

Homework 11

Due: In class on Wednesday November 10th

Solve the following problems from the lecture notes:

Exercise 7.2.14

Exercise 7.2.16

Suppose you roll a fair 6 sided die 100 times. Let X be the number of times two consecutive rolls result in the same number.

- (a) What is the $E[X]$?
- (b) What is the $V(X)$?

The conditional expectation of a random variable X on an event A is:

$$E[X|A] = \sum_x xp(X = x|A)$$

Prove that if the sample space S is equal to $A_1 \cup A_2 \cup \dots \cup A_k$ where A_i and A_j are disjoint for all i and j then:

$$E[X] = \sum_{i=1}^k E[X|A_i]p(A_i)$$