Learning Objective: Use the concept of average deviation from the mean to estimate standard deviation from the mean.

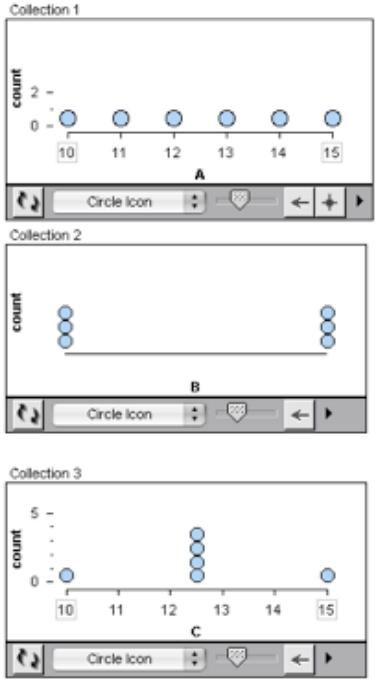
Statisticians invented **standard deviation** to measure variability about the mean. ***The standard deviation is roughly the average distance that the data points vary from the mean.*** In this activity we will use average distance from the mean (ADM) to estimate standard deviation (SD) about the mean. Later we will learn how to calculate SD.

1) Each dot plot shown varies from 10 to 15 with a mean of 12.5.

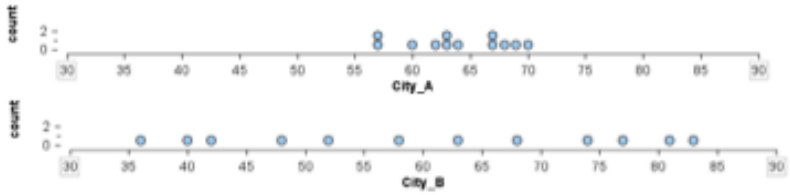
   a) Which dot plot has the least variability about the mean?

   b) Which has the most variability about the mean?

   c) Estimate the standard deviation from the mean (SD) by calculating the average deviation from the mean (ADM) for each set of data. Check to see if calculations agree with your answers above.

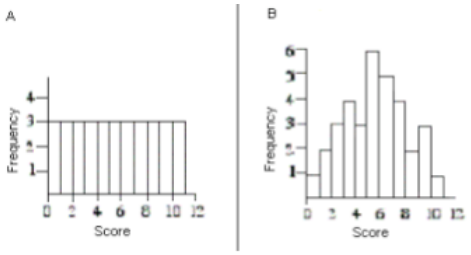


2) If we calculate the ADM for City A and City B using the average high temperatures, we get 3.6 and 14.2. Which is the ADM for San Francisco? How do you know? (See if you can answer this without doing any calculations!)



3) Which set of data will have a larger ADM? Why do you think so?
   - The ages of children at a local elementary school
   - The ages of people living in Pittsburg

4) Which distribution has the larger ADM? Explain how you made your decision.



5) Make up two data sets with the same mean but different ADM. Jot down a few notes about how you figured this out.

6) Make up two data sets with different means but the same ADM. Jot down a few notes about how you figured this out.

7) Make up two data sets so that one set of data has both a larger range and a smaller ADM compared to the other data set. Jot down a few notes about how you figured this out.