Magic squares and orthogonal arrays

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A *magic square* is an n by n array of integers with the property that the sum of the numbers in each row, each column and the the main and back diagonals is the same. This sum is the *magic sum*.

The square is *n-th order* if the integers $1, 2, 3, \ldots, n^2$ are used

Example:

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

$n = 4 \qquad \text{magic sum} = 34$

Magic squares have had a long and colorful history. They have attracted the attention of Emperor's, Statesmen, hobbyists, magicians and yes even mathematicians. In this talk we show how Magic Squares are connected with pairs of orthogonal Latin squares. This connection and recursive constructions are then used to show that a Magic square exists for all orders n, except $n = 2$.

An investigation of the existence of pairs of orthogonal Latin squares is also included.