

MA204: Mathematical Statistics

Assignment 3

Part I (**Weights 4%**):

Submit your solutions for 9 questions randomly selected from Q3.1 ~ Q3.16 on pages 155–159 of Lecture Notes <<Mathematical Statistics>>, plus the following question

Q3.17 Suppose that X follows a geometric distribution,

$$\Pr(X = k) = p(1 - p)^{k-1}, \quad k = 1, 2, \dots$$

where $0 \leq p \leq 1$, and assume an i.i.d. sample of size n .

- (a) Find the moment estimator of p .
- (b) Find the MLE of p .
- (c) Let p have a uniform prior distribution on $[0, 1]$. What is the posterior distribution of p ? What is the posterior mean?

Part II (Weights 1%):

Please find one question (denoted by Q3.18) from any textbooks of mathematical statistics (in English) satisfying the following conditions

- 1. The content of your Q3.18 must belong to Chapter 3 of Lecture Notes <<Mathematical Statistics>>.**
- 2. 请标明你的 Q3.18 是来自哪一本书的哪一页, for example:**

Miller, I. and Miller, M. (2004). John E. Freund's Mathematical Statistics with Applications (7-th Edition). Prentice-Hall, New Jersey, Pages 6-7.

- 3. 你可以从任何中文的数理统计书中找一个题目及答案, 但要翻译成为英文.**
- 4. 你的 Q3.18 既要不同于本教科书中的任何 Examples, Exercises, 也要不同于 Tutorial 中的任何 Examples 以及本课 QQ 群中所给的 100 Problems.**
- 5. Please submit the question Q3.18 itself with your solution.**
- 6. 鼓励用 Word 或 Latex 编辑**
- 7. Q3.18 and its solution should be submitted to 徐彬同学.**