

CODE EXERCISE

JAVASCRIPT CANVAS

Here are step-by-step instructions for creating a simple game using JavaScript and the canvas API:

1) Create an HTML file and add a canvas element to it. This will be the canvas on which the game will be drawn. Give the canvas an id so that it can be easily accessed with JavaScript.

```
<canvas id="game-canvas"></canvas>
```

2) In a separate JavaScript file, use the `getElementById` method to grab a reference to the canvas element and store it in a variable.

```
let canvas = document.getElementById("game-canvas");
```

3) Use the `getContext` method on the canvas variable to get a drawing context, which will be used to draw on the canvas.

```
let context = canvas.getContext("2d");
```

4) Create the game objects you need. You can create classes that will represent different elements in your game. For example, you can create a class for the player and a class for the enemies. These classes should have properties and methods that define their behavior in the game.

```
class Player {
  constructor(x, y) {
    this.x = x;
    this.y = y;
  }

  moveLeft() {
    this.x -= 5;
  }

  moveRight() {
    this.x += 5;
  }
}

class Enemy {
```

SUBMITTING EXERCISES

To earn certification all exercises must be submitted and accepted.

1) When you've completed all of the HTML exercises, please zip them into a single file and submit to our Dropbox at <http://bit.ly/CWDP2324>.

2) Next, fill out the certification completion form at <https://forms.gle/5EiUGCM6dGdIF2Py6>.

Remember, that all of your exercises for each module should be included in a separate zip file.

GETTING HELP

We always want to ensure that your questions are answered. There are a number of ways to get in touch.

1) We operate a lively Discord server. Join us at <https://discord.gg/tgxX2fCrv5> and you can ask your question on Discord. Mark and our team of instructional assistants monitor this Discord and answer questions ASAP.

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```
constructor(x, y) {
    this.x = x;
    this.y = y;
}

move() {
    this.x -= 2;
}
}
```

5) Complete the game using the code below. Examine how the canvas is used in the game itself.

```
<!-- index.html -->
<!DOCTYPE html>
<html>
  <head>
    <title>Simple Game</title>
  </head>
  <body>
    <canvas id="game-canvas"></canvas>
    <script src="game.js"></script>
  </body>
</html>
```

```
// game.js

// 1. grab a reference to the canvas
let canvas = document.getElementById("game-canvas");
let context = canvas.getContext("2d");

// 2. Set canvas dimensions
canvas.width = 800;
canvas.height = 600;

// 3. Create player and enemy objects
class Player {
  constructor(x, y) {
    this.x = x;
```

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```
this.y = y;
this.size = 20;
this.speed = 5;
}
moveLeft() {
  this.x -= this.speed;
}
moveRight() {
  this.x += this.speed;
}
moveUp() {
  this.y -= this.speed;
}
moveDown() {
  this.y += this.speed;
}
}

class Enemy {
  constructor(x, y) {
    this.x = x;
    this.y = y;
    this.size = 20;
    this.speed = 2;
  }
  move() {
    this.x -= this.speed;
  }
}

let player = new Player(canvas.width / 2, canvas.height - 50);
let enemies = [
  new Enemy(100, 50),
  new Enemy(200, 100),
  new Enemy(300, 150),
];

// 4. render the game state
function render() {
  context.clearRect(0, 0, canvas.width, canvas.height);
```

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```
// render player
context.fillStyle = "blue";
context.fillRect(player.x, player.y, player.size, player.size);

// render enemies
context.fillStyle = "red";
enemies.forEach((enemy) => {
  context.fillRect(enemy.x, enemy.y, enemy.size, enemy.size);
});
}

// 5. handle user input
document.onkeydown = function (event) {
  if (event.code === "ArrowLeft") {
    player.moveLeft();
  }
  if (event.code === "ArrowRight") {
    player.moveRight();
  }
  if (event.code === "ArrowUp") {
    player.moveUp();
  }
  if (event.code === "ArrowDown") {
    player.moveDown();
  }
};
```

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