

Assignment #12

Due on Wednesday, March 5, 2014

Read Section 4.1 on *Expected Value of a Random Variable* in the class lecture notes at <http://pages.pomona.edu/~ajr04747/>

Read Section 4.1 on *The Expectation of a Random Variable* in DeGroot and Schervish.

Do the following problems

1. A bowl contains 12 chips of the same size and shape. Four of these chips are red and the others are blue. Draw chips from the bowl at random, one at a time and **without replacement**. Let X denote the number of draws needed to get the red chip. Compute the expected value of X .
2. Let X have the pdf $f_X(x) = 3x^2$ for $0 < x < 1$, zero elsewhere. Consider a random rectangle whose sides are X and $1 - X$. Determine the expected value of the area of the rectangle.
3. In a class of 50 students, the number of students n_i in each age class i is shown in the following table:

Age i	n_i
18	20
19	22
20	4
21	3
25	1

If a student is to be selected at random from the class, what is the expected value of the student's age?

4. Suppose that one word is to be selected at random from the sentence

THE GIRL PUT ON HER BEAUTIFUL RED HAT.

If X denotes the number of letters in the word that is selected, what is the value of $E(X)$?

5. Suppose that one letter is to be selected at random from the 30 letters in the sentence given in the previous exercise. If Y denotes the number of letters in the word in which the selected letter appears, what is the value of $E(Y)$?