileManager class. I think this is a great idea and you'll need to do this. Create a calls called ProjectileManager that supports all of the operations of a list of Projectiles. This includes the following:

* A constructor to create a new, empty list of projectiles.
* A method to update all projectiles.
* A method to add a new projectile to the projectile object. It's recommended that the parameter to this method be of type "Projectile".
* A method to check for collisions between all enemies.

Mind you, you shouldn't have to write any new code for this part since everything is already written for you in the Hero class. You need to divide the responsibilities. The Hero class will still need to "Shoot" a new Projectile object.

## Part 2 (20 percent of your grade)

Introduce a new Enemy. Give it a look and give it 2 hit points to take down instead of 1. You'll also need to update the EnemyManager to specify how often this enemy is seen on the screen. Right now, a new enemy generates every 80 or so frames when a 0 is randomly rolled. What you might do is double enemy spawn rate to to 160 (make it a static final in your code) and then have the ZombieLad spawn on 0 and your new enemy spawn on 1. That way enemies won't fill the screen too quickly.

## Part 3 (10 percent of your grade)

* Create a new attack for the Hero. You'll have to modify your Projectile class to specify damage dealt instead of the default "1".
* This new attack will require you to extend the Projectile class.
* This new attack will deal 2 damage instead of 1.
* Create a powerup icon that the player must find somewhere in the game world in order to shoot with this attack.
* When the Hero reaches the powerup, a flag will need to be set inside the Hero class to shoot the new Projectile that deals higher damage instead of the standard 1 damage projectile.
* Inside the "Shoot" method, if the powerup flag has not been set, fire the old projectile object. If it has been set, fire the new projectile object.

## Optional Suggestions

* Modify the map so that you can control where the powerup will be in every game. Don't make it visible on the start screen. Let the player find the powerup.
* You may also randomly spawn the powerup somewhere on the map, but this might prove difficult.

## What to turn in.

Zip up your entire project folder and turn it in.