Ling 473 Self Quiz

1. Two fair coins are tossed. One of them shows heads and the other rolls under the couch. What is that chance that the hidden coin is showing tails? For this problem, we are not looking for the *frequentist* answer, "50%".

2. There are two boxes. One contains two black marbles and two white marbles. The other contains four black marbles and one white marble. In this experiment, a box will be selected randomly, and then a marble will be drawn randomly from the selected box.

   a. What is the probability that the marble will be black?

   b. We run the experiment and it turns out that the selected marble is white. What is the probability that the first box was selected?

3. The college Linguistics club has 5 freshman males, 7 freshman females, and 6 sophomore males. How many sophomore females must be in the club in order for gender and class to be independent when a student is chosen at random from the club?

4. The linguistics section at the library has three books on Austronesian languages. We choose two linguistics books at random. The probability of them both being on Austronesian language is $\frac{1}{1650} = 0.000606061$. How many linguistics books are there?

5. A multiple choice exam is given. A problem has four possible answers, and exactly one answer is correct. The student is allowed to select as many answers as he likes. If his chosen subset contains the correct answer, the student receives three points, but he loses one point for each wrong answer in his chosen subset. What is the expected score?

6. A die is rolled T times until 6 is shown.

   a. What is the probability distribution for T?

   b. What is the expected value of T?

   Let E denote the event that $T > 3$. Let F denote the event that $T > 6$.

   c. Calculate $P(E)$.

   d. Calculate $P(F|E)$