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Forbidden Configurations: Progress towards a Conjecture

A conjecture of Anstee and Sali predicts the asymptotic bounds that result when forbidding a single configuration. Define a matrix to be $simple$ if it is a (0,1)-matrix with no repeated columns. For a given (0,1)-matrix F, we say a matrix A has no $configuration\ F$ if there is no submatrix of A which is a row and column permutation of F. Letting $|A|$ denote the number of columns in A, we define forb$(m, F) = \max\{|A| : A$ is m-rowed simple matrix with no configuration $F\}$. The conjecture gives an integral valued function $f(F)$ and claims that forb(m, F) is $\Theta(m^{f(F)})$. The function $f(F)$ is determined by considering various possible product constructions that avoid F. One value of the conjecture is that it predicts critical configurations F to consider. We describe some recently proven critical cases and some proof ideas. This is joint work with M. Raggi and A. Sali.