STA213 **Fall 1999**

Homework 1

Suggested problems :

p12 : 4, 7 p17 : 6 p20 : 4,5,6 p25 : 6
p31 : 9, 10, 11, 12, 13, 14, 16 p36 : 3, 4, 8 p42 : 7 p63 : 4, 5 p72 : 1, 2, 3, 7

Problems for grading :

1. A family has two children. What is the conditional probability that both are boys given that at least one of them is boy?

2. (The Priciple of Inclusion and Exclusion) Let $A_1, A_2, \cdots, A_n$ be events. Prove

$$\begin{aligned} P(\cup_{i=1}^n A_i) &= \sum_{i=1}^n P(A_i) - \sum_{i<j}^n P(A_i \cap A_j) \\ &+ \sum_{i<j<k}^n P(A_i \cap A_j \cap A_k) \\ &+ \cdots + (-1)^{n+1} P(\cap_{i=1}^n A_i). \end{aligned}$$

   Hint : Use induction.

3. Give an example of events that are pairwise independet but are not mutually independent.

4. Problem 10 in p72.

5. Problem 11 in p72.