北京理工大學
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1. 极大似然估计.

(1). $\hat{\theta} = -\frac{n}{\sum_{i=1}^{n}\ln x_i} - 1$

(2). $\hat{\mu} = \frac{1}{n}\sum_{i=1}^{n}\ln X_i$

$\hat{\sigma}^2 = \frac{1}{n}\sum_{i=1}^{n}\left(\ln X_i - \frac{1}{n}\sum_{i=1}^{n}\ln X_i\right)^2$

(3). $\hat{\lambda} = \frac{1}{\bar{X}}$

(4). $\hat{\mu} = \min(X_1, \ldots, X_n)$

$\hat{\lambda} = \frac{1}{\bar{X} - \min(X_1, \ldots, X_n)}$

(5) $\hat{\theta}$ 取 $[X_n - 0.5, X_n + 0.5]$ 任意值

4. (1). $\hat{\lambda} = \bar{X}$

(2). $\hat{\sigma}^2 = \frac{1}{n}\sum_{i=1}^{n}(X_i - \mu)^2$

7. $\hat{\mu} = 15000$

8.

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9. $ET = \frac{2}{n(n+1)}\sum E(iX_i)$

$= \mu.$

$DT = \frac{2}{3}\frac{2n+1}{n(n+1)}\sigma^2$

$\lim_{n\to\infty} 1 = \lim_{n\to\infty}\left[1-\frac{2(2n+1)\sigma^2}{3n(n+1)\varepsilon^2}\right]=1$

10. μ_2 更有效

11. $\hat{\theta}_1$ 更有效

13. (1). [5.608, 6.392]

(2). [5.558, 6.442]

14. μ [1485.69, 1514.31].

σ^2 为 [189.24, 1333.23]

17. 11

19. [-0.002, 0.006]

20. [0.2810, 2.8413]

余峰 余炀

$P_{H_0}(\bar{X} \geq 0.98) = 1 - \phi\left(\frac{0.98-0}{\sqrt{4}}\right) = 0.0250.$

6\. (1) $P(一) = 0.025$、 $P_{H_1}(\bar{X} < 0.98) = \phi\left(\frac{0.98-1}{\sqrt{4}}\right) = 0.4840$

$P(二) = 0.484$.

(2) $n = 6$.

7\. $P(一) = \frac{1}{3}$ $P_{I} = P(X > \frac{2}{3} | H_0成立) = \int_{\frac{2}{3}}^{1} 1dx = \frac{1}{3}$

$P(二) = \frac{4}{9}$ $P_{II} = P(X \leq \frac{2}{3} | H_1成立) = \int_{0}^{\frac{2}{3}} 2xdx = \frac{4}{9}$