Additional Homework Problems

Biostat 341

August 24, 2016

1 Lectures 1-2

1. Let $P(A) = 1/2, P(B) = 1/8$, and $P(C) = 1/4$, where A, B, and C are disjoint. Find the following:

   a $P(A \cup B \cup C)$.

   b $P(A^C \cap B^C \cap C^C)$.

2. If $P(A) = \frac{1}{4}$ and $P(B^C) = \frac{1}{5}$, can A and B be disjoint? Explain. Find conditions for $P(B^C)$ such that A and B can be disjoint.

3. Find an expression for $P(A \cup B \cup C)$ in terms of intersections similar to CB Theorem 1.2.9b.

4. Prove that $P[(A \cap B^C) \cup (A^C \cap B)] = P(A) + P(B) - 2P(A \cap B)$.

5. In the upcoming presidential election, assume that every voter has to either vote for Clinton or Trump (the ballot cannot be left blank and there are only two choices). Suppose 40% of Tennesseans vote for Clinton and further suppose that 30% of Tennesseans are African-American. What percentage of voters are African-Americans who voted for Trump?

6. Provide the sample space for the following sets of studies:

   a A survey is designed to estimate the number of indigo buntings in Edwin Warner Park in September.

   b A cancer patient's time from initiation of chemotherapy to relapse/death from cancer is assessed.

   c Three people are randomly selected and their blood type (A, B, AB, or O) is determined (order doesn't matter).

CB: 1.3c, 1.4, 1.6, 1.7, 1.8