

PSO 1

Problem 1. Find the probability that a hand of five cards in poker contains four cards of one kind (i.e., four cards of the same rank).

Problem 2. What is the probability of generating the binary string 0011010 among all bit strings of length seven provided that each spot is generated independently and the probability of zero at any spot is equal to twice the probability of one?

Problem 3. Find the probability that a randomly selected k -digit decimal number is also a valid octal number (a number whose digits are between zero and eight).

Problem 4. Suppose you pick two cards, one at a time, at random, from an ordinary deck of 52 cards. Find (a) the probability that both cards are diamonds; and (b) the probability that the cards form a pair (they are the same).

PSO 2

Problem 1 What is more likely: rolling a total of 8 when two dice are rolled or rolling a total of 8 when three dice are rolled?

Problem 2. Urn 1 contains 2 blue tokens and 8 red tokens; urn 2 contains 12 blue tokens and 3 red tokens. You pick an urn at random and draw out a token at random from that urn. Given that the token is blue, what is the probability that the token came from urn 1?

Problem 3. Urn 1 contains 2 blue tokens and 8 red tokens; urn 2 contains 12 blue tokens and 3 red tokens. You roll a die to determine which urn to choose: if you roll a 1 or 2 you choose urn 1; if you roll a 3, 4, 5, or 6 you choose urn 2. Once the urn is chosen, you draw out a token at random from that urn. Given that the token is blue, what is the probability that the token came from urn 1?

Problem 4. Flip a biased coin, where the probability of heads is $3/4$ and the probability of tails is $1/4$, ten times. Find the probability of getting exactly nine heads; exactly seven heads; at least seven heads.