Lesson 4

测验, 6 个问题

6/6 分 (100%)

✔ 恭喜！您通过了！

下一项

✔ 1 / 1 分

1。

For Questions 1-3, consider the following scenario:

In the example from Lesson 4.1 of flipping a coin 100 times, suppose instead that you observe 47 heads and 53 tails.

- Report the value of $\hat{p}$, the MLE (Maximum Likelihood Estimate) of the probability of obtaining heads.

0.47

正确回答

This is simply 47/100, the number of successes divided by the number of trials.

✔ 1 / 1 分

2。

Coin flip:

Using the central limit theorem as an approximation, and following the example of Lesson 4.1, construct a 95% confidence interval for p , the probability of obtaining heads.

- Report the lower end of this interval and round your answer to two decimal places.

0.37

正确回答

We have
$\hat{p} - 1.96\sqrt{\hat{p}(1-\hat{p})/n} = .47 - 1.96\sqrt{(.47)(.53)/100} = .372$
, which is the lower end of a 95% confidence interval for p .

---

1 / 1 分

3。
Coin flip:

- Report the upper end of this interval and round your answer to two decimal places.

0.57

正确回答

We have
$\hat{p} + 1.96\sqrt{\hat{p}(1-\hat{p})/n} = .47 + 1.96\sqrt{(.47)(.53)/100} = .568$
, which is the upper end of a 95% confidence interval for p
.

---

1 / 1 分

4。
The likelihood function for parameter θ with data $\mathbf{y}$ is based on which of the following?

- $P(\theta \mid \mathbf{y})$
- $P(\mathbf{y} \mid \theta)$

正确

The likelihood is based on the sampling distribution of the data, given the parameter. Note that although the likelihood has the same functional form as $P(\mathbf{y} \mid \theta)$, it is considered a function of θ .

- $P(\theta)$
- $P(\mathbf{y})$
- None of the above.

1 / 1 分

5。

Recall from Lesson 4.4 that if $X_1, \ldots, X_n \overset{\text{iid}}{\sim} \text{Exponential}(\lambda)$ (iid means independent and identically distributed), then the MLE for λ is $1/\bar{x}$ where $\bar{x}$ is the sample mean. Suppose we observe the following data:
$X_1 = 2.0,\ X_2 = 2.5,\ X_3 = 4.1,\ X_4 = 1.8,\ X_5 = 4.0$.

Calculate the MLE for λ . Round your answer to two decimal places.

0.35

正确回答

The sample mean is $\bar{x} = 2.88$.

1 / 1 分

Lesson 4

测验, 6 个问题

6/6 分 (100%)

6。

It turns out that the sample mean $\bar{x}$ is involved in the MLE calculation for several models. In fact, if the data are independent and identically distributed from a Bernoulli(p), Poisson(λ), or Normal(μ, σ^2), then $\bar{x}$ is the MLE for p, λ, and μ respectively.

Suppose we observe $n = 4$ data points from a normal distribution with unknown mean μ. The data are $\mathbf{x} = \{-1.2, 0.5, 0.8, -0.3\}$.

What is the MLE for μ? Round your answer to two decimal places.

-0.05

正确回答

This is $(-1.2 + 0.5 + 0.8 - 0.3)/4$.