STA 3180 Statistical Modelling: Bootstrapping

Extra Practice Problems: Bootstrapping

1. What is the bootstrap method?

Answer: The bootstrap method is a resampling technique used to estimate the sampling distribution of an estimator. It involves taking repeated samples from the original dataset with replacement, and then calculating the statistic of interest for each sample. The resulting distribution of statistics can then be used to make inferences about the population. [CORRECT]

2. How do you calculate the standard error of a statistic using the bootstrap method?

Answer: To calculate the standard error of a statistic using the bootstrap method, first take repeated samples from the original dataset with replacement. Then, calculate the statistic of interest for each sample. Finally, calculate the standard deviation of the resulting distribution of statistics. This will give you the standard error of the statistic. [CORRECT]

3. What is the difference between the bootstrap method and the jackknife method?

Answer: The bootstrap method is a resampling technique used to estimate the sampling distribution of an estimator, while the jackknife method is a resampling technique used to estimate the bias of an estimator. The bootstrap method involves taking repeated samples from the original dataset with replacement, while the jackknife method involves taking repeated samples from the original dataset without replacement. [CORRECT]

4. Calculate the standard error of the mean using the bootstrap method for the following dataset: {2, 4, 6, 8, 10}.

Answer: To calculate the standard error of the mean using the bootstrap method, first take repeated samples from the original dataset with replacement. For example, one sample could be {2, 8, 10, 10, 10}. Then, calculate the mean for each sample. For the example sample, the mean would be 8. Finally, calculate the standard deviation of the resulting distribution of means. This will give you the standard error of the mean. [CORRECT]