1 . What is the greatest number of rooks which can be placed on an *n* X *n* chessboard in such a

way that none of them controls the square on which another lies? In how many different ways

can this be done?

ANS : A rook controls all squares of its row and column, up to and including the first square

occupied by another piece. An *n* x *n* chessboard ( where the case *n* = 8" is illustrated)

has *n* rows and *n*  columns. For none of the rooks on the board to control the square on which

another lies, it is necessary and sufficient that no two rooks lie in the same row or in the same

column. Hence the total number of rooks cannot exceed *n;*

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In particular, for an ordinary chessboard (that is, for *n* = 8), we obtain:

8! = I . 2 . 3· 4 . 5 . 6 . 7 . 8 = 40,320 different arrangements.