

Inter Quartile Range (IQR)

a. The interquartile range. Compare the two interquartile ranges.

b. Any outliers in either set.

The five number summary for the day and night classes is

	Minimum	Q_1	Median	Q_3	Maximum
Day	32	56	74.5	82.5	99
Night	25.5	78	81	89	98

IQR for day time = $Q_3 - Q_1$

IQR for day time = $(82.5 - 56)$

IQR for day time = 26.5

Lower IQR for day time = $Q_1 - (1.5 * \text{IQR})$

Lower IQR for day time = $56 - (1.5 * 26.5)$

Lower IQR for day time = 16.25

Higher IQR for day time = $Q_3 + (1.5 * \text{IQR})$

Higher IQR for day time = $82.5 + (1.5 * 26.5)$

Higher IQR for day time = 122.25

From the problem, min value in the day = 32 and max value in the day = 99

Here min value > lower IQR and max value < higher IQR.

So, there is no outlier is present in the dataset for day classes

IQR for night time = $Q_3 - Q_1$

IQR for night time = $(89 - 78)$

IQR for night time = 11

Lower IQR for night time = $Q_1 - (1.5 * \text{IQR})$

Lower IQR for night time= $78-(1.5 * 11)$

Lower IQR for night time=61.5

Higher IQR for night time= $Q3+(1.5 * IQR)$

Higher IQR for night time= $89+(1.5 * 11)$

Higher IQR for night time=105.5

From the problem, min value in the day =25.5 and max value in the day =98

Here min value< lower IQR and max value<higher IQR.

So, there is outlier is present in the LOWER side of the dataset for night classes and that is replace by 61.5 which is the Lower IQR value