

Statistics 110 – Assignment 1

Due: Wednesday, July 5, 2006

1. Rice 1.17 (Note that this means chapter 1, question 17 from Rice)
2. Rice 1.20
3. Rice 1.22
4. (a) Prove Boole's inequality (for $n = 2$):

$$P[A \cup B] \leq P[A] + P[B]$$

- (b) Use induction to generalize Boole's inequality to n events, i.e. show

$$P[A_1 \cup A_2 \cup \dots \cup A_n] \leq P[A_1] + P[A_2] + \dots + P[A_n]$$

5. Rice 1.50, 1.51
6. Rice 1.54
7. Rice 1.56
8. Rice 1.60
9. Rice 1.62
10. Rice 1.76
11. Rice 1.78
12. In any given year a male automobile policyholder will make a claim with probability p_m , and a female policyholder will make a claim with probability p_f , where $p_m \neq p_f$. The fraction of policyholders that are male is α , $0 < \alpha < 1$. A policyholder is chosen at random. If A_i denotes the event that this policyholder makes a claim in year i , show that

$$P[A_2|A_1] > P[A_1]$$