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Question4:

Lets create a biparite graph with a(column) and b(row) as the vertices, all the a from a0 to an in the same side and all the b b0 to bn in the other side.

Create a super source linked to all a with ci = 1 since no two black rooks can in the same column
Create a super sink linked to all b with ci =1 since no two black rooks can in the same row

Do

1 . for every ai from 0 - n, check for every bi from 0-n, if (ai,bi) not under the attack of any of the k bishops, ci = 1, else ci = 0

2. Use max-flow algorithm to get the maximum flow, which is the largest number of black rooks that can place on the board

Time complexity no more than O(n^3)