Decision Behavior: Theory and Practice (Davies, Winter 2007)

Problem set 2 (Feb. 13, 2007, due Feb. 20, 2007)

1. What psychological mechanism might explain why familiar events are judged more likely than unfamiliar ones?
2. Consider two six-sided dice (with faces varying from 1 to 6 dots) which are rolled simultaneously, and assume each roll is independent of the other. What is the probability that the sum of the two dice is 7?
3. Users of the iPod Shuffle have reported that they think songs are played nonrandomly, i.e. songs too often appear that are related to previous songs, or even the same. Explain how this judgment could come about as a result of the representativeness heuristic.
4. What is the probability mass function for last-name lengths in example 5.1.5?
5. According to Chebyshev's inequality, what is the upper bound on the probability that a student from the class in example 5.1.8 will have a last-name length differing from the class mean by 3 letters or more?
6. Suppose you want to estimate the average grade point average of Stanford students. Specifically, you want to be at least 95% sure that the real average is within 0.1 grade points of your estimate. Give a sample size and provide an argument that a random sample of that size or greater will give you an estimate within your desired margin of error.
7. How can the results of experiment 5.4.9 be explained by the heuristic of representativeness?
8. Give an original example of two quantities for which you would expect people's estimates to show a reversal of the inequality that actually exists between the two quantities.
9. Imagine an experiment in which subjects are asked to estimate the age of a famous movie star who is 65 years old. One group is first asked whether the star's real age is greater or lower than 80, and the other is asked whether it is greater or lower than 50. What pattern of results would you expect in this experiment and why? Is this a violation of anchor independence? Why or why not?
10. Having read about the pervasiveness of anchoring biases as explored by Oppenheimer et al. in 5.6.7, what corrective procedure might an individual apply to counteract this effect in everyday estimation tasks. Give an example.

EXTRA CREDIT:

11. Prove 5.3.3.
12. Prove lemma 5.4.6.
13. Apply the statistical theory we have outlined to make an argument that the small hospital in 5.4.9 is likely to have more days in a given year with 60% or greater male births than is the large hospital.