Interquartile Range (IQR) Calculation and Outlier Detection

Day Data

- **Minimum**: 32
- **Q1**: 56
- **Median**: 74.5
- **Q3**: 82.5
- **Maximum**: 99

Night Data

- **Minimum**: 25.5
- **Q1**: 78
- **Median**: 81
- **Q3**: 89
- **Maximum**: 98

Step 1: Calculate IQR for Day and Night

Day IQR

IQR_Day = Q3_Day - Q1_Day IQR_Day = 82.5 - 56 = 26.5

Night IQR

IQR_Night = Q3_Night - Q1_Night IQR_Night = 89 - 78 = 11

Step 2: Compare the IQRs

- The IQR for the Day data is 26.5
- The IQR for the Night data is 11

Comparison:

- The IQR for Day data (26.5) is significantly larger than the IQR for Night data (11). This indicates that the daytime temperatures have a wider spread or more variability compared to the nighttime temperatures.

Step 3: Identify Outliers

Day Outliers

Using the 1.5 * IQR rule: Lower Bound_Day = Q1_Day - 1.5 * IQR_Day Lower Bound_Day = 56 - 1.5 * 26.5 = 56 - 39.75 = 16.25

Upper Bound_Day = Q3_Day + 1.5 * IQR_Day Upper Bound_Day = 82.5 + 1.5 * 26.5 = 82.5 + 39.75 = 122.25

Outliers in Day Data:

- Any data points below 16.25 or above 122.25 are considered outliers.
- Given the range of the data (32 to 99), there are no outliers in the Day data.

Night Outliers

Using the 1.5 * IQR rule: Lower Bound_Night = Q1_Night - 1.5 * IQR_Night Lower Bound_Night = 78 - 1.5 * 11 = 78 - 16.5 = 61.5

Upper Bound_Night = Q3_Night + 1.5 * IQR_Night Upper Bound_Night = 89 + 1.5 * 11 = 89 + 16.5 = 105.5

Outliers in Night Data:

- Any data points below 61.5 or above 105.5 are considered outliers.
- Given the range of the data (25.5 to 98), the data point 25.5 is an outlier in the Night data.

Summary

- **Day Data**:
  - **IQR**: 26.5
  - **Outliers**: None
- **Night Data**:
  - **IQR**: 11
  - **Outliers**: 25.5

Conclusion: The daytime temperatures have greater variability compared to nighttime temperatures. There are no outliers in the Day data, while the Night data has one outlier (25.5).