Homework 7: Due Friday, April 17

Problem 1: In class on Monday, we calculated the number of sequence of zeros and ones or length 30 which

- Have exactly 15 zeros and 15 ones.

- Start with a one and end in a zero.

- Have exactly 5 "runs" of ones.

Calculate the number of sequence of length $m + n$ which have m ones, n zeros, and exactly k "runs" of ones (with no restriction on starting or ending digits).

Problem 2: Suppose that you roll a fair 10-sided die (with faces labeled from the number $1, 2, \ldots, 10$) ten times. What is the probability that every odd number occurs at least once? (*Hint:* Inclusion-Exclusion is your friend.)