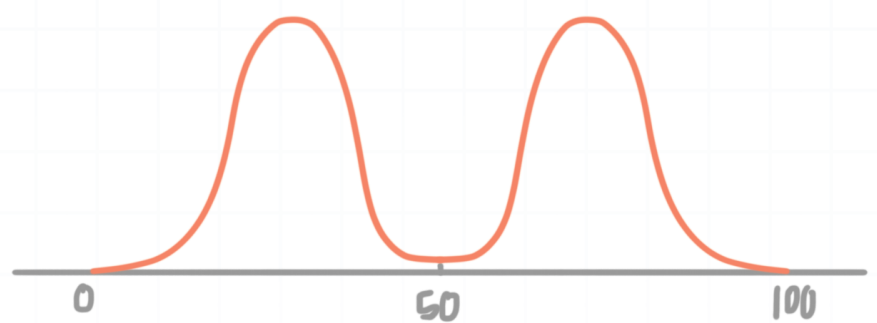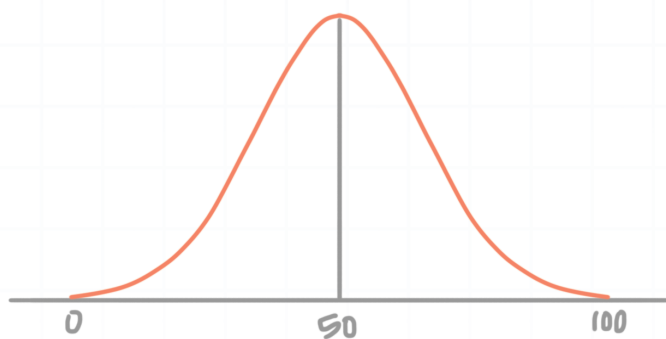**Topic**: Symmetric and skewed distributions and outliers

Question: Which of the statements are true about the given distributions?

I. Both distributions have the same mean.

II. Both distributions have the same range.
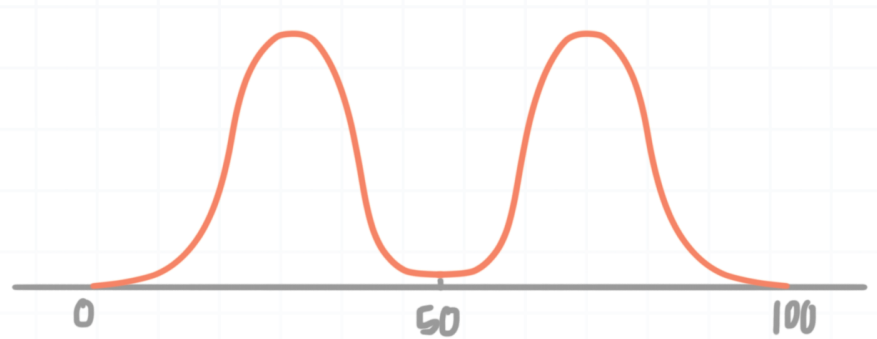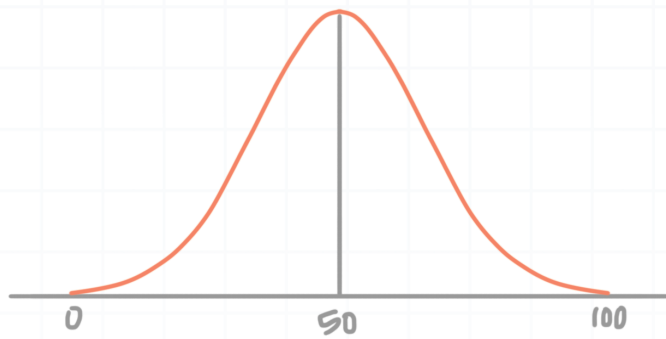
III. Both distributions have the same standard deviation.

Answer choices:

A   I only

B   I and II

C   I and III

D   I, II, and III

Solution: B

Both distributions are symmetric, so the mean and median are both in the middle. The mean of both distributions is 50. The range is the largest number in the data set, minus the smallest number. Both of these distributions have a range of $100 - 0 - 100$.

