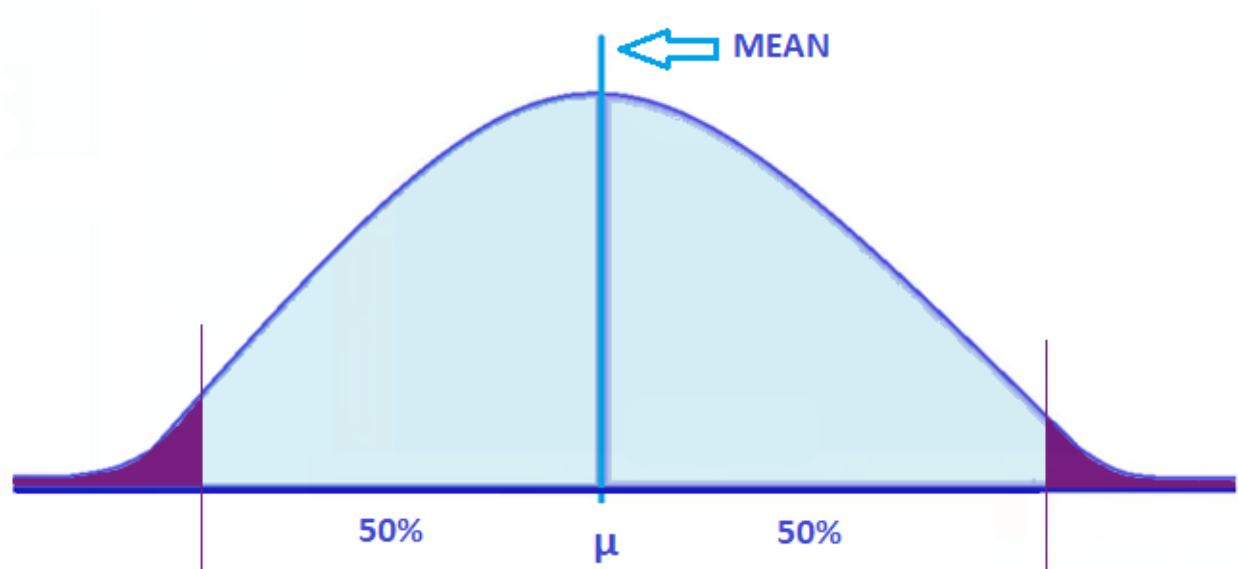


Elements of Normal Distribution:

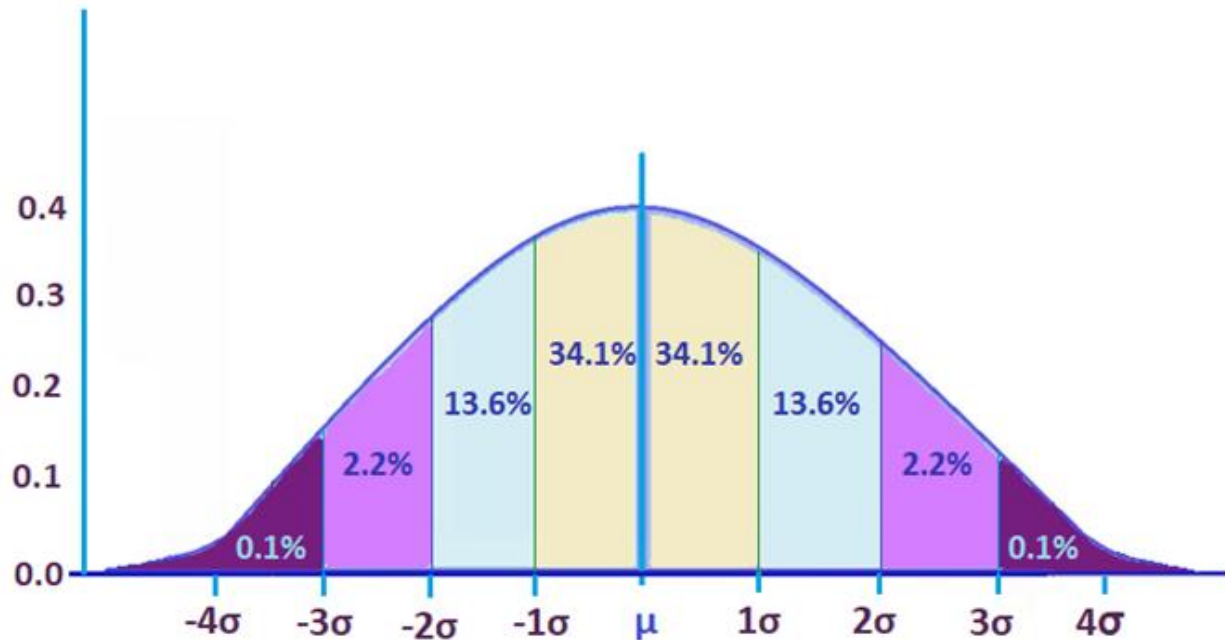
- Has a mean, median, or mode. A mean is the average of numbers in a group, a median is the middle number in a list of numbers, and a mode is a number that appears most often in a set of numbers.
- 50% of the values are less than the mean
- 50% of the values are greater than the mean



