SUN DEFENDER

GOAL

The player must stop enemies from destroying the sun!

FEATURES AND MECHANICS

Setting

Set in a retro-futuristic world

- There is a sun rising from a mountain range, and a plateau at the foot of the mountains.
- The player's base and canons are on the plateau, on opposite side from the mountains.

Sun

- The sun is made of segments.
- If all segments of the sun are destroyed, the game is over.

Mountains

- Mountain range has several peaks and valleys.

Enemies

- Enemies appear on, and move between, mountain peaks/valleys. (position)
- Enemies are visualised with a coloured light. (colour)
- The enemy colour indicates their health. (Health)
- Normal enemies can be killed with one shot. Some enemies take multiple shots to die. (start health)
- Enemies shoot at the sun (from mountain peaks), sometime after they are spawned. (shooting)
- Enemies cannot shoot the sun from a protected peak (a peak that the player can't shoot at).
- An enemy can destroy a segment of the sun by shooting it continuously for a specified time.
- After destroying a sun segment, the enemy will continue moving and/or attempt to destroy another segment until it is killed or the game is over.
- Enemies appear in waves. (numEnemies)

- Maximum number of enemies displayed at any moment is less than the number of peaks/valleys. (to maintain sense of animation). (numMountainPositions)
- If all enemies in a wave are destroyed by the player, the level-up mode is loaded.
- Enemies die in a fantastic explosion.

Player (Canons)
- Player can shoot enemies using their laser canons.
- Player has several laser canons.
- Laser canon buttons illuminate with a colour to indicate charge status.
    - blinking = charging
    - solid = ready to fire
- Each canon is paired with a mountain peak; a canon can only fire at its paired mountain peak.
- There may be more mountain peaks than canons.

Projectile (player's)
- Each projectile is visualised as a coloured light. (colour)
- Laser canon projectiles take time to reach the mountain peak. (speed)
- If projectile reaches peak when enemy is on the same peak, the enemy is destroyed.
- Player's canons take time to recharge. (rechargeTime)
- Only one projectile can be in the air at any time. (inflight)

HUD
Main LCD/OLED display
- Score
- HiScore
- Level

Aux LCD/OLED display
- Instructions
- LevelUp choices

Canon button lights indicate canon charge status
- blinking = charging
- solid colour = ready to fire

Engine
States
- GameOver
- LevelUp
    - Between levels, Players can trade their points for powerups. Powerups include
        - - faster canon recharge
        - - increase projectile speed

- - fire 2 canons at once
- - fire 3 canons at once
- - fire all canons at once

  - After player makes their choice in level-up mode, the next level is loaded.
  - The number of enemies in the wave is incremented with each new level.
- Playing
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Core functions
- Run()
- Input()
- Update()
- Render()