The standard deviation measures the spread of the data set. These data sets are spread out in different ways so their standard deviations will be different.

Topic: Symmetric and skewed distributions and outliers

Question: Which of the following statements are true?

      I. A right skewed distribution has a mean that's greater than the median.

      II. A symmetric distribution is always normal distributed.

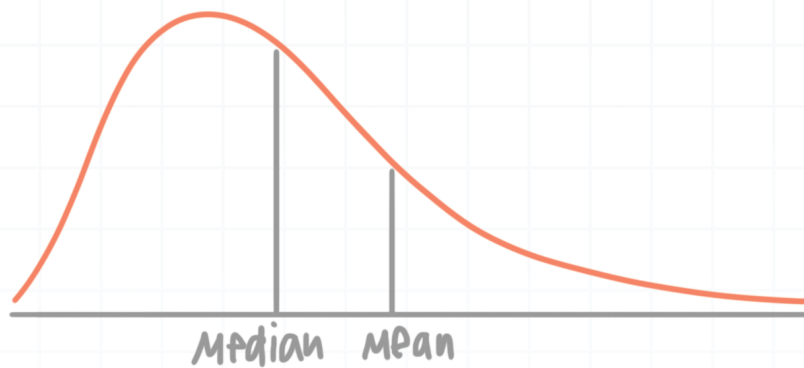   III. The only reason for a distribution to have a tail is if it has an outlier.

Answer choices:

A   I only

B   I and II

C   I and III

D   I, II, and III

Solution: A

The first statement is true. A right-skewed distribution has a tail on the right. The mean is further to the right than the median.

Median   Mean

The second statement is false. Symmetric distributions are not always normal distributions. Both of these are examples of symmetric distributions but the one on the left is a normal distribution and the one on the right is a bimodal distribution.
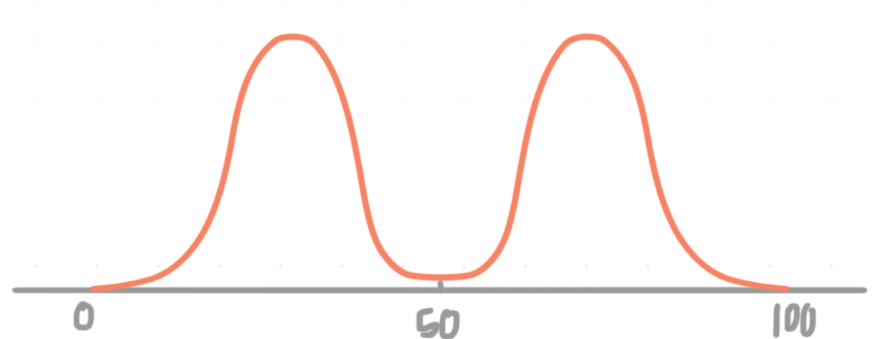

The third statement is false. An outlier could cause a tail in a data set, but some distributions naturally taper off to one side or another, not necessarily because of an outlier.

**Topic**: Symmetric and skewed distributions and outliers

Question: A pet store conducted a survey to determine how much money its customers spent on taking care of reptiles and fish. The amount of money the customers spent on reptiles is symmetrically distributed, but the amount spent on fish has a mean that's less than the median. Which set of distributions could match the descriptions?

Answer choices:

