

Recitation 5
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1. Suppose a random variable X can have only non-negative integer values. Show that

$$\mathbf{E}[X] = \sum_{x=0}^{\infty} \mathbf{P}(X > x) \quad .$$

2. Problem 2.27, page 124 in the text. **PMF of the minimum of several random variables.** On a given day, your golf score takes values from the range 101 to 110, with probability 0.1, independently from other days. Determined to improve your score, you decide to play on three different days and declare as your score the minimum X of the scores X_1 , X_2 , and X_3 on three different days.
- (a) Calculate the PMF of X .
- (b) By how much has your expected score improved as a result of playing on three days?
3. Problem 2.32, page 127 in the text. **D. Bernoulli's problem of joint lives.** Consider $2m$ persons forming m couples who live together at a given time. Suppose that at some later time, the probability of each person being alive is p , independently of other persons. At that later time, let A be the number of persons that are alive and let S be the number of couples in which both partners are alive. For any survivor number a , find $\mathbf{E}[S|A = a]$.