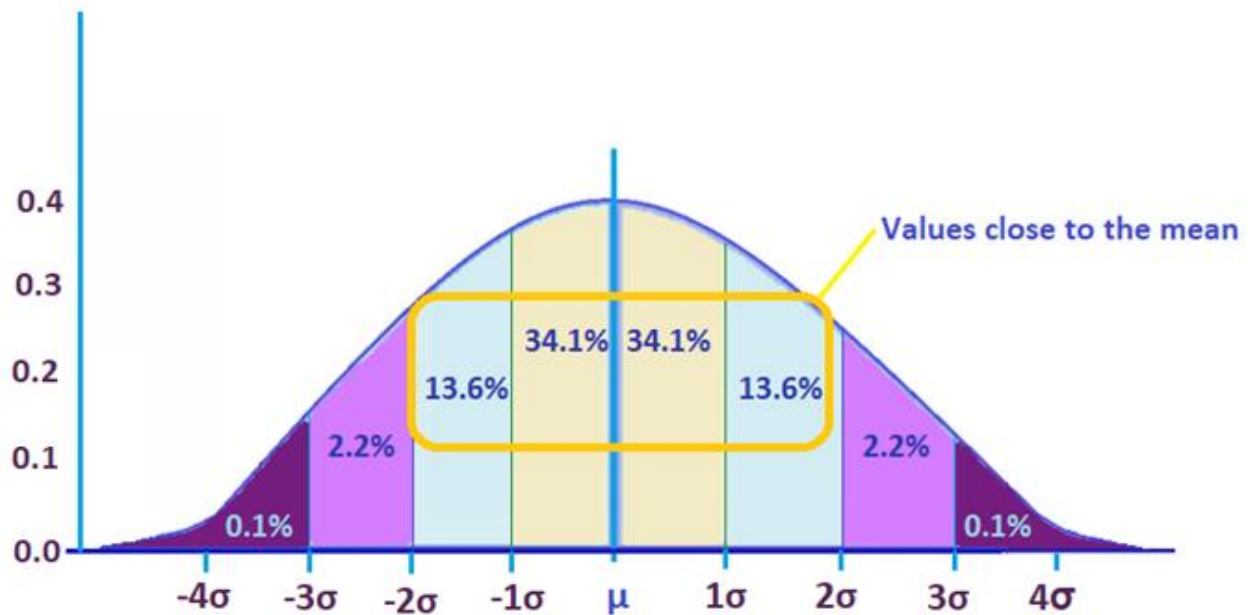
A normal distribution curve is also a theoretical representation of how frequently an experiment will yield a particular result.

How does standard deviation look in a normal distribution graph? See example image below.

