

CS70 Puzzle Set #1

March 1, 2017

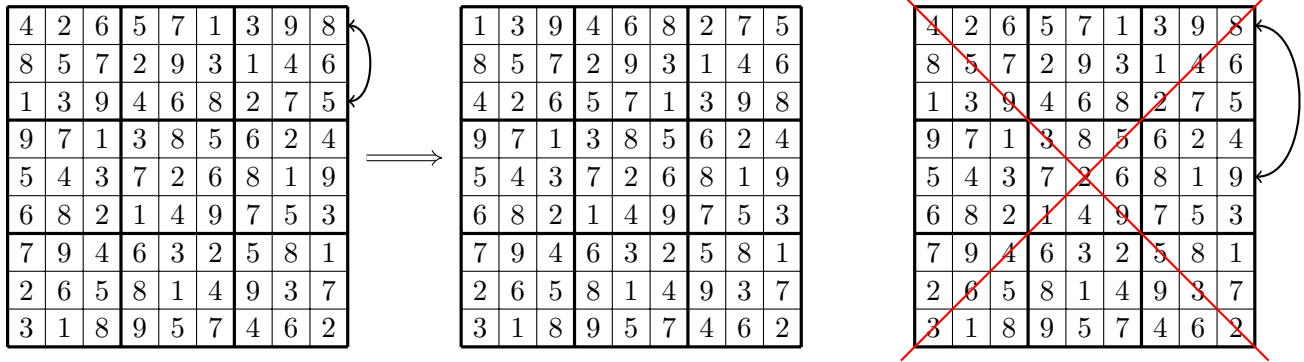
1. Fill in the Sudoku grid like a normal Sudoku grid; however, with the additional constraints that each of the blue shaded squares must also have one of each of the numbers 1 through 9

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

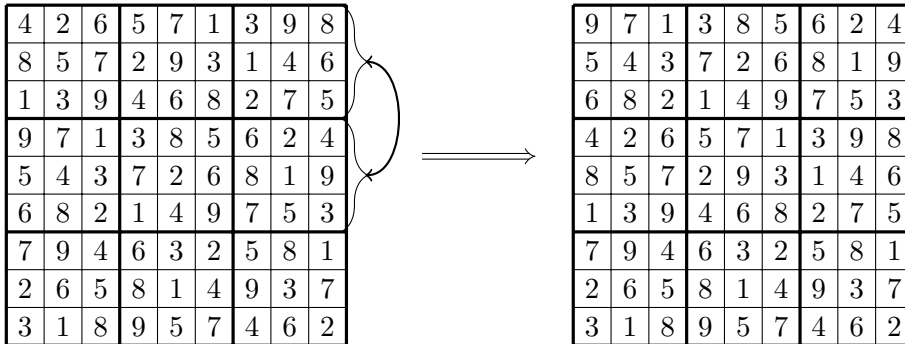
Something interesting of note for ordinary sudoku puzzles certain operations on the board will still maintain its validity as a solution.

Here are a list of the operations one can use:

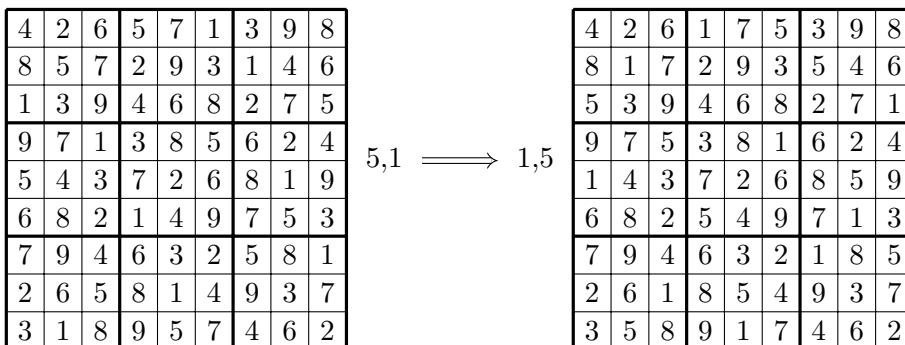
- Switching rows or columns within a box group:



- Switching box groups row-wise or col-wise:



- Switching every number of one kind with another



2. Using the above mentioned operations turn the following sudoku puzzle solution into one that satisfies the constraints mentioned in the first problem.

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

Two possible move sets to achieve a valid board are:

- $[[s, r, 4, 6], [s, r, 7, 9], [s, c, 2, 3], [s, c, 7, 9], [b, r, 2, 3], [b, c, 1, 2], [b, c, 1, 3]]$ (by <banana emoji>)
- $[[s, c, 1, 3], [b, c, 1, 2], [b, r, 1, 2], [b, r, 2, 3], [s, r, 7, 9], [s, c, 4, 5], [s, c, 1, 3]]$ (by Shoulda Woulda Sudoowodo Sue Dough Coup)

With format like so:

$[sb, rc, \#, \#]$

s - swapped single row/column

b - swapped blocks (groups of 3 rows/columns)

r - swapped rows

c - swapped columns

$\#, \#$ - the first row/column/value swapped with the second row/column/value

Examples being:

$[s, r, 1, 2]$ - this swaps the first row with the second row

$[b, c, 3, 1]$ - this swaps the third block column with the first block column

3. Solve the following Sudoku puzzle with the same constraints as before:

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