

MTH U481: Summer 1 2005: Prof. Malioutov

Assignment 4

Due date: Tuesday June 7.

Reading: Chapters 4,5,6. (Random variables and Sampling)

1. Seven cards are drawn from a randomly shuffled standard deck of 52 cards. For each $i = 1, \dots, 7$ define

$$X_i = \begin{cases} 1 & \text{if the } i^{\text{th}} \text{ card is an Ace} \\ 0 & \text{if the } i^{\text{th}} \text{ card is not an Ace} \end{cases}$$

- Find the expected value of X_1 .
- Find the expected value of X_i , for all $i = 1, \dots, 7$.
- What does the number $X_1 + \dots + X_7$ equal?
- Find the expected number of Aces among these 7 cards.

2. p. 197, #28, #34,

3. p. 221, #4, #6, #8, #2, #10.

4. A circuit consists of nine resistors wired in series (one after another). Each resistor has a random resistance. Let σ be the standard deviation of these resistances (the same for all of them). It is required that the standard deviation of the combined circuit resistance (the last is the sum of the nine resistances) must be no greater than 15 Ohms. What is the maximum allowed value of σ ?

5. p. 194: #23, #24, #26.

6. p. 194: #1, #2.

7. p. 194: #10, #11.