Lab 7: C++ in Unreal

Due Monday, 12/2
Tutorial this lab is based on: https://www.youtube.com/watch?v=D4UM73O7Zxs
To get checked off you'll need a scene with

> Shrinking cubes when you hit them
> At least one more type of object to hit in the game
> A particle effect
> A new material applied somewhere

Setup

1. Download the project at this link: https://github.com/tomlooman/SimpleFPSTemplate
2. You can go ahead and open the unreal game project file in the folder to open the template.
3. You'll also want to open the files under Source/FPSGame/Private in an editor. He uses visual studio in the tutorial, but since I have a mac I just open them in a simple editor.
    a. Take a look at FPSProjectile.cpp. The OnHit function is called when a component gets hit. This will be the main function we edit in this lab.
    b. In this lab we are going to make a first person shooter where when we shoot a cube it shrinks a bit in size, and if we shrink them enough, they disappear.

Shrink Cube

1. In the OnHit function the parameters are
    a. HitComp - the component that was hit, which could be ourselves or a cube that we need to shrink.
    b. OtherActor - thing that hit us
    c. OtherComp - is the component of the other actor (like a mesh)
    d. NormalImpulse - direction of the hit
    e. Hit - more information about where it was hit, etc
2. Now we are going to write some code in the function to make the boxes shrink when we hit them and ultimately disappear.
    a. After the line that calls an "`AddImpulseAtLocation()`" function write
    ```
    FVector scale = OtherComp->GetComponentScale();
    scale *= 0.8f; //whatever shrink fraction you want
    if (scale.GetMin() < 0.5f) {
        OtherActor->Destroy();
    } else {
        OtherComp->SetWorldScale3D(scale);
    }
    ```

3. Save the cpp file, and open the project. Make sure to compile the project so it compiles the c++ code. (Not just Build, find the compile option on the menu)
4. If you play the first person shooter game you should be able to hit the blocks and they shrink. If you can't, there may be an error in your syntax. Make sure all the methods are capitalized & double check the syntax. Make sure you've saved the c++ and compiled the project on Unreal.

Add Your Own Spin

1. Now it's time to add your own spin to the scene.
   a. Add different objects to make the scene cooler. (At least one other type of object besides a cube to hit)
   b. Add a particle effect to the scene (You can enable Niagara if you want or try and use the default particle system)
      i. personalize it enough so it isn't just the default type (don't just drag in the default fountain, add something to it!)
   c. Add a personalized material of some kind to object(s) in the scene
   d. Be creative!

Once you have the cubes shrinking when you hit them, another type of object in the scene, a particle effect, and a new material, you are ready to be checked off!