

# STATS 205: Homework Assignment 5

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## Solution to Problem 1

We say that two observations  $X_1$  and  $X_2$  are *independent* of one another with respect to a collection of events  $\mathcal{A}$  if

$$Pr \{X_1 \in A \text{ and } X_2 \in B\} = Pr \{X_1 \in A\} Pr \{X_2 \in B\}$$

where A and B are any two not necessarily distinct sets of outcomes belonging to  $\mathcal{A}$ .

In deciding whether your own observations are exchangeable and a permutation test applicable, the key question is the one we posed in the very first chapter: Under the null hypothesis of no differences among the various experimental or survey groups, can we exchange the labels on the observations without significantly affecting the results?

- 2.2.2 Exchangeable Observations; Permutation, Parametric, and Bootstrap Tests of Hypotheses; Good, Phillip I