

Homework 1
36-325/725
due Friday Aug 31

(1) Chapter 1.4 Problem # 7. (Note that when you do this question, you are proving the assertion in the lecture notes about how to interpret “limsup A_n ” and “liminf A_n ”.

(2) Chapter 1.4 Problem # 4

(3) Let $S = \{0, 1, \dots\}$. Prove that there does not exist a uniform distribution on S .

(4) Let A_1, A_2, \dots be events. Show that

$$P(\cup_{n=1}^{\infty} A_n) \leq \sum_{n=1}^{\infty} P(A_n).$$

Hint: Define $B_n = A_n - \cup_{i=1}^{n-1} A_i$. Then show that the B_n are disjoint and that $\cup_{n=1}^{\infty} A_n = \cup_{n=1}^{\infty} B_n$.

(5) Suppose that $P(A_i) = 1$ for each i . Prove that

$$P(\cap_{i=1}^{\infty} A_i) = 1.$$

(Hint, use (2) and (4))

(6) Download R. Download the R tutorial from my web site. Follow the tutorial. Do not hand this question in.