

Math 525 - Probability

Homework 4

1. Suppose we construct a random graph on $n = 4$ vertices with probability any two are connected by an edge $p = 1/4$. Consider the random variables X and Y as defined in Homework 3.
 - (a) Calculate the mean and variance of each random variable.
 - (b) Calculate the covariance and correlation coefficient with respect to the pair (X, Y) .
2. Complete exercises 3.1.1 and 3.1.5 from the text.
3. Complete exercises 3.2.1 and 3.2.5 from the text.
4. Complete exercises 3.3.2 and 3.3.5 from the text.
5. Suppose a smoker carries two matchbooks (each book with n matches), one in each of his front pockets. When he needs a match, he is equally likely to take from either pocket. At the moment he finds one of the books empty, what is the probability that the other book contains exactly k matches (here, $k \in \{0, 1, 2, \dots, n\}$).
6. Complete exercises 3.4.9 from the text.
7. Complete exercises 3.6.6 and 3.6.7 from the text.