University of Washington, CSE 154
Homework Assignment 8-B: Fifteen Puzzle
EXTRA FEATURES / CSE Majors Features

CSE majors (B section) must complete **at least one (1)** of the following extra features to add new functionality to the program. If a CSE major completes more than one extra feature successfully, they earn +1 extra late day for use on a future assignment (*after* HW8). (Not +1 late day per additional feature completed; +1 overall.)

Non-CSE majors (A section) are not required to complete any of these extra features, but if they do, *each* optional feature completed is worth +1 late day for use on a future assignment (*after* HW8), up to a maximum of +2.

Regardless of how many additions you write, the page behavior and appearance should still work as described in the main spec document. If you have a different idea for an extra feature, please ask us and we may approve it.

If you choose to do any of these extra features, **indicate in your file's comment header** which one(s) you did.

Extra Feature #1. Ability to Slide Multiple Squares at Once

Make it so that if you click any square in the empty square's row or column, even ones more than one spot away from the empty square, all squares between it and the empty square slide over. (Much more pleasant to play!) If you do this extra feature, make it so that all movable squares (including ones several rows or columns away from the empty square) highlight on hover as described before.

Extra Feature #2. Animations and/or Transitions

Instead of each tile immediately appearing in its new position, make them animate. You can do any sort of animation or other styling, as long as the game ends up in the proper state after a reasonable amount of time.

It can be tricky to implement animation yourself. You could do animation using a timer such as with the `setInterval` function. Or you could use a CSS3 transformation as shown in the Extra Sessions. One source of bugs is when the user tries to click pieces quickly before the previous move is done animating. Your puzzle should not have buggy behavior or errors if the user tries to do this. It's fine to disable/ignore clicks on puzzle squares that occur during animation, so that it is not possible to make another click until the previous click is done animating.

Extra Feature #3. Game Time and Moves Counter

Keep track of the game time elapsed in seconds and the total number of moves, and when the puzzle has been solved, display them along with the best time and fewest total moves seen so far. If you do this feature, you should store both of those "best" values in your `localStorage` so that if the user comes back later it will remember them.

You can implement this feature using a timer and the `setInterval` function in JavaScript. It's fine to just show the total seconds needed, or if you want to split it into minutes and seconds, that is fine, too.

Extra Feature #4. Different Puzzle Sizes

Place a control on the board to allow the game to be broken apart in other sizes besides 4x4, such as 3x3 or 6x6. It doesn't need to be possible to change the board size in the middle of a game; changing the size should reset the board back to an initial "solved" state for that board size. You can either use a drop-down box of available board sizes, or allow the user to type in their own board size.

The overall puzzle size should stay at 400x400. This means that each square's size must change if you change the number of rows and columns; for example, if it is a 5x5 game, each square is 80x80 rather than 100x100. Certain sizes don't evenly divide into 400, such as 6x6. In such a case, just choose the nearest integer to the proper size.