MA204: Mathematical Statistics
Assignment 4

Part I (Weights 4%):

Submit your solutions for Q4.1 ~ Q4.6 on pages 179—180 of Lecture Notes <<Mathematical Statistics>>, plus the following question

Q4.7 A theoretical model suggests that the time to breakdown of an insulating fluid between electrodes at a particular voltage has an exponential distribution with parameter λ. A random sample of $n = 10$ breakdown times yields the following sample data (in min): $x_1 = 41.53$, $x_2 = 18.73$, $x_3 = 2.99$, $x_4 = 30.34$, $x_5 = 12.33$, $x_6 = 117.52$, $x_7 = 73.02$, $x_8 = 223.63$, $x_9 = 4.00$, $x_{10} = 26.78$. Let $\alpha = 0.05$, $\chi^2\left(\frac{\alpha}{2}, 2n\right) = 34.170$ and $\chi^2\left(1-\frac{\alpha}{2}, 2n\right) = 9.591$.

(a) Find an exact 95% equal-tail CI for λ.

(b) Find an exact 95% equal-tail CI for $1/\lambda$.

Part II (Weights 1%):

Please find one question (denoted by Q4.8) from any textbooks of mathematical statistics (in English) satisfying the following conditions

1. **The content of your Q4.8 must belong to Chapter 4 of Lecture Notes <<Mathematical Statistics>>.**
2. **请标明你的 Q4.8 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 Q4.8 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 Q4.8 itself with your solution.**
6. **鼓励用 Word 或 Latex 编辑**
7. **Q4.8 and its solution should be submitted to 徐彬同学.**