W04D3: Sudoku Validator

Fullstack Academy

TODAY'S AGENDA

- **Synthesize fundamental concepts learned so far**
  - Iteration (loops)
  - Data Types (Nested Arrays)

SUDOKU

						2		
	8				7		9	
6		2				5		
	7			6				
			9		1			
				2			4	
		5				6		3
	9		4				7	
		6						

(a) Sudoku Puzzle

9	5	7	6	1	3	2	8	4
4	8	3	2	5	7	1	9	6
6	1	2	8	4	9	5	3	7
1	7	8	3	6	4	9	5	2
5	2	4	9	7	1	3	6	8
3	6	9	5	2	8	7	4	1
8	4	5	7	9	2	6	1	3
2	9	1	4	3	6	8	7	5
7	3	6	1	8	5	4	2	9

(b) Solution

SUDOKU

- **Popular number puzzle from Japan**
- **Players fill in 9 x 9 Grid of Numbers**
- **A board is “solved” if:**
  - Numbers [1-9] are used ***only once*** per row *(no repeats!)*
  - Numbers [1-9] are used ***only once*** per column *(no repeats!)*
  - Numbers [1-9]s are used ***only once*** per 3x3 mini-grid *(no repeats!)*

SUDOKU SOLVER

- Create a function to check if a Sudoku board is valid
- Your function should return **true** if the board is valid, **false** if it isn’t

SUDOKU SOLVER - RESTATE

- Create a function that takes an array of arrays of integers as an argument, representing a Sudoku Board
- My function will return a Boolean, based on whether the Sudoku solution is valid

SUDOKU SOLVER - EXAMPLES

```
var validPuzzle = [
    [ 8,9,5,   7,4,2,   1,3,6 ],
    [ 2,7,1,   9,6,3,   4,8,5 ],
    [ 4,6,3,   5,8,1,   7,9,2 ],

    [ 9,3,4,   6,1,7,   2,5,8 ],
    [ 5,1,7,   2,3,8,   9,6,4 ],
    [ 6,8,2,   4,5,9,   3,7,1 ],

    [ 1,5,9,   8,7,4,   6,2,3 ],
    [ 7,4,6,   3,2,5,   8,1,9 ],
    [ 3,2,8,   1,9,6,   5,4,7 ]
];
```

```
var invalidPuzzle = [
    [ 8,9,5,   7,4,2,   1,3,6 ],
    [ 2,7,1,   9,6,3,   4,8,5 ],
    [ 4,6,8,   5,8,1,   7,9,2 ],

    [ 9,3,4,   6,1,7,   2,5,8 ],
    [ 5,1,7,   2,3,8,   9,6,4 ],
    [ 6,8,2,   7,5,9,   3,7,1 ],

    [ 1,5,9,   8,7,4,   6,2,3 ],
    [ 7,4,6,   3,2,5,   8,1,9 ],
    [ 3,2,8,   1,9,6,   5,2,7 ]
];
```

SUDOKU SOLVER - APPROACH

- Write helper functions to get array for a specific row, column, or subsection
- Write a helper function to validate a specific row, column, or subsection
- Loop over each of the 9 rows, columns, subsections, and validate each.
  - If any isn't valid, return **false**. Otherwise, return **true**

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SUDOKU SOLVER - CODE

- When you feel confident in your approach, translate it to code

- Remember to break down complex logic into smaller helper functions