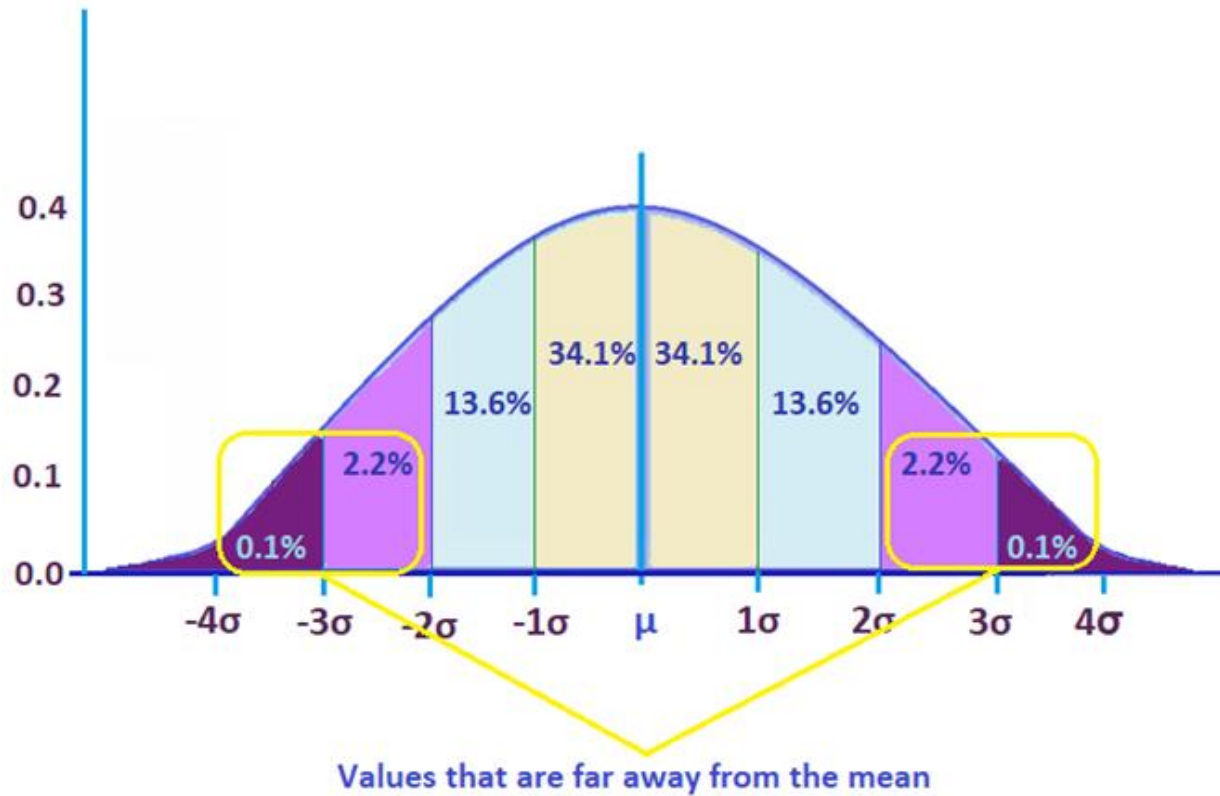
Each colored section represents **1 standard deviation from the mean**. For instance, 1σ signifies 1 standard deviation away from the mean, and so on. Likewise, -1σ is also 1 standard deviation away from the mean, but in the opposite direction.



The percentages represent how much data falls within each section. In this example, 34.1% of the data occurs within a range of **1 standard deviation from the mean**. Since it mirrors the other half of the graph, 34.1% of the data also occurs -1σ from the mean.



