1. A random experiment is defined by simultaneously flipping 3 fair coins.

   a. Draw the sample space for this experiment assuming that the coins are colored and, therefore, distinguishable.

   b. For part (a) above, make a table that shows the probability for each outcome in the sample space.

   c. Draw the sample space for this experiment assuming that the coins are identicle and cannot be distinguished.

   d. For part (c) above, make a table that shows the probability for each outcome in the sample space.

   e. Suppose that event A is defined to be the occurrence of an odd number of Heads from the three coins. What is the probability that this occurs? Show your calculation for each sample space defined above.

   f. Suppose that event B is defined to be the event that an even number of Heads shows on the 3 coins. Is this event statistically independent from event A given in the previous part? Clearly explain why or why not.

2. A random experiment is defined by flipping a coin and tossing a 6-sided die.

   a. Draw the sample space, as the cross product space, for these two experiments.

   b. Make a table that shows the probability for each outcome of the cross product space.

   c. Suppose that A is the event that a Head occurs on the coin and suppose that B is the event that the die roll is odd. Are these two events statistically independent? Clearly show why or why not.

3. A random experiment is defined by drawing a single card at random from a deck of ordinary playing cards.

   a. What is the probability that the card is a heart?

   b. What is the probability that the card is an Ace?

   c. Illustrate the sample space with a partition according to suits.

4. A resistor box has 4 resistors of 10K, 8 resistors of 20K, and 3 resistors of 15K. You draw one resistor at random.

   a. Draw the sample space for this experiment. Draw the sample space so that the probability of each outcome is equal to the area of the outcome.

   b. What is the probability of drawing a 20K resistor?

   c. What is the probability of drawing a resistor value less than 18K?