Stat 101 L – Homework 7

Due Wednesday, March 25, 2009

Homework is due on the due date at the end of the lab.

Reading:	March 2	Chapter 14
	March 4	Chapter 15
	March 9 – March 13	Chapters 16 & 18I

Assignment:

1. Below is a summary table of eye color and gender for students who took an introductory statistics course.

	Blue	Brown	Green	Hazel	Total
Female	313	291	175	156	935
Male	310	239	85	135	769
Total	623	530	260	291	1704

   If one student is chosen at random from the 1,704, what is the probability, round the final fraction to 3 decimal places, that:
   a) the student has blue eyes?
   b) the student is a female?
   c) the student has green or brown eyes?
   d) the student is a female and has green eyes?
   e) the student is male or has hazel eyes?
   f) the student is a female given we know the person chosen has green eyes?
   g) the student has hazel eyes given we know the person chosen is a male?
   h) Are the events green eyes and blue eyes disjoint events? Explain briefly.
   i) Are the events green eyes and female disjoint events? Explain briefly.
   j) Are the events green eyes and female independent events? Explain briefly.
   k) Are the events brown eyes and male independent events? Explain briefly.

2. Suppose an instructor offers students the following deal. Instead of taking the third exam in a course, the instructor will let them pick their grade from a bag that contains 5 A's, 7 B's, 11 C's, 1 D and 1 F. Two students decide to take the instructor up on the offer. The students begin to argue about who should go first. The instructor assures them that it doesn't matter as they both have the same chance of getting any grade.
   a) If sampling is done **with replacement** give the probabilities associated with getting each grade and explain why both students have the same chance of getting any grade.
   b) Suppose sampling is done **without replacement**? Demonstrate that the chance the second student to pick gets an F is the same as the chance that the first student to pick gets an F. Hint: Use a tree diagram to write out what can happen for the two students.

3. There are more male babies born in the U.S. than female babies. The probability of having a male baby is 0.512 and the probability of having a female baby is 0.488. Suppose that there are 3 births at a local hospital and that the births are independent of each other. Construct the probability distribution for the number of male babies for the 3 births at the local hospital. Hint: Use a tree diagram to write out that can happen on each of the births.