# Question 2

It is a max flow problem.

For the bishop, there are k white bishops at the cell

As bishop goes diagonally, we cannot put rooks on this position.

We make a bipartite graph with all columns as vertices on the left-hand side. Connect each column with the super source by a directed edge of capacity equal to the 1.

Then, make all rows as vertices on the right-hand side. Connect each row with the super sink by a directed edge of capacity equal to the 1 and in this edge. And on each edge we need check the validity of the path. We make a judgement on the cell which can be represented as .

the path is not feasible solution we need give up this path.

Because we set the each edge capacity is 1, no two rooks are in the same row or in the same column.

Therefore, we construct a bipartite graph and turn this question into the flow network.

Using the Ford - Fulkerson algorithm to get the max flow which is the largest number of black rooks you can place on the board.