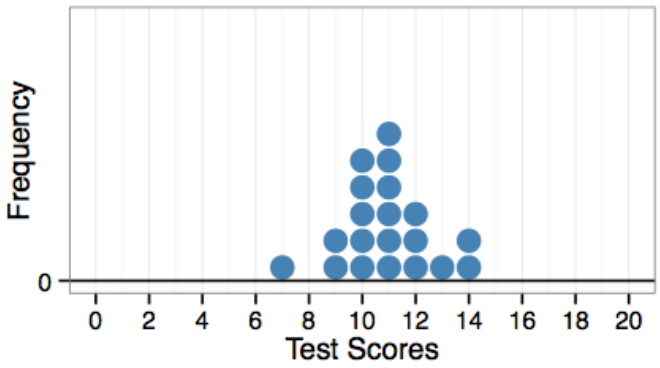
Name:_____ Date:_____

From Dotplots to Boxplots

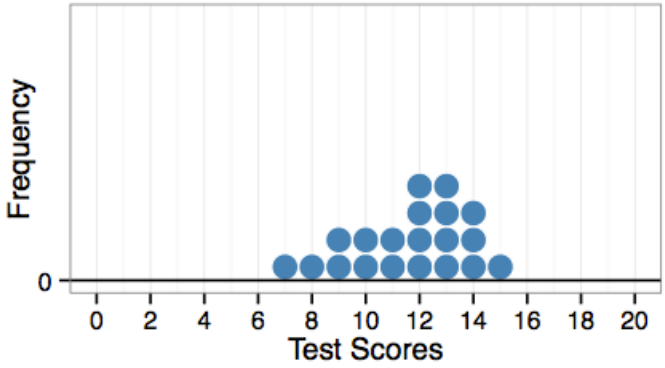
Background:

The dotplots below show the test scores data for two classes.

Class A



Class B



Instructions:

Create a boxplot of the data for each class. Use what you have learned about the components of a boxplot to sketch them using the data from the dotplots. Then compare the two boxplots and answer the questions that follow. Use evidence from the data to support your answers.

1. Draw boxplots for each class's distribution of test scores. Label all parts using values from the 5-number summaries.

Class A **Class B**

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2. Using only your boxplots, in which class did the middle 50% of the students do better? Include appropriate calculations, if necessary.

   Calculations:

   Answer:

3. Using only your boxplots, in which class did the top 25% of students do better? Include appropriate calculations, if necessary.

   Calculations:

   Answer:

4. Using only your boxplots, if you had to score in the bottom 25th percentile of students, which class would you rather be in? Explain your reasoning. How would your answer change if you used the dotplots?

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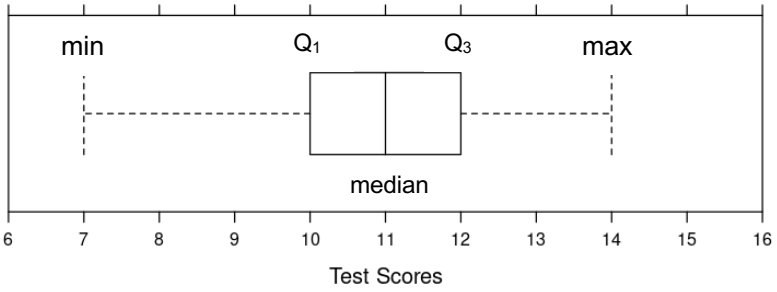
From Dotplots to Boxplots

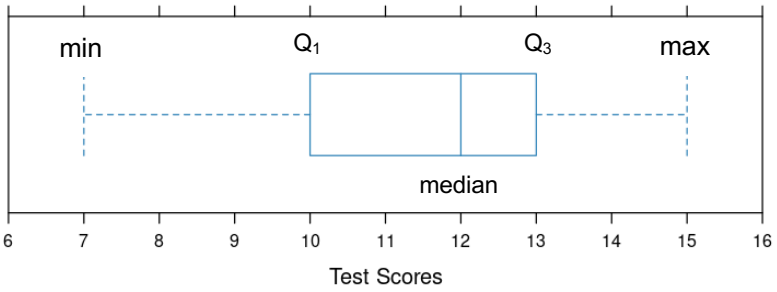
SOLUTION:

1. Draw boxplots for each class's distribution of test scores. Label all parts using values from the 5-number summaries.

Class A



Class B



2. Using only your boxplots, in which class did the middle 50% of the students do better? Include appropriate calculations, if necessary.

   Calculations: **Students should have already calculated the middle 50% (Q_1 to Q_3) for their boxplots.**

   Answer: **The middle 50% of students in Class B performed better since their median score was 12 compared to Class A's median score of 11.**

3. Using only your boxplots, in which class did the top 25% of students do better? Include appropriate calculations, if necessary.

   Calculations: **Students should have already calculated the top 25% (Q_3 to max) for their boxplots.**

   Answer: **The top 25% of students performed better in Class B. Their scores ranged from 13 to 15 while the top 25% in Class A scored 12 to 14.**

4. Using only your boxplots, if you had to score in the bottom 25th percentile of students, which class would you rather be in? Explain your reasoning. How would your answer change if you used the dotplots?

   Answers will vary. A possible answer might be: Using only the boxplots, the bottom 25% are indistinguishable (both range from 7 to 10). If we assume that the class is graded on a curve, then one might choose Class A, because the median, Q_3, and max are all lower than Class B, meaning that you'd score higher relative to the curve from Class A.

   If we had dotplots, in addition to boxplots, we could directly compare the bottom 25% (which are A: (7, 9, 9, 10, 10) and B: (7, 8, 9, 9, 10)). We might conclude that Class A is preferable because the ranked values of Class A are all greater than or equal to the corresponding ranked values of Class B within the bottom 25%.