Econ 241A Probability, Statistics and Econometrics
Fall 2017

Problem Set 1

1. The probability that it rains in city A is 0.5, the probability that it rains in city B is 0.3, and the probability that it rains in both is 0.15. Find the probability of each of these events:

   (a) It does not rain in either city.

   (b) It rains in both cities.

   (c) It rains in at least one city.

2. Consider two events A and B such that $P(A) = 1/5$ and $P(B) = 1/3$. Find $P(B \cap A^c)$ for each of these cases:

   (a) A and B are disjoint

   (b) $B \subset A$

   (c) $P(B \cap A) = 1/7$

3. Consider two events A and B with $P(A) = 0.4$ and $P(B) = 0.7$. Determine the minimum and maximum values of $P(A \cap B)$ and the conditions under which each is attained.

In addition, solve the following problems from Casella and Berger: 1.2, 1.6, 1.35, 1.39, 1.47 (c) and (d), 1.49, 1.51 and 1.54 (b).