

IC 252 Data Science II  
Assignment 1

Q1. A startup company has 5 founders. The company wants to choose a board of two officers, the CEO and CTO. Assuming that these officers are chosen at random, what is the probability that the officers are Satyajit as CEO and Dileep as the CTO (assume that there is only one Satyajit and one Dileep among the 5 founders).

Now, write a general program to compute the above probability for N founders for M board positions (assume that there is only one unique name for each board position among the N founders). Please accept N and M from the user.

Q2. A game uses 32 unique cards. These cards come four suits (diamonds, hearts, clubs, and spades). Cards are numbered 1 to 8 in each suit. A hand is a collection of 8 cards, which could be sorted however the player chooses (so order of holding cards in the hand does not matter). What is the probability of getting all four of the 1s in a hand?

Now, write a general program to compute the above probability for N unique cards, which come from four suits (diamonds, hearts, clubs, and spades). Please assume a hand is a collection of D cards, where D can be any number from 6 to 8. Please accept N and D from the user.

Q3. Imagine two unbiased six-sided dice are thrown once and the total score is observed. Use a 1000-run simulation in a program to find the estimated probability that the total score is odd or greater than 8? Run the program multiple times and observe the run-to-run variations in the probability.