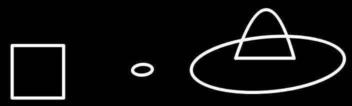
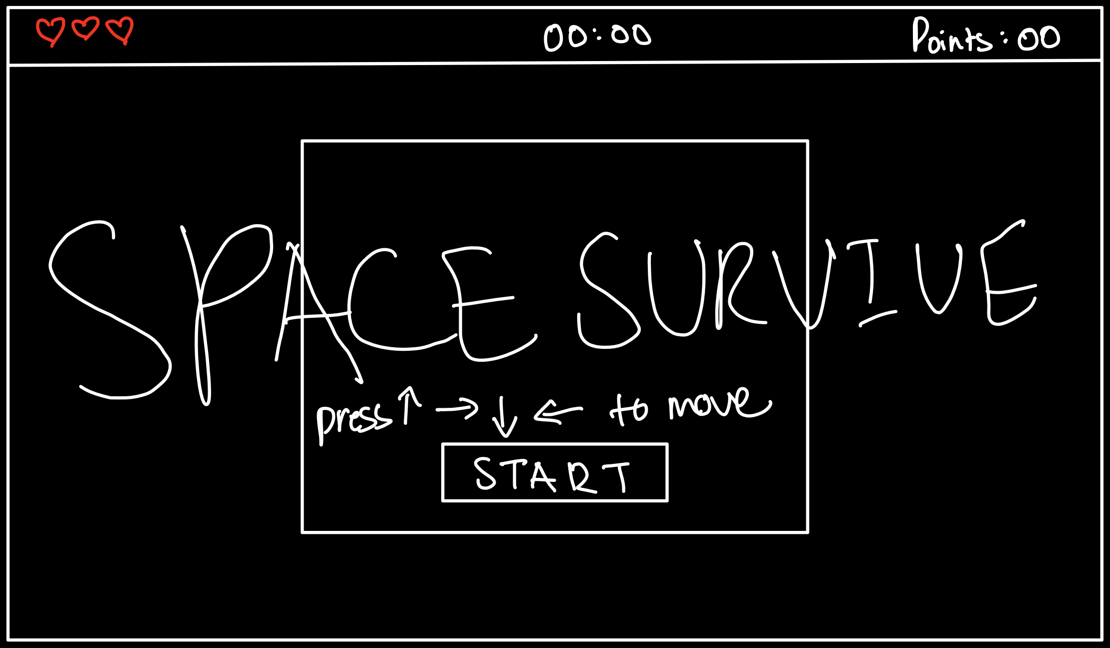
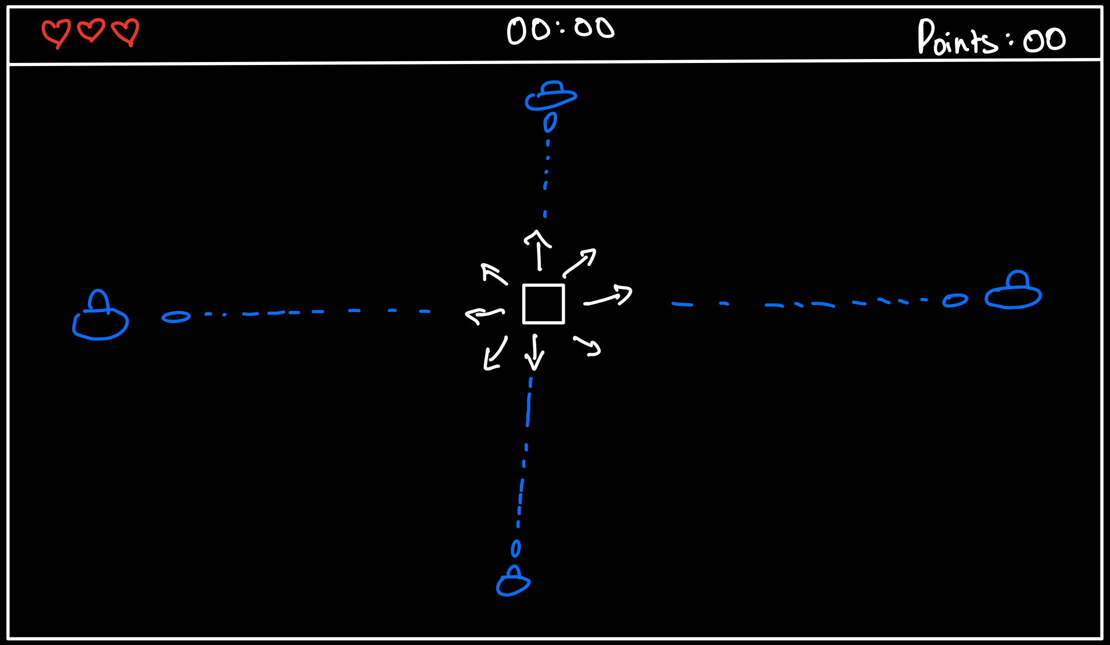
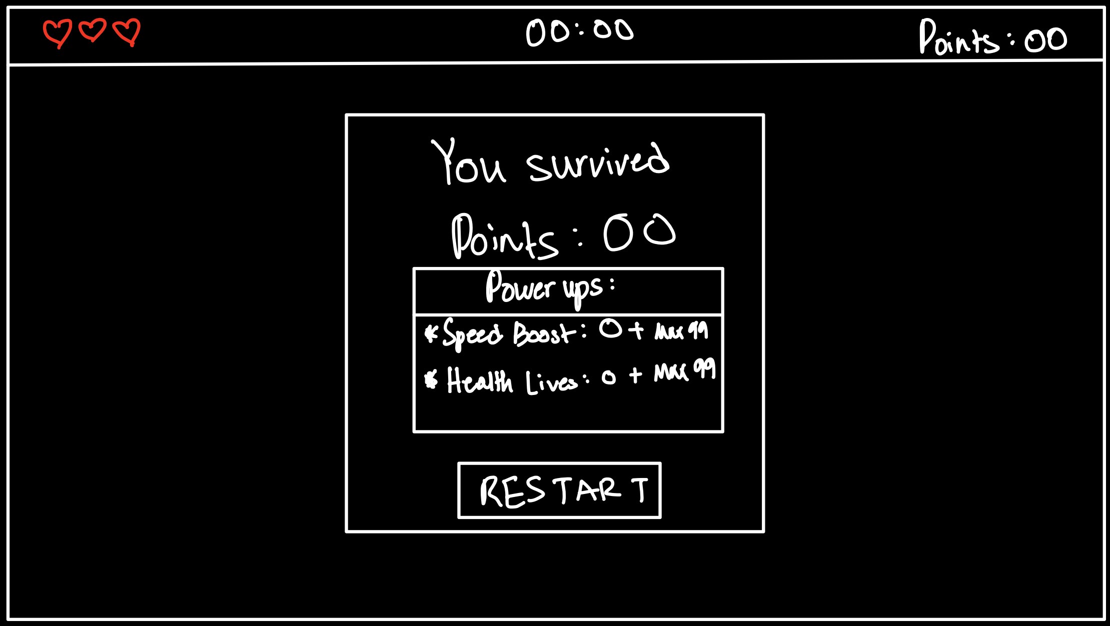
Space Dodge




