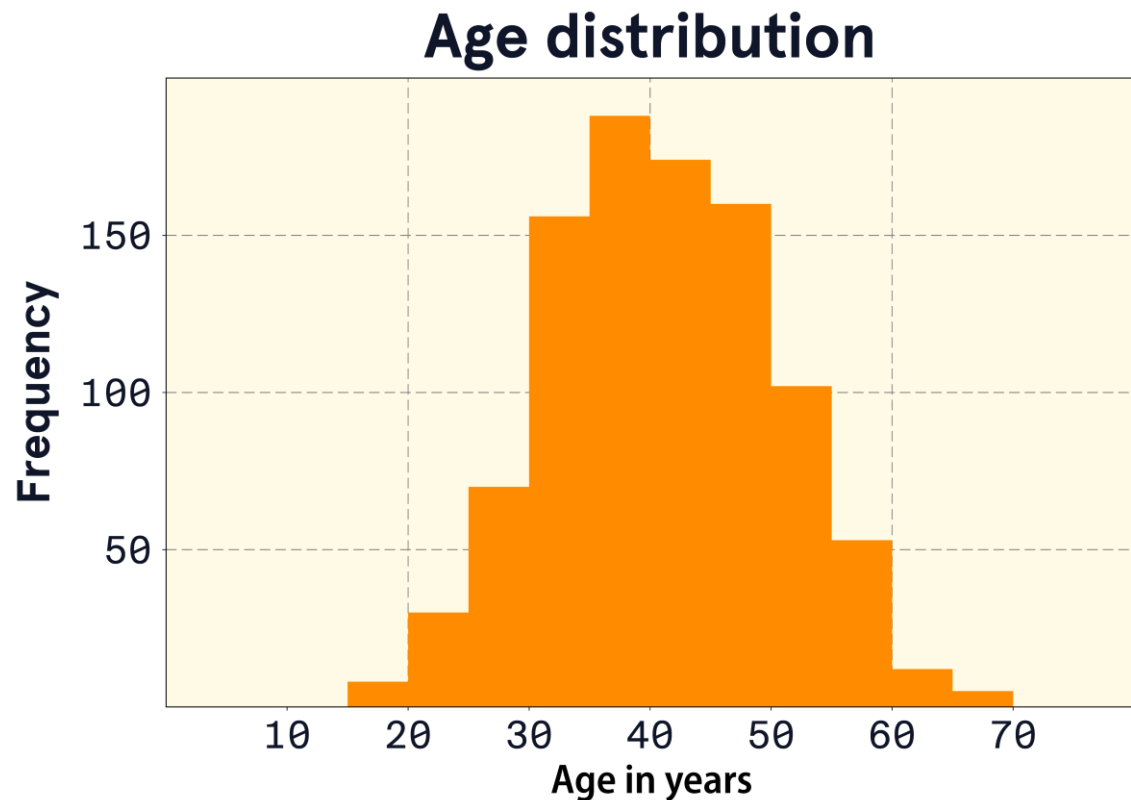


Mean and Standard Deviation

3 min

Let's return to our visualization of the distribution of musician ages.



- What would you say is the typical age of a musician in Melody Metropolis?
- Are most musicians about this age, or are there lots of musicians of many different ages?

To answer these questions more specifically, we should take some measurements of our variable.

- The **mean**, also called the average, describes the center of a numeric distribution by adding all values and dividing by the count.
- The **standard deviation** describes the spread of values in a numeric distribution relative to the mean. It is calculated by finding the average squared distance from each data point to the mean and square-rooting the result.

The mean age of musicians is 40.6 years and the standard deviation is about 9.3 years. We might interpret this standard deviation as moderate variability in age. Had the standard deviation been 1 year, we might say there's hardly any variability in age. The plot of this narrow distribution might look something like the following:

The mean and standard deviation are common choices, especially for normal distributions. Their mathematical formulas have special properties that make them easy to use in other contexts, such as statistical testing. However, the mean and standard deviation are not always the best measurements to describe a distribution.

Instructions

In the learning environment, you'll find an interactive plot of a normal distribution. You can change the mean and standard deviation of the distribution by moving the sliders.

Try moving the slider for the mean to create a new distribution with a different mean but the same standard deviation.

Now try moving the slider for the standard deviation to create a new distribution with the same mean but a different standard deviation.

For each change, ask yourself:

1. Is the new distribution in the same place on the x-axis?
2. Does the new distribution have approximately the same shape?

