Probability Limit Theorem: Problem Set I

Youngduck Choi
CILVR Lab
Courant Institute of Mathematical Sciences
New York University
yc1104@nyu.edu

Abstract

This work contains a collection of solutions for selected problems of the Lecture I of Probability Limit Theorem I of Fall 2015.

Question 1.dd.

Solution. Let $(\Omega, \mathbb{F}, \mathbb{P})$ be a probability space.

Question 2-(i). σ-field.

Solution. Let $\{\mathbb{G}_\lambda\}_{\lambda\in\Lambda}$ be a collection of σ-fields of the space Ω. We wish to show that $\cap_{\lambda\in\Lambda}\mathbb{G}_\lambda$ is a σ-field of Ω. As $\emptyset, \Omega \in \mathbb{G}$ for all $\lambda \in \Lambda$, we have that

$$\emptyset, \ \ \Omega \in \cap_{\lambda\in\Lambda}\mathbb{G}_\lambda,$$

thereby satisfying one basic property of σ-field. It remains to show that a union of countable collection of subsets in

Question 4.

Solution.