♡♡♡
00:00
Points : 00
SPACE SURVIVE
press ↑ → ↓ ← to move
START


♡♡♡
00:00
Points : 00


♡♡♡
00:00
Points : 00
You survived
Points : 00
Power ups :
* Speed Boost : 0 + Max 99
* Health Lives : 0 + Max 99
RESTART

User stories:

1. **Game Start:** As a player, I navigate to the game interface and click the "Start Game" button to begin playing.
2. **Character Movement:** As a player, I use the arrow keys to move the rectangular spaceship around the grid, avoiding enemy laser bullets.
3. **Enemy Spawning:** As a player, I notice enemy spaceships spawn at random locations on the grid every 5 seconds, requiring me to adjust my movement strategy.
4. **Laser Shooting:** As a player, I see enemy spaceships shoot laser bullets toward my position at regular intervals, making it crucial for me to stay alert and dodge the incoming shots.
5. **Survival Time Tracking:** As a player, I keep an eye on the timer displaying how long I have survived, knowing that I will earn points based on my survival time.
6. **Point System:** As a player, I receive 1 point for every 30 seconds of survival, which is reflected in the score displayed at the top of the screen.
7. **Health Management:** As a player, I start with 1 health point, which decreases when I get hit by enemy laser bullets.
8. **Game Over Experience:** As a player, when I lose all my health, I see a game-over screen displaying my total score and the option to restart or exit the game.
9. **Upgrades After Game Over:** As a player, after the game ends, I have the option to upgrade my speed or health (lives) using the points I earned during the game, with a maximum of 99 upgrades for each category.
10. **Game UI Display:** As a player, I see my total score, the survival time, and the number of lives prominently displayed at the top of the page throughout the game, allowing me to track my progress easily.

