CPSC 332 Web Development

Gonzaga University

Daniel Olivares

Homework 5 – Advanced JavaScript

Individual, non-collaborative assignment

Learner Objectives

At the conclusion of this programming assignment, participants should be able to:

- Demonstrate advanced JavaScript interactions in the browser
- Demonstrate JavaScript canvas interactions in the browser

Prerequisites

Before starting this programming assignment, participants should:

- Have completed chapter 6, 7, and 8 in the class zyBook
- Create a basic HTML web page using HTML, CSS, and JavaScript

Overview and Requirements

For this assignment, you will be creating a breakout game following a pre-existing tutorial using HTML, CSS, and JavaScript. You will then modify tutorial code to add additional features to the breakout game.

Submitting Assignments

Submitting your assignment requires submitting in two steps:

1. Submit your assignment to the appropriate GitHub Classroom repository. You'll find the invitation URL as part of this assignment.
2. Submit your GitHub Classroom repository URL to Canvas (Line 1).
3. *Submit your GitHub Pages URL to Canvas (Line 2)*

Note: *By submitting your code to be graded, you are stating that your submission does not violate the CPSC 332 Academic Integrity Policy outlined in the syllabus.*

Assignment Tasks (Part 1)

1. Your task is to implement the "Breakout" game from the tutorial and then build off the provided starter code for the remainder of the submission.
    a. Follow the step-by-step tutorial here: https://developer.mozilla.org/en-US/docs/Games/Tutorials/2D_Breakout_game_pure_JavaScript
    b. Accept the assignment (https://classroom.github.com/a/1OykmR03) and pull the starter code to your local repository as a starting point.
2. **You should start the remainder of the assignment from the provided starter code.**
    a. NOTE: if you push this project to your personal/public GitHub (or other) repository, make sure to cite the original source code (see the starter code README file).

Modified Breakout Game Requirements

1. Using the canvas (*Hint:* **see zyBook 8.8-8.9**):
    a. Create a start menu that includes (See Figure 1):
        i. Title text
        ii. A start game "button"
        iii. The start button should be styled using shadows
        iv. Start menu should be in a smaller background than the canvas
    b. Keep track of 'high scores' from multiple games (See Figures 2-6)
        i. Center the high score in the middle-top of the canvas
        ii. Score should accumulate for each game a player clicks "Continue Playing" (see below)
    c. Pause the game on a win/loss and change the output win/loss messages from a JavaScript alert to a message rendered on the canvas instead
2. In an HTML container below the canvas, create an options menu with a
    a. Pause game button
        i. Toggles the game pause/play state (Hint: see zyBook 8.9)
    b. Change speed slider
        i. Modifies the ball speed multiplier between 0.05 and 4 in 0.05 step increments with a default of 1
    c. New Game (Reset) button
        i. Clears the high score and score
        ii. Resets lives back to 3
        iii. Resets the board bricks
        iv. Resets the ball position
    d. Continue Playing button
        i. Clears the score
        ii. Accumulates the high score from the running total
        iii. Keeps lives at the current count
        iv. Resets the board bricks
        v. Resets the ball position
3. A Reload Window button
    a. Reloads the window. (The default action on win/loss condition in the starter code)
    b. This should result in seeing the original start menu.

Additional notes and requirements.

1. Your CSS and JavaScript files must be external.
2. All event listeners should be created in your script, not inline on the HTML element itself.
3. Style the game with a theme of your choice (not the default blue and white).

See below for my Halloween themed version! You can view a video walkthrough via: https://gonzagau-my.sharepoint.com/:f:/g/personal/olivares_gonzaga_edu/EnjtNlF7JaFFrAkPzTbTdvYBTrUgLB890pKKZAAMTZQekA?e=Cwcgft

