Abstract: A problem in extremal set theory takes the form of determining the maximum number of subsets of \( \{1,2,\ldots,m\} \) you can choose so that the resulting family of subsets has some property. The property I will consider is a `trace' being forbidden. A `trace' of a set system, given a set \( S \), is the new family of sets formed by intersecting the sets of the original family with \( S \). An incidence matrix encodes the system of subsets as an \( m \)-rowed \((0,1)\)-matrix \( A \) with no repeated columns. The forbidden trace becomes a `forbidden configuration' namely for some given \((0,1)\)-matrix \( F \) you are forbidding \( A \) from having any submatrix which is a row and column permutation of \( F \).

One defines \( \text{forb}(m,F) \) as the maximum number of columns, over all \( m \)-rowed \((0,1)\)-matrices with no repeated column and no submatrix which is a row and column permutation of \( F \). This concept of forbidden configurations has many results of which the study of VC-dimension has been the most notable. I will discuss a number of the bounds obtained and the interesting variety of proofs.