Homework 10
Due at 6pm on Tuesday, October 4th.

To read:

1. Read the introduction and first two chapters of Benedict Carey's *How We Learn: The Surprising Truth About When, Where, and Why It Happens.*

To hand in:

1. Based on the two examples from class, make up your own Bayesian inference example. What are the likelihoods, prior, and evidence in your example? What is the posterior? How are they all related?

2. We have been thinking a lot about the probability that A and B happen. In these exercises you will think about the probability that A or B happens. Make up an example to explain the difference between A and B happening versus A or B happening in your own words.

3. In symbols we express A or B happening as $A + B$. Using our Venn diagram technique find a formula for the probability
$$P(A + B)$$
in terms of the probabilities $P(A)$, $P(B)$, and $P(AB)$.

4. How does your formula change when A and B are mutually exclusive? That is, what is the new formula when it is not possible that an event is both described as being A and being B. [Hint: If you are struggling with this, go back to your example from 2. and try modifying it so that A and B are mutually exclusive.]