Figure 1. Default Screen

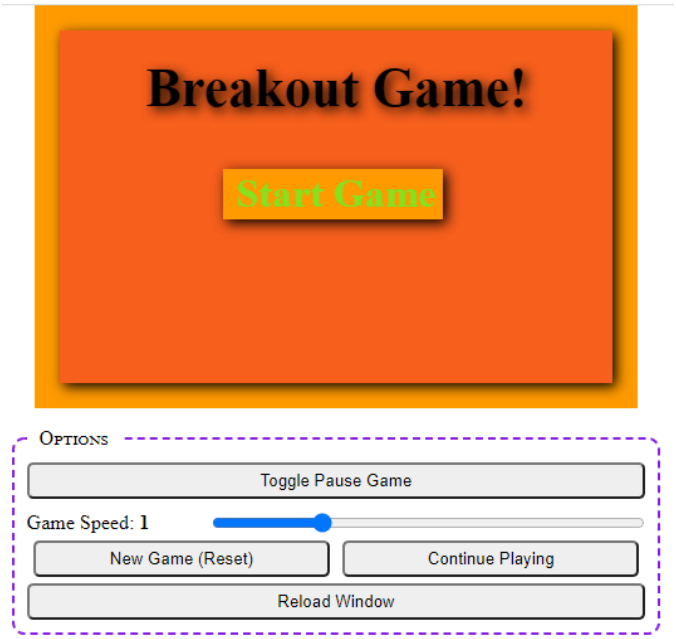

Figure 2. Game screen after clicking the canvas "Start Game" button

Figure 3. Game over when lives are <= 0

Figure 4. Winning screen when all bricks have been hit.

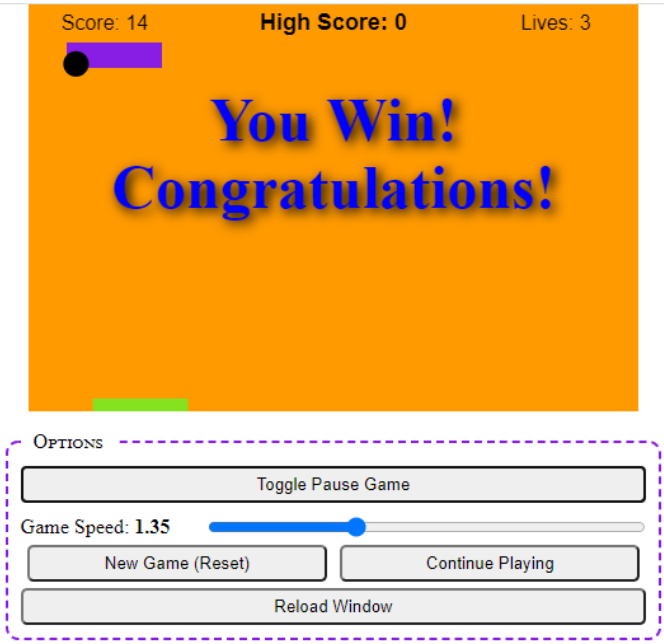

Figure 5. High score is updated when clicking the "Continue Playing" button after winning a game

Figure 6. Additional games played using the Continue Playing button results in high score being accumulated.

Part 2: GitHub Classroom Submission

Part of the submission will require you to push your local repository to the GitHub Classroom remote repository. Follow the tutorial mentioned previously in this document to do so. You should start by cloning the starter repository and then modifying the code from there.

Part 3: Uploading your website to a remote host (GitHub Pages)

See the documentation from the previous assignments, the process will be the same.

Grading Guidelines

This assignment is worth 100 points. Your assignment will be evaluated based on a completeness of your submission and adherence to the web page requirements. For this assessment, the **emphasis is on your use of JavaScript features** throughout your web page. We will grade according to the following criteria:

- 30 pts for using the canvas
    - 10 pts for Creating a start menu that including title text and a start game "button"
    - 3 pts for the start button styled using shadows
    - 2 pts for the start menu smaller than the canvas
    - 5 pts for displaying the high score accumulating for each game a player wins and clicks "Continue Playing"
    - 5 pts for pausing the game on a win/loss
    - 5 pts for output of win/loss messages rendered on the canvas
- 35 pts for In an HTML container below the canvas for an options menu
    - 3 pts for Pause game button that toggles the game pause/play state
    - 7 pts for a change speed slider that modifies the ball speed multiplier between 0.05 and 4 in 0.05 step increments with a default of 1
    - 5 pts for a New Game (Reset) button that clears the high score and score, resets lives back to 3, resets the board bricks, and resets the ball position
    - 10 pts for a Continue Playing button that clears the score, accumulates the high score from the running total, keeps lives at the current count, resets the board bricks, and resets the ball position
    - 5 pts for a Reload Window button that reloads the window to show the main menu
    - 5 pts for creating all event listeners in your script and not inline on the HTML element itself
- 35 pts Misc.
    - 5 pts for Style the game with a theme of your choice (not the default blue and white).
    - 5 pts for use of external CSS and JavaScript files
    - 5 pts for a block **comment** at the top of the page with your name, the class name, assignment name, and last modified date.
    - 5 pts for passing the **validator** website check with no errors or warnings: https://validator.w3.org/
    - 5 pts for your GitHub Pages URL loading successfully **(You are responsible for verifying this)**
    - 10 pts for adhering to directions and following formatting / "best practices" as discussed in the course zyBook section 3.7