

Recitation Guide - Week 8

Topics Covered: Expectation

Problem 1: Elisa, as a busy college student, hasn't done laundry in weeks. In particular, she realizes that she has no more socks to wear, so she goes to the laundry room and throws in her 2 distinct pairs of socks. However, the machine is broken, and so it only returns 2 of her socks at random! Note that the two socks in a pair are also distinguishable.

- (a) What is the expected number of pairs that she can wear now?
- (b) What if she throws in n pairs and only gets k ($k > 1$) socks back?

Problem 2: Winnie starts the month with 500 dollars in her bank account. For each day i in the month of March ($i = 1, 2, \dots, 31$), Winnie flips a fair coin. If the coin flip results in heads, Winnie takes i dollars out of her bank account. If the coin flip results in tails, Winnie deposits 10 dollars into her bank account. What is the expected amount in the account at the end of March? You do not need to define the probability space.