Dr. Cristian Giardinà September 4, 2008

Stochastic Processes 2WB08: problem set 1

- Warnings:
  1. It is important to take notes because we do not always follow the book. We recommend to read the corresponding parts of the book as we proceed with the course.
  2. How to reach us:
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- First problem set
  1. Review conditional probability and conditional expectations [Ross, Section 1.5]. In particular, prove the properties of conditional expectation given in the lecture.
  2. Study Section 6.1 in Ross.
  3. Ross, problems 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 (some of these exercises were treated during the lesson, re-do them by yourself!)
  4. Problem: Let U_i, $i \geq 1$, be i.i.d. uniformly distributed on $(0,1)$, and set

$$X_n := \prod_{i=1}^{n} U_i \qquad \text{and} \qquad M_n := 2^n X_n$$

     for $n \geq 1$. Show that $(M_n)_{n\geq 1}$ is a martingale.