UC Berkeley
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EE126: Probability and Random Processes

Discussion 1
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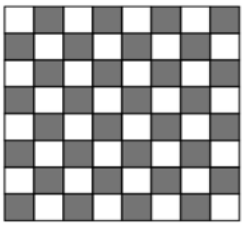
Problem 1. Consider the following empty chess board.



(i)

Imagine placing 8 rooks on a chessboard. What is the probability that each rook is safe from all the others?

Problem 2. Consider a sphere that has $\frac{1}{10}$ of its surface is colored blue, and the rest is red. Show that, no matter how the colors are distributed, it is possible to inscribe a cube in the sphere with all of its vertices red.
Hint: Carefully define some relevant events

Problem 3. There are n urns of which the rth contains $r-1$ red balls and $n-r$ blue balls. You pick an urn at random and remove two balls at random.

(a) Find the probability that the second ball is blue.

(b) Find the probability that the second ball is blue, given that the first is blue.