CS174: Final Project
"Roll-a-Ball" plus

Assignment Name: FinalProject
Turnin Filename: <last>_FinalProject

Your final project will be based on the Unity sample game, "Roll a ball." Steps detailing the construction of Roll a Ball can be found here on the Unity web site:
https://learn.unity.com/project/roll-a-ball-tutorial
You should go through the entire tutorial, and not skip any steps. Much of what is covered will be review, but there are handful of new concepts it's important not to miss.

Unity Roll a Ball covers many of the concepts we have covered during class including object creation, the Update() method, OnCollision() method, displaying text, as well as general C# scripting.
However Roll a Ball is uninteresting in two main ways:
1) It has no audio
2) It isn't much of a game

In the Roll a Ball sample app, you create a basic playfield, a player (sphere) and several collection objects. The purpose of rollaball is to navigate the sphere into the collection objects. When you have collected them all, the game is over.

Using your knowledge of C# and Unity audio (as well as your AudioSourceEx and helper classes), and your knowledge of good game audio design, you will make Roll a Ball more fun by adding some actual gameplay, BGM and SFX.

Code Organization and Style (20 points)

• Implement a State Machine for the main states of the game
  ○ Menu, Playing, Win, Lose
• Implement GamePlay loop:
  ○ Menu -> start game-> win/lose->Menu
• Only read input in the "GameController" object
• Code comments are especially important if you are making your own game. Be sure to comment functions, and overall program flow.
• Create functions as appropriate. If you find that a function or a section of code is getting long, or if you are doing the same tasks in multiple places in your code, that's a good hint that you should make it into a separate function.
• Function names and variables should help a reader understand what they are do and what they are used for.
• Code style (indentation, bracket placement, etc) should be consistent
	20 points

Minimum Enhancements: Audio (25 points)

SFX for game elements. Ball collisions with objects and walls should make appropriate sound effects. Sound effects should be appropriately 3D positioned. Hint: Use your AudioSourceEx class to add more advanced audio features than just playing a wave file for full credit. Add a subtle 'motion' sound for when the player ball is in motion. The ball rolling sound should have 2 layers, one for rolling slowly and one as it rolls faster, with a smooth transition. Dialogue: Add at least one meaningful line of recorded dialogue. During dialogue playback, BGM should be ducked appropriately.	10 points
Add background music to the game There should be at least 3 pieces of music representing at least 3 game states. The music should crossfade smoothly. **BAMSD**: You may use music from previous DigiPen coursework/projects **BAGD**: the library has access to music libraries.	10 points

Implement a “pause” menu. ‘Escape” toggles pause mode. During pause the pause menu, background music should be attenuated and filtered. Timers should stop counting.	5 points

Default Gameplay Enhancement: (40 points)

“Find the Treasure”

You have 60 seconds to find the hidden treasure, which is hidden inside one of the objects. The time left is displayed as a ‘countdown’ clock in the upper left corner.	5 points
The ‘treasure’ object is picked at random by the computer.	5 points
By moving the ball around, you ‘pick up’ the objects, until you find the treasure. However, in addition to the treasure, one object is a bomb, also picked at random by the computer.	5 points
The bomb is indistinguishable from the other objects except for a very quiet ticking sound when you are very close to it.	10 points
If you ‘collect’ the bomb, or time runs out, the game is over and you lose. If you collect the treasure, you win. As with any game, finding treasure or blowing oneself up should have appropriate sound effects and player messaging	10
“Click on Object” Mechanic You must come up with at least one game mechanic that involves the player clicking on an object.	5 points
Additional Discretionary Points for creativity in gameplay and/or sound design. Note: If you are creating your own game far removed from “Find the Roll-a-Ball Treasure,” you don’t necessarily need every feature listed under “Default Gameplay Enhancement.” Create your own rules best matched for your game. However, your game should have at least a minimum number of mechanics including at least: Time limit Scoring/health Object Tags Win/Lose condition Display Status with on-screen text Other possible mechanics might include: AI/Navmeshes	15 points

Color of objects as mechanic Audio as a gameplay mechanic Textures, visual flourishes (particles, etc.) You should also ensure that the Audio portions of the game at least meet those listed in "Minimum Enhancements: Audio" above. IMPORTANT: If you are doing a game significantly different from roll-a-ball, do NOT create games that use 3D models or animations.	

Rulesheet (-10 points if missing)

You must include a **pdf** file in your game's directory called "Rulesheet.pdf." This should be an explanation the goals and 'how to play' rules for your game. Include objectives, player input.

The rulesheet should also contain at least one paragraph describing the audio implementation you have created, so that we know what to listen for. For example, it might say:

> *There are 2 pieces of background music. When there are 10 seconds left to play in the game, a crossfade transition is made to the "10 seconds left music." Each object 'pickup' sound is played as musical notes, sequentially using the AudioSourceEx 'Sequential' function.*

Grading

A full implementation of the Audio enhancements and Default Gameplay enhancement specifically listed above ("Find the Treasure" + creative), with full credit for comments and function names **will receive a 'base score' of 85**.

There will be 'checkpoints' to verify that progress is being made. These checkpoints will be graded as normal assignments.

If you like, replace the Default Gameplay Enhancement with your own game design. Up to 15 discretionary points will be given based on creativity and implementation of that creativity in adding rules and sounds, VO, etc to "Roll a Ball."

BE CREATIVE: this is your big shot at playing 'game designer'. Think about different potential rules, presentations, etc. But one warning: don't think up something so complex that you have trouble implementing it. That said, given your current knowledge of programming, Unity and C#, you should be capable of doing quite interesting things!

You may use visual assets from the Unity Asset Store.

YOU MAY NOT USE ANY CODE FROM 3RD PARTY source other than the initial 'roll-a-ball' tutorial. DOING SO WILL BE CONSIDERED AN ACADEMIC INTEGRITY VIOLATION AND WILL RESULT IN A SCORE OF 0.

You must include a playable executable, which can be played stand-alone, outside the editor.
NOTE: You must still submit your entire unity project directory.

Rubric

- "Warning" messages are 5% penalty
- Missing Rulesheet is 10% penalty
- Appropriately commented: 10%
- Appropriate function, variable names, indentation, readable: 10%
- No late assignments will be accepted
- It is your responsibility to test your program to make sure it functions properly.

NO LATE FINAL PROJECTS WILL BE ACCEPTED