Pseudocode Plan

```
// Define constants and variables
// Define a constant for the player's rectangle size
// Define constants for the grid dimensions
// Define a constant for the enemy spawn rate (5 seconds)
// Define a constant for the laser bullet speed

// Define the app's state variables, but don't assign values to them
let player;                  // Variable for the player's rectangle object
let enemies;                 // Array to hold enemy spaceship objects
let bullets;                 // Array to hold bullet objects
let score;                   // Variable to keep track of the player's score
let lives;                   // Variable to track player's lives
let timeSurvived;            // Variable to track the time survived
let gameOver;                // Variable to check if the game is over

// Select and save (cache) elements in variables that need to be accessed in the JavaScript
code more than once
const scoreDisplay = document.getElementById('score');      // Element to display the score
const livesDisplay = document.getElementById('lives');      // Element to display lives
const timeDisplay = document.getElementById('time');        // Element to display time
const gameCanvas = document.getElementById('gameCanvas');   // Element for the game area
const playAgainButton = document.getElementById('playAgain'); // Button to play again

// Add event listeners - use delegated event listeners to listen to multiple elements with a single
listener
document.addEventListener('keydown', handleKeyPress);        // Event listener for player
movement

// Invoke the init function used to initialize all state variables
function init() {
    player = createPlayer();          // Create the player object
    enemies = [];                     // Initialize the enemies array
    bullets = [];                     // Initialize the bullets array
    score = 0;                        // Initialize score
    lives = 1;                        // Set initial lives
    timeSurvived = 0;                 // Initialize time survived
    gameOver = false;                 // Reset game over status
    updateDisplays();                 // Update the displays with initial values
    startGameLoop();                  // Start the main game loop
}

// Invoke the primary render function that transfers all state variables to the DOM
function render() {
    clearCanvas();                    // Clear the game canvas
    drawPlayer(player);                // Draw the player on the canvas
    drawEnemies(enemies);              // Draw enemies on the canvas
    drawBullets(bullets);              // Draw bullets on the canvas
    updateDisplays();                  // Update the score, lives, and time displays
}

// Start the game loop
function startGameLoop() {
    setInterval(function() {
        if (!gameOver) {
            updateGame();              // Update game state (movement, collisions, etc.)
            render();                  // Render the game
        }
    }, 1000 / 60);                     // Run at ~60 FPS
}

// Update all state variables with the correct values depending on the user's choice
function updateGame() {
    movePlayer();                      // Move the player based on user input
    updateEnemies();                   // Update enemy positions and check shooting
    checkCollisions();                 // Check for collisions between player and bullets
    updateScoreAndTime();              // Update score and time survived
}

// Wait for the user to click on a button
function handleKeyPress(event) {
    if (gameOver) return;              // Ignore input if the game is over

    switch (event.key) {
        case 'ArrowUp':
            movePlayerUp();            // Move player up
            break;
        case 'ArrowDown':
            movePlayerDown();          // Move player down
            break;
        case 'ArrowLeft':
            movePlayerLeft();          // Move player left
            break;
        case 'ArrowRight':
            movePlayerRight();         // Move player right
            break;
    }
}

// Check for collisions
function checkCollisions() {
    // Check if the player has collided with any bullets
    for (let bullet of bullets) {
        if (isColliding(player, bullet)) {
            lives -= 1;                // Decrease lives
            if (lives <= 0) {
                gameOver = true;        // Set game over flag
            }
        }
    }
}

// Render the game message to the DOM
function updateDisplays() {
    scoreDisplay.innerText = `Score: ${score}`;
    livesDisplay.innerText = `Lives: ${lives}`;
    timeDisplay.innerText = `Time: ${timeSurvived}`;
}

// Wait for the user to click the "Play Again" button
playAgainButton.addEventListener('click', function() {
    init();                          // Reset the game state
});

// Invoke the init function to reset all state variables to their initial values
init();                              // Start the game when the page loads
```