Module 2 Honors

测验, 4 个问题

4/4 分 (100%)

恭喜！您通过了！

下一项

1 / 1 分

1。

Although the likelihood function is not always a product of $f(y_i|\theta)$ for $i = 1, 2, \ldots, n$, this product form is convenient mathematically. What assumption about the observations y allows us to multiply their individual likelihood components?

independent

正确回答

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1 / 1 分

2。

One nice property of MLEs is that they are transformation invariant. That is, if $\hat{\theta}$ is the MLE for θ , then the MLE for $g(\theta)$ is $g(\hat{\theta})$ for any function $g(\cdot)$.

- Suppose you conduct 25 Bernoulli trials and observe 10 successes. What is the MLE for the odds of success? Round your answer to two decimal places.

0.67

正确回答

This is $\hat{p}/(1 - \hat{p})$ where $\hat{p} = 10/25$. It is the ratio of successes to failures.

1 / 1 分

3。

For Questions 3-4, recall the scenario from Lesson 5 in which your brother brings you a coin which may be fair (probability of heads 0.5) or loaded (probability of heads 0.7).

Another sibling wants to place bets on whether the coin is loaded. If the coin is actually loaded, she will pay you \$1. If it is not loaded, you will pay her $\$z$.

- Using your prior probability of 0.6 that the coin is loaded and assuming a fair game, determine the amount z that would make the bet fair (with prior expectation \$0). Round your answer to one decimal place.

1.5

正确回答

Your prior expected payoff is

$1 \cdot P(\text{loaded}) - z \cdot P(\text{not loaded}) = 1(.6) - z(.4)$.

Setting this equal to 0 yields the answer.

1 / 1 分

4。

Before taking the bet, you agree to flip the coin once. It lands heads. Your sister argues that this is evidence for the loaded coin (in which case she pays you \$1) and demands you increase z to 2.

- Should you accept this new bet? Base your answer on your updated (posterior) probability that the coin is loaded.

- [ ] Yes, your posterior expected payoff is now less than \$0.
- [x] Yes, your posterior expected payoff is now greater than \$0.

正确

The posterior probability that the coin is loaded is $\frac{.7(.6)}{.7(.6)+.5(.4)} \approx 0.677$. Thus your posterior expected payoff is $1 \cdot (.677) - 2 \cdot (.323) \approx 0.03 > 0$. This game is in your favor because your sister did not adjust z enough. The fair amount would have been $z = 2.1$.

- ○ No, your posterior expected payoff is now less than $0.
- ○ No, your posterior expected payoff is now greater than $0.