

COT 3100 Recitation #13: Probability 1 Problems
11/9/2020-11/13/2020

Problem Solved in Recording

1. The numbers 1, 2, 3, ..., 9 are randomly placed into the 9 squares of a 3 x 3 grid. Each square gets one number, and each of the numbers is used once. What is the probability that the sum of the numbers in each row and each column is odd?
2. Alice and Bob each choose a real number in between 0 and 1, with uniform distribution. What is the probability that the absolute value of the difference between their numbers exceeds .5?
3. Let N be a positive multiple of 5. One red ball and N green balls are arranged in a line in random order. Let $P(N)$ be the probability that at least 60% of the green balls are on the same side of the red ball. Observe that $P(5) = 1$ and that $P(N)$ approaches 80% as N grows large. What is the minimum value of N for which $P(N) < \frac{321}{400}$?
4. A coin is altered so that the probability that it lands on heads is less than $\frac{1}{2}$ and when the coin is flipped four times, the probability of an equal number of heads and tails is $\frac{1}{6}$. What is the probability that the coin lands on heads?

Problems for Recitation

1. If the number is selected at random from the set of all five-digit numbers in which the sum of the digits is equal to 43, what is the probability that the number will be divisible by 11?
2. Alex, Mel, and Chelsea play a game that has 6 rounds. In each round there is a single winner, and the outcomes of the rounds are independent. For each round the probability that Alex wins is 50%, and Mel is twice as likely to win as Chelsea. What is the probability that Alex wins three rounds, Mel wins two rounds, and Chelsea wins one round?
3. A pair of standard 6-sided dice is rolled once. The sum of the numbers rolled determines the diameter of a circle. What is the probability that the numerical value of the area of the circle is less than the numerical value of the circle's circumference?
4. Ten children are standing in line. Each child flips a fair coin. For each child whose coin lands heads, they get a candy. What is the probability that no two children who are adjacent in line both receive candy?