CSE 312: Foundations of Computing II
Quiz Section #3

1. Given 3 spades and 3 hearts, shuffle them. Compute P(E), where E is the event that the suits of the shuffled cards are in alternating order. What is your sample space?

2. Suppose you pick two cards from a well-shuffled Schnapsen deck. What is the probability that they are both queens?

3. Suppose you deal 13 cards from a well-shuffled bridge deck of 52 cards. What is the probability that the distribution of suits is 4, 4, 3, 2? (That is, you have 4 cards of one suit, 4 cards of another suit, 3 cards of another suit, and 2 cards of the last suit.)

4. Novice poker players are often confused about whether a flush beats a straight. For draw poker (see quiz section #2 worksheet, exercise #9):

   (a) Compute the probability of being dealt a flush.

   (b) Compute the probability of being dealt a straight.

   (c) Which of these hands should beat the other, given your answers to (a) and (b)?

5. In Schnapsen, suppose that ♠J is the face-up trump and you are dealt 5 nontrump cards. Let E be the event that the top 4 cards in the stock are all trumps. Let the sample space be all possible orderings of all the cards in the stock. Compute P(E). (Notice that your solution suggests a different and simpler sample space.)

6. Suppose you are taking a multiple-choice test that has c answer choices for each question. In answering a question on this test, the probability that you know the correct answer is p. If you don't know the answer, you choose one at random. What is the probability that you knew the correct answer to a question, given that you answered it correctly?

7. An urn contains 3 black balls and 4 white balls.

   (a) Suppose 3 balls are drawn from the urn without replacement. What is the probability that all 3 are white? Try computing this in the sample space where the order of the 3 draws does not matter, and then in the sample space where the order does matter.

   (b) Suppose 3 balls are drawn from the urn with replacement. What is the probability that all 3 are white? Describe the sample space precisely.

8. (Challenge problem) n people at a reception give their hats to a hat-check person. When they leave, the hat-check person gives each of them a hat chosen at random. What is the probability that no one gets their own hat back?