EE 131A | Homework Set 2
Probability | Wednesday, October 7, 2015
Instructor: Professor Roychowdhury | Due: Thursday, October 15, 2015

1. *Problem 2.35* A number x is selected at random in the interval $[-1, 2]$. Numbers from the subinterval $[0, 2]$ occur half as frequently as those from $[-1, 0)$.

   a) Find the probability assignment for an interval completely within $[-1, 0)$; completely within $[0, 2]$; and partly in each of the above intervals.

   b) Repeat *Problem 2.34* with this probability assignment.

2. *Problem 2.43* A Web site require that users create a password with the following specifications:

   - Length of 8 to 10 characters
   - Includes at least one special characters {!,@,#,$,%,ˆ ,&,*,(,),+,=,{,},|,<,>,\,_,-,[,],/,?}
   - No spaces
   - May contain numbers {0-9}, lower and upper case letters(a-z,A-Z).
   - Is case-sensitive.

   How many passwords are there? How long would it take to try all passwords if a password can be tested in a microsecond?

3. *Problem 2.46* Ordering a "deluxe" pizza means you have four choices from 15 available toppings. How many combinations are possible if toppings can be repeated? If they cannot be repeated? Assume that the order in which the toppings are selected does not matter.

4. *Problem 2.50* Five balls are placed at random in five buckets, What is the probability that each bucket has a ball?

5. *Problem 2.56* A lot of 50 items has 40 good items and 10 bad items.

   (a) Suppose we test five samples from the lot, with replacement, Let X be the number of defective items in the sample. Find P[X=k].

   (b) Suppose we test five samples from the lot, without replacement. Let Y be the number of defective items in the sample, Find P[Y=k].

6. *Problem 2.57* How many distinct permutations are there of four red balls, two while balls, and three black balls.

7. *Problem 2.59* Find the probability that in a class of 28 students exactly four were born in each of the seven days of the week.