Identifying Outliers

Task

Students were asked to report how far (in miles) they each live from school. The following distances were recorded.

	Student	Distance
1	Zane	0.4
2	Jackson	0.5
3	Benjamin	1.0
4	Bethany	1.0
5	Joe	2.4
6	Noelle	2.7
7	Tianye	3.0
8	Anthony	3.2
9	Amanda	4.1
10	Michaela	4.2
11	Miranda	4.4

12	Joseph	5.0
13	John	7.5

1. Summary statistics for the distances are given below.

Min	Q1	Median	Q3	Max	Mean
0.4	1.0	3.0	4.3	7.5	3.03

Construct a box plot for the distances and describe the main features of the distribution.

2. John currently lives furthest from school. Would you consider his distance from school (7.5 miles) to be ”unusual"? Explain.

3. John’s family is considering moving to a house that is 10 miles from school. How will this move affect the summary statistics? Change John’s distance from 7.5 miles to 10 miles and complete the table based on this new data.

Min	Q1	Median	Q3	Max	Mean

Has the mean increased, decreased or remained unchanged? Has the median increased, decreased or remained unchanged? Explain how John’s move has affected these measures of center.

4. Construct a boxplot of the distances after John's move. Would you consider John's new distance from school (10 miles) to be "unusual" now? Explain.

5. A data point can be considered an “outlier” if it is more than 1.5 times the IQR above Q3 or more than 1.5 times the IQR below Q1. Using this description of an outlier, was John’s distance from school considered an outlier before the move? How about after the move? Support your answer with appropriate work.

6. Zane lives closest to school. Using the description of an outlier given in question 5, is his distance considered an outlier?

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