Math 151, Spring 2011
Jo Hardin, HW #13

Homework due on THURSDAY, APRIL 21^{th}, START OF CLASS.

1. DeGroot (3^{rd} or 4^{th} ed.), section 5.2: # 6, 7, 9, 10

2. DeGroot (3^{rd} ed. = section 5.11 or 4^{th} ed.), section 5.9: # 3, 5, 6

3. Here you are going to calculate some binomial probabilities. Look back to HW 5 to remember how to compute binomial probabilities in R.

   (a) The ASPC is booking a charter flight to San Francisco for spring break. They assume that some students will oversleep on the day of departure and won't make it to the flight. As a result, they decide to sell more tickets for the flight than seats on the airplane. Let p=0.98 be the probability that student shows up for the flight, and assume that the plane seats 100 people and they sold 105 tickets. What is the probability that someone is left at the airport when the plane departs? How many tickets should they sell to keep the probability that someone is stranded less than 0.10?

   (b) The doomsday airline operates both 2 and 4 engine planes. In order for the plane to make a safe trip, at least half of its engines must be functioning properly. You can calculate the probability of a safe trip for both a 2 engine and 4 engine plane assuming that the engines work independently of each other, where p denotes the probability of an engine not failing. Find the values of the probability p for which it is safer to travel in a 2 engine plane. (Hint: what are the binomial probabilities associated with a safe trip?)

4. Recall the Pass the Pigs example from the first few weeks of class (see link on website for that handout). The class results for each type of landing were as follows:

Landing	Count	Percent
Dot up	184	18.7%
Dot down	326	33.2%
Trotter	98	10.0%
Razorback	333	33.9%
Snouter	38	3.9%
Leaning jowler	3	0.3%

   Using what you know of the multinomial distribution, expectations, and whatever you think of as fair, assign a point value for each type of landing to create a *fair* game played by each contestant rolling one pig at a time. Note: there is no right answer for this problem. Explain the reasoning for your particular point allocation.