A

Reptiles

Fish

B

Reptiles

Fish

C

Reptiles

Fish

D
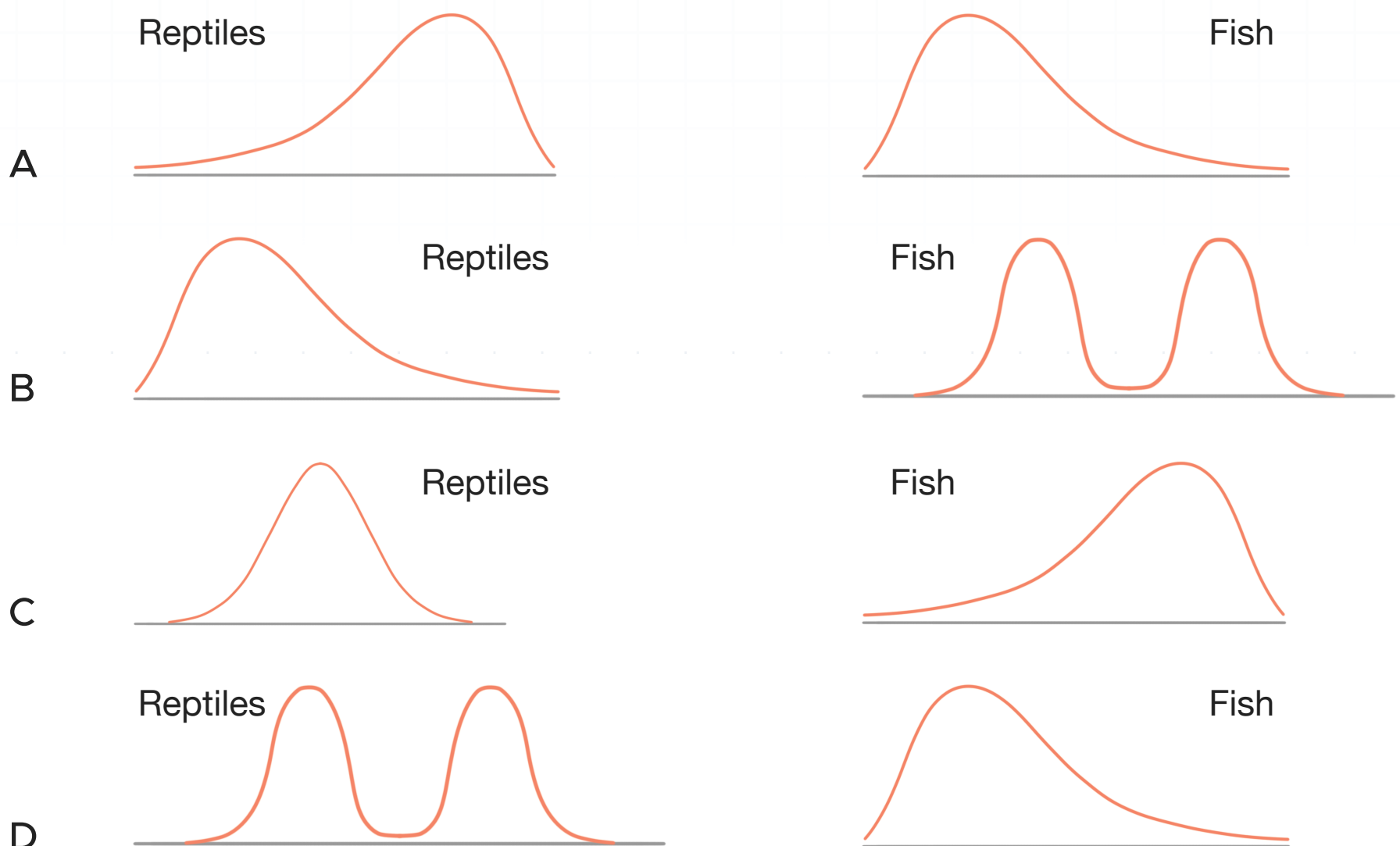
Reptiles

Fish

Solution: C

In answer choice C, the distribution for reptiles is a normal distribution, which is one type of symmetric distribution.
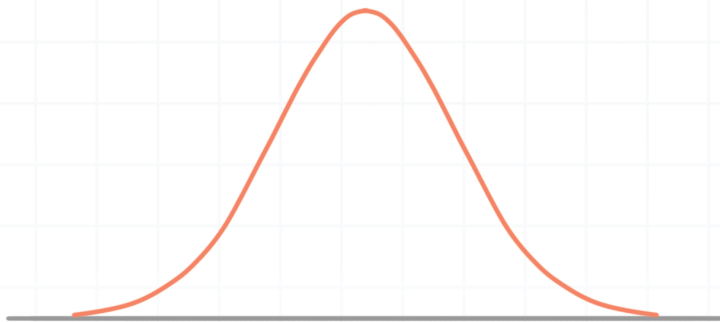
The distribution for fish is a left-skewed distribution, also called a negatively skewed distribution. The tail is on the left and the mean is less than the median.