

Problem 11214

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Proposed by S. W. Golomb (USA).

A Sudoku solution is a 9×9 array with integer entries such that each of the nine possible entries occurs exactly once in each row, once in each column, and once in each of the nine 3×3 subsquares that together tile the main arrays. Is it possible for two Sudoku solutions to form a pair of orthogonal Latin squares?

Solution proposed by Roberto Tauraso, Dipartimento di Matematica, Università di Roma "Tor Vergata", via della Ricerca Scientifica, 00133 Roma, Italy.

The answer is yes. These two Sudoku solutions are orthogonal:

	<i>Id</i>	<i>Down</i>	<i>Up</i>
<i>Id</i>	1 2 3	4 5 6	7 8 9
	4 5 6	7 8 9	1 2 3
	7 8 9	1 2 3	4 5 6
<i>Left</i>	2 3 1	5 6 4	8 9 7
	5 6 4	8 9 7	2 3 1
	8 9 7	2 3 1	5 6 4
<i>Right</i>	3 1 2	6 4 5	9 7 8
	6 4 5	9 7 8	3 1 2
	9 7 8	3 1 2	6 4 5

	<i>Id</i>	<i>Down</i>	<i>Up</i>
<i>Id</i>	1 2 3	7 8 9	4 5 6
	4 5 6	1 2 3	7 8 9
	7 8 9	4 5 6	1 2 3
<i>Right</i>	3 1 2	9 7 8	6 4 5
	6 4 5	3 1 2	9 7 8
	9 7 8	6 4 5	3 1 2
<i>Left</i>	2 3 1	8 9 7	5 6 4
	5 6 4	2 3 1	8 9 7
	8 9 7	5 6 4	2 3 1

Each 3×3 subsquare is obtained by applying the corresponding shifts to the 3×3 subsquare in the upper left corner. □