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CIS 568

Space Invader Features

**Base Game Features**

* Title Screen: Allows player to exit and click new game.
* Game Screen: Starts game with 5 rows of 11 space invaders and 4 shields.
* Loss state: Displays game over when player loses all lives, or the invaders reached ground level and redirects to title screen.
* Player Movement: Player laser base can only move horizontally and is bounded by the screen.
* Lasers: Players can fire missiles that will destroy shields, invaders, and mystery ships and has sound.
* Score: Game displays player score from killing invaders and mystery ships.
* Lives: Game displays number of lives player has left.
* Player death: Player laser base getting hit by missiles causes player to disappear, explosion sound to play, invaders to pause for 5 seconds, lives to decrement, and player to respawn in 4 seconds.
* Invader Movement: Invaders move in a serpentine pattern and descend and reverse direction once they reach the end of the screen.
* Invader speed: Modifies invader speed depending on number of invaders alive using logarithmic decay with a timer.
* Invader Waves: Destroying all invaders will spawn another wave of invaders following a cyclic pattern, where rounds further in the pattern have invaders spawn closer to the ground.
* Missiles: Invaders randomly fire missiles that can destroy shields and laser bases.
* Mystery ship: Spawns every 20 to 30 seconds.
* Shields: Have health and are destroyed on contact with invaders.
* Textures: Applied textures to invaders, laser base, missiles, lasers, shields, and mystery ships.

**Enhanced Game Features**

* Staggered Invader Movement: Invaders now move in a more natural fashion with invaders in lower rows moving and descending earlier by adding a move timer delay between each row of invaders.
* Shield Damage Indication: Shields no longer have health and are instead made of multiple components so that shield damage is more clearly indicated by the loss of its components.
* High Score: Game now stores high score which is persistent across multiple plays and exits
* Round: Game now displays round number
* Rigid body Physics: Collisions do not always result in both objects being destroyed and will now be affected by collision physics
* Object accumulation: Lasers and bullets accumulate on the ground after being fired while Invaders and mystery ships fall to the ground after being hit
* Laser Ricochet: Lasers can ricochet after collision to destroy more enemies.
* Debris: Objects that accumulate on the ground will slow down the player (Speed of laser base will decrease exponentially with the number of objects it is colliding with) but the player can clear them away by pushing them off the screen.
* Particle Systems: Player death and invader death will result in explosion and fire particle systems, respectively.
* Power up Resource: Instead of refreshing lives every round, players can collect power ups to gain another life up to a maximum of 3. They will spawn occasionally on the platform and will play a sound effect when the player collects them. Only 1 power up can spawn at a time.
* Kill Streak Goal: Players must kill invaders in quick succession to go on a kill streak and increase the number of lasers they can fire at once. The killstreak is displayed on the top right corner along with a bar that indicates the amount of time before the killstreak decrements by 1.
* Alien Boss: When all invaders in the round are destroyed, an alien boss spawns with health proportional to the round number. Alien bosses shoot nukes that kill not only on impact but also within an explosion radius. When an alien boss spawns, a health bar will also appear so players will know how close they are to destroying it. While the player is fighting the alien boss, the killstreak timer will be frozen so that players can make use of the killstreak that they have earned.