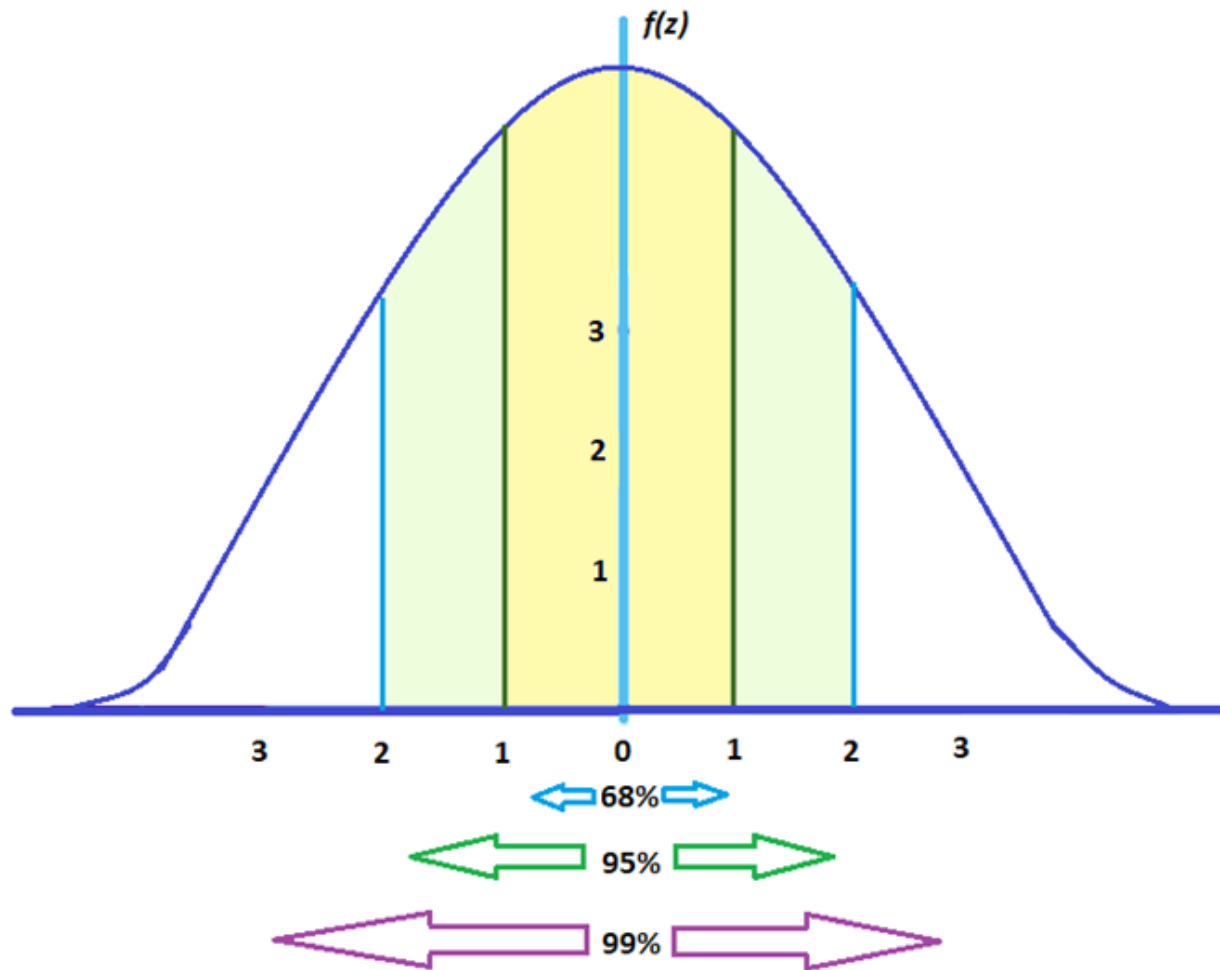
This graph above shows majority of the data, 95.5%, falls closer to the mean. This indicates it **has low standard deviation**.



The graph above shows that only 4.6% of the data occurred after 2 standard deviations.

Moreover, data tends to occur in a typical range under a normal distribution graph:

- Around 68% fall between -1 and 1
- Around 95% fall between -2 and 2
- Around 99% fall between -3 and 3



Standard Deviation in Histograms

Data can also be represented through a [histogram](#), which demonstrates numbers using bars of different heights. In a histogram, bars group numbers into ranges. A taller bar indicates a higher range.

A wider histogram suggests larger standard deviation, while a narrower one indicates lower standard deviation. See the examples below.

For instance, the following images illustrate histogram orientation for observed test scores based on 800 students, with a mean score of 100.

- English Test Scores SD = 7.5
- Math Test Scores SD = 15.3
- Physics Test Scores SD = 30.8

Out of the three examples, physics test scores demonstrate the highest standard deviation.

