STAT–S426/626 Homework Assignment 1

Due Thursday 09/08/2016

Remember (from syllabus): Solutions must be neatly word-processed (using Latex or a word processor) and stapled. Please annotate your work with brief, clear sentences explaining your approach and interpreting your results (you are not expected to write full-blown data analysis reports however). For assignments involving mathematical manipulations, students can write answers by hand provided penmanship is neat; illegible answers will be marked as incorrect.

1. Hoff 2.1

2. Hoff 2.3. Note that f, g and h are just functions. They are not necessarily densities.

3. Using R to simulate the experiment of rolling a fair six sided die.
   (a) Simulate rolling the die 50 times. How frequently a "1" came up (percent of time)? Compare with your expected probability of seeing a "1". What are the comparisons for "2", "3", "4", "5" and "6"? For each of these, compare the relative frequency and the probability.
   (b) Repeat the questions in (a) with a simulation of rolling the die 300 times.
   (c) Repeat the questions in (a) with a simulation of rolling the die 1000 times.
   (d) Make a graph to show all results in the above questions.
   (e) What do you conclude from these simulations?

   The main command you need to know for this data analysis is **sample**. It has two arguments and two options. Imagine drawing names from a hat. The command **sample** just picks a certain number of names from the hat. You have to tell R what hat to pick from and how many to pick. R can sample with and without replacement. With replacement means we pick a name out of the basket and put it back. Without replacement means we pick a name out of the basket and we don't put it back.