

Math 55: Homework 11

Due Wednesday, August 5

1. Ten standard six-sided dice are rolled one after the other. Call the n -th die *lucky* if it rolls the number n . What is the expected number of lucky dice?

2. A coin with a 60% chance of landing on heads is flipped 100 times. Use Chebyshev's inequality to put an upper bound the probability of getting at least 70 or at most 50 heads.

3. Three coins are flipped in a row. Let E be the event that all three land on heads and let F be the event that at least two are heads. Find the covariance of the indicator variables I_E and I_F .

4. Represent a standard six-sided die by a graph in the following way: Each face of the die is represented by a vertex, and two vertices are connected by an (undirected) edge if the two corresponding faces of the die are adjacent to one another.
 - (a) Draw the graph.
 - (b) How many edges does it have?
 - (c) Draw the complement graph.