

Subsquares of Latin squares

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Abstract

A *Latin square* is a matrix in which each row and column is a permutation of the same set of symbols. A *subsquare* is any submatrix which is itself a Latin square. Every Latin square of order n trivially has n^2 subsquares of order 1 and one subsquare of order n . Any subsquare between these two extremes is *proper*. Subsquares of order 2 are called *intercalates*. A Latin square without intercalates is said to be N_2 and a Latin square without proper subsquares is said to be N_∞ .

In this talk I will survey results and open questions relating to the number of subsquares in a Latin square. We might be trying to minimise or maximise this number, or to understand its distribution among all Latin squares of a given order. The existence question for N_2 Latin squares was settled a long time ago, but the corresponding question for N_∞ Latin squares has only just been settled. There has also been exciting recent progress on understanding the distribution of intercalates among Latin squares of order n . But many questions remain.