Space Invaders With Physics

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Our plan for our project is to take the game Space Invaders and add realistic physics to many of the game's elements. These physics simulations include.

Enemies falling when destroyed
In the original Space Invaders game, enemies would simply disappear when destroyed. We plan to add physics to the enemies so that they fall and explode when they are destroyed. This would involve repurposing code from the 2D Square Falling from the Sky in the class example.

Barriers rotating
In the original Space Invaders game barriers would be destroyed as they were shot by the player and enemies. Our plan for barriers in our version of this game is to apply rigid body dynamics to our barriers so that instead of being destroyed, they can be pushed and rotated out of the way by enemy and player projectiles. This will involve repurposing the code from our rigid body simulation lab and modifying it so rotation can be applied depending on where the shot lands on the barrier. The rotation of the barrier will change how effective the barrier is at blocking enemy fire.

Physics applied to player's projectiles
In the original Space Invaders game, projectiles simply fly straight up. Our plan is to add physics to these projectiles by using projectile motion equations. This would allow players to angle their shots as opposed to only being able to shoot straight up. This would allow for more precise aiming as well as being able to apply force to the rigid body barriers from many different angles to rotate it in whatever direction the player wants.

Collision Detection
Being able to detect collisions between many different elements of the game will be important to our simulation. This includes detection between the player's projectiles, enemies, and barriers, as well as detecting when the player has been hit by a falling enemy or enemy attack. We will also need to be able to detect collision between projectiles and the rigid body barriers, this collision will need to be detected based on how the barriers are rotated. This could be done using a combination of the trap code from our random walk class example and our collision detection lab.

Expected Outcome
Our ideal outcome is to create a more advanced and complex version of Space Invaders. Applying these advanced game physics will create a fresh and interesting take on the 1978 classic. This will also provide us with a challenge that will allow us to demonstrate what we have learned. This idea of improving a game gives us a lot of flexibility when it comes to the project. If we take on too much, it'll be easy to drop some features, and if we take on too little, new features will be easy to take on.