STA 3180 Statistical Modelling: Robust Statistics

Extra Practice Problems: Robust Statistics

1. Explain how to calculate the median absolute deviation (MAD) of a set of data.

Solution: To calculate the median absolute deviation (MAD) of a set of data, first calculate the median of the data set. Then, for each data point, calculate the absolute value of the difference between the data point and the median. Finally, calculate the median of these absolute differences. This is the MAD of the data set. [CORRECT]

2. Calculate the MAD of the following data set: 2, 4, 6, 8, 10

Solution: First, calculate the median of the data set. The median is 6. Then, calculate the absolute value of the difference between each data point and the median. This gives us the following absolute differences: 4, 2, 0, 2, 4. The median of these absolute differences is 2, so the MAD of the data set is 2. [CORRECT]

3. Calculate the MAD of the following data set: 1, 3, 5, 7, 9

Solution: First, calculate the median of the data set. The median is 5. Then, calculate the absolute value of the difference between each data point and the median. This gives us the following absolute differences: 4, 2, 0, 2, 4. The median of these absolute differences is 2, so the MAD of the data set is 2. [CORRECT]

4. Calculate the MAD of the following data set: 1, 2, 3, 4, 5

Solution: First, calculate the median of the data set. The median is 3. Then, calculate the absolute value of the difference between each data point and the median. This gives us the following absolute differences: 2, 1, 0, 1, 2. The median of these absolute differences is 1, so the MAD of the data set is 1. [CORRECT]

5. Calculate the MAD of the following data set: 1, 2, 3, 4, 5, 6

Solution: First, calculate the median of the data set. The median is 3.5. Then, calculate the absolute value of the difference between each data point and the median. This gives us the following absolute differences: 1.5, 0.5, 0.5, 1.5, 2.5, 2.5. The median of these absolute differences is 1.5, so the MAD of the data set is 1.5. [CORRECT]