A Latin square of order \( n \) is an \( n \times n \) matrix where each row and column is a permutation of the integers \( 1, 2, \ldots, n \). Two Latin squares \( A \) and \( B \), both of order \( n \), are orthogonal if all \( n^2 \) ordered pairs formed by juxtaposing the two matrices are unique. It is well known that there exists a pair of orthogonal Latin squares of order \( n \) for every positive integer \( n \neq 2, 6 \). A family of mutually orthogonal Latin squares (MOLS) of order \( n \) is a collection of Latin squares of order \( n \) such that each Latin square in the collection is orthogonal to every other Latin square in the collection. It is relatively easy to show that the maximum size of a collection of MOLS of order \( n \) is \( n - 1 \).

A gerechte design is a \( n \times n \) matrix where the matrix is partitioned in \( n \) regions \( S_1, S_2, \ldots, S_n \) where each row, column and region is a permutation of the integers \( 1, 2, \ldots, n \). The popular puzzle Sudoku is an example of a gerechte design.

Results about mutually orthogonal Sudoku Latin squares of order \( n = k^2 \) are beginning to appear in journals. This talk discusses the adjustments that must be made when \( n \) is not a perfect square and the size of critical sets (clues) of mutually orthogonal Sudoku Latin squares. (Received September 13, 2011)