Week 5-6 Study Guide

Botao Jin

University of California, Santa Barbara — February 1, 2025

Random Variables

1. Discrete random variables: $3.5, 2.38$
2. Continuous random variables: $3.7, 3.25$

Distributions for Discrete Random Variables

1. Binomial distribution: $2.21, 2.62$
2. Geometric distribution: $2.20, 2.22$
3. Negative binomial distribution: Example 7.7
4. Hyper-geometric distribution: $2.24, 2.28$
5. Poisson distribution: $4.10, 4.33, 4.34$

   Remark. The mean of Poisson random variable is the parameter λ.

Distributions for Continuous Random Variables

1. Uniform distribution: $1.9, 1.11, 3.4, 3.20, 3.41$
2. Exponential distribution: $4.13, 4.14$

   Hint for exercise 4.14: Expected lifetime is 1000 days implies that the lifetime is exponential distributed with parameter $\lambda = \frac{1}{1000}$.
3. Normal distribution: $3.17, 3.18a, 3.18b$

Note: This study guide is used for Botao Jin's sections only. Comments, bug reports: b_jin@ucsb.edu