Exercise 2

Due date: May 22, 2018 at class

1. Consider drawing a ball from an urn. There are two urns A and B, where A contains 1 red out of 10 balls, whereas B has 5 out of 10. You don't know from which you are drawing. Now,
   (a) You draw a ball from the urn and it was not red. Calculate the probability that the urn from which urn you drew was A. (ANSWER: This is the example in p.1)
   (b) Then you put back the ball and made a second try, and that was non-red again. Update the probability of the above hypothesis.
2. "The common symptom of this year's flu (H) is severe headache and dizziness (E). Suspect a flu if you have these symptoms."
   (a) Find the posterior probability of flu when $P(H) = 0.1, P(E|H) = 0.8, P(E) = 0.2$.
   (b) Find the posterior probability of flu when $P(H) = 0.1, P(E|H) = 0.8, P(E|\neg H) = 0.1$.
3. There are three boxes, A, B, C, only one of which contains a prize. Suppose you chose A. Then the bookmaker opens C, to show that it is empty. Now he asks: "you can change your mind and select B, if you like. Do you?" Should you switch, or stick to your original choice? Justify your answer.