On Pandiagonal Strongly Symmetric Self-Orthogonal Diagonal Latin Squares (PSSSODLS)

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1 Abstract

- This is a brief note to describe the PSSSODLS(9) I discovered via Minion on 6/12/11.
- This note should emphasise Minion and be close to other articles published in the Minion community.

2 Introduction

- On 6 December 2011, via Minion, I found the following candidate for PSSSODLS(9)

$$\begin{bmatrix} 0 & 1 & 2 & 6 & 7 & 8 & 3 & 4 & 5 \\ 8 & 6 & 7 & 5 & 3 & 4 & 2 & 0 & 1 \\ 4 & 5 & 3 & 1 & 2 & 0 & 7 & 8 & 6 \\ 1 & 2 & 0 & 7 & 8 & 6 & 4 & 5 & 3 \\ 6 & 7 & 8 & 3 & 4 & 5 & 0 & 1 & 2 \\ 5 & 3 & 4 & 2 & 0 & 1 & 8 & 6 & 7 \\ 2 & 0 & 1 & 8 & 6 & 7 & 5 & 3 & 4 \\ 7 & 8 & 6 & 4 & 5 & 3 & 1 & 2 & 0 \\ 3 & 4 & 5 & 0 & 1 & 2 & 6 & 7 & 8 \end{bmatrix}$$

- Later, on 9 December 2011 (while volunteering at Oxfam and reading my email on a break) I noticed that this sucker is also a Sudoku!
- On 15 December 2011, also via Minion, I found the following candidate (CHECK) for $PSSSODSUDOKU(9)$ which displays a lot of structure that could be exploited for combinatorial constructions of larger orders:

$$\begin{bmatrix} 5 & 6 & 1 & 8 & 0 & 4 & 2 & 3 & 7 \\ 8 & 0 & 4 & 2 & 3 & 7 & 5 & 6 & 1 \\ 2 & 3 & 7 & 5 & 6 & 1 & 8 & 0 & 4 \\ 3 & 7 & 2 & 6 & 1 & 5 & 0 & 4 & 8 \\ 6 & 1 & 5 & 0 & 4 & 8 & 3 & 7 & 2 \\ 0 & 4 & 8 & 3 & 7 & 2 & 6 & 1 & 5 \\ 4 & 8 & 0 & 7 & 2 & 3 & 1 & 5 & 6 \\ 7 & 2 & 3 & 1 & 5 & 6 & 4 & 8 & 0 \\ 1 & 5 & 6 & 4 & 8 & 0 & 7 & 2 & 3 \end{bmatrix}$$

3 Models of PSSSODLS

In this section we present constraint models of $PSSSODLS(n)$.

4 Implementing Models of PSSSODLS

In this section we demonstrate how to implement the model of the previous section in the constraint modelling language Minion.

5 A Generator for Models of PSSSODLS

In this section we discuss how to implement a generator of the Minion model using Python.

See the script at PSSSODLS generator gist on Github.

6 Some Experimental Results

7 Conclusion and Future Directions

References