Project Presentation - Module 2 Intro to JavaScript

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1) Project topic I chose is a 2D Space Invaders game web app written in JavaScript, HTML and CSS. In this single player game, a player has to pass all 12 levels, with different enemies at each level which the player needs to destroy to win. If the player loses all its lives, the game is over. Score is based on the number of enemies and dangerous objects (asteroids) destroyed before the game is won.
I succeeded in developing this game to a degree that meets all my MVP outline expectations, with main menu UI, options customization features, high score saving, etc.

2) Problems and difficulties I ran into:
   - z-index bug involving objects on the canvas, I fixed this by properly ordering the processing of object arrays in the animate() function, which is the main animation function for the game
   - bugs with asteroid count increase, fixed by introducing a new variable asteroidCount to act as an upper limit to random asteroid object generation at each level increase, asteroidCount increased as level went up
   - bug that prevented Boss2's outer projectiles to reach bottom of canvas; fixed by separating the laser class from outer boss projectile classes and processing them in animate() function separately
   - bug that allowed user to start the game with 0 or undefined number of lives, by selecting New Game, skipping difficulty selection by clicking on Main Menu button, and then starting a new game again; fixed by making it required for the user to select difficulty before game animation is initiated, by disabling the Continue button from appearing until difficulty has been selected
   - bug that froze the application when boss2's laser shot the player, fixed by making the whole game animation stop immediately when the player loses all lives, unlike previous solution that would stop the animation 2 seconds after player loses all lives -> this required a change of timeout value in setTimeout for gameOver() function

3) Some features I completed easily were: majority of code involving main menu UI and Bootstrap classes used for it; change of enemy design and asteroid design with level increase, option to turn sounds on/off; option to change player spaceship design; option to change canvas background color; adding sounds to the game; adding Help button and its functionality

4) Features I struggled with were boss enemy projectiles and lasers; menu UI buttons appearing and disappearing depending on the point of main menu traversal; making asteroids and planets spawn completely randomly in the canvas background; setting the conditions and functionality for ending the game either by defeat or win; difficulty selection and saving difficulty information in local storage in scoreRecord objects, and sorting those objects correctly based on difficulty category

5) Things I learned from this project are:
   - working alone gives you flexibility and lots of room for your own decision making, not having to wait on and adjust with other people's schedules and working challenges

- no project no matter how large should seem intimidating, even if you work on it alone, because with enough effort, time and resources it can be either completed fully or its progress can reach satisfactory level of completion
- coding up video games like Space Invaders with various effects, animations, and potentially quite a lot of details is not as hard and complex as it may seem at first when we simply play the game and think about how to actually create it
- It is important to be patient with yourself and show understanding for your own errors, progress challenges, and occasional lack of motivation or fear of failing - all these things are normal and are best overcome by simply starting to work and not thinking much about results
- Canvas API syntax for creating 2D animations in JavaScript/HTML technology, and how it can be used to make interactive games

6) I decided to create a Space Invaders game because I always wanted to code my own game and then play it in my free time, and I always thought that video games are not easy coding projects. Thus I imagined my game to be a cool addition to my portfolio and resume.
I picked JS/HTML/CSS technology set to make this application because JavaScript has Canvas API, a very straightforward framework great for making animations in web apps, and also because in this internship we mostly work with JavaScript, HTML, and CSS, and their frameworks.

7) With 20 more hours at my disposal to invest in this project, I would think about turning it into a multiplayer online game for two players. I would also add some extra features to the game such as exploding stars that when hit destroy many surrounding invaders around them, bonus items that increase player spaceship's projectile fire rate or type of cannon the player has to shoot projectiles (maybe a laser, or rockets to fire at invaders).