**Game introduction**

The game is built on the basis of recursion functions, where the function is being called inside itself to create a loop. By using this method, the canvas is being erased and drawn on at an interval set via the game speed. Added a few more functionalities to the basic code. The functionalities are as follow:

1. Start button – Game now starts when start button is triggered.
2. Stop button – Game pauses when triggered. Game resumes at its last paused place when start button is triggered. This is done by creating a variable named “pause”. When stop is called, the variable will be set to true, which will return the related functions without running their supposed methods and changing the pause variable to false. So when start is triggered, the functions will run as per normal.
3. Restart button – Game restarts when triggered by reloading the page.
4. Game difficulty – Allow user to select speed of the snake. This is a required field before the game can start.
5. High Score function is now added. High score is now stored in the local storage. High score is only updated if current score is higher than high score. A reset function is also available to reset the high score.
6. Different fruits are added in:

Red – increase score by 10 when eaten

Purple – decrease score by 10 when eaten  
Black – score becomes zero, only appears when score is multiple of 3  
Green – increase score by 50 and body length by 5, only appears when score is multiple of 3

1. Speed in game gradually increases as score gets higher. Color of the snake changes as well at certain score.

**Test scenarios:**

* Start button should start the game
* Stop button should pause the game. Upon clicking start button, game should resume
* Score should always be 0.
* Restart button should refresh the page
* Drop down box of select difficulty should have first entry as blank or “Select”
* If drop down box is not filled, game should not run.
* Prompt box asking user to select difficulty should pop up when trying to start the game without selecting difficulty.
* Dropdown box should be highlighted when prompt box is closed.
* Reset button should reset “Highscore” to 0
* Arrow keys keypresses should be working as intended to control the snake movements.
* When game starts, when snake eats the fruit, the fruit should disappear, a new fruit appear elsewhere, score increase by 10 and snake length increase by 1. Black and green fruits should only appear when score is multiple of 3 and disappear if score is not.
* When special fruits are eaten, they should display their expected behaviour as explained in the earlier section.
* Game should end when snake touches the canvas perimeter.
* Upon end of game, start, stop and the dropdown box should be disabled. User has to click restart to start over.
* At end of game, canvas should disappear and high score is displayed
* Score should be displayed on top. If there is no high score, the high score should be updated with the current end score. If the score is lesser than the high score, high score should remain as it is.

**Bugs:**

* Sometimes the game ends when snake head is one square away from border. Have yet to find out the cause of it.
* Sometimes the score resets itself, or decrease by 10. Didn’t manage to reproduce bug as and when to see the exact outcome.

**Future Improvements:**

* Enabling keystrokes for the start, pause and restart buttons.
* Spawning the special fruits at different locations in set intervals. (Yet to figure out why clearInterval does not clear the interval when pause)
* Altering shape of snake to look more like a snake.
* Change the color of the head.
* Modifying restart such that instead of refreshing the page, game could be restarted without a refresh.
* Display a start page before game starts
* Creating obstacles when score reaches certain checkpoint.
* Creating a new mode where there are no walls (going through the walls will bring snake back from the other end) and game only ends when snake hits itself.
* Set special fruits to blink indicating bonus/danger.
* Time challenge mode whereby game ends in certain duration with a playing field.
* Creating a “portal” whereby when snake enters through the portal, it will exit at another location on the canvas.