1. **What are 𝑚𝑒𝑎𝑛, 𝑚𝑒𝑑𝑖𝑎𝑛, 𝑚𝑜𝑑𝑒, 𝑣𝑎𝑟𝑖𝑎𝑛𝑐𝑒, and 𝑠𝑡𝑎𝑛𝑑𝑎𝑟𝑑 𝑑𝑒𝑣𝑖𝑎𝑡𝑖𝑜𝑛 ?**

**Calculating Mean**

The mean identifies the average value of the set of numbers. For example, consider the data set containing the values 20, 24, 25, 36, 25, 22, 23.

To find the mean, use the formula: Mean equals the sum of the numbers in the data set divided by the number of values in the data set. In mathematical terms:

Mean= sum of all terms​ / how many terms or values in the set

### Calculating Median

The median identifies the midpoint or middle value of a set of numbers.

Put the numbers in order from smallest to largest. Use the example set of values: 20, 24, 25, 36, 25, 22, 23. Placed in order, the set becomes: 20, 22, 23, 24, 25, 25, 36.

Since this set of numbers has seven values, the median or value in the center is 24.

If the set of numbers has an even number of values, calculate the average of the two center values. For example, suppose the set of numbers contains the values 22, 23, 25, 26. The middle lies between 23 and 25. Adding 23 and 25 yields 48. Dividing 48 by two gives a median value of 24.

### Calculating Mode

The mode identifies the most common value or values in the data set. Depending on the data, there might be one or more modes, or no mode at all.

Like finding the median, order the data set from smallest to largest. In the example set, the ordered values become: 20, 22, 23, 24, 25, 25, 36.

A mode occurs when values repeat. In the example set, the value 25 occurs twice. No other numbers repeat. Therefore, the mode is the value 25.

In some data sets, more than one mode occurs. The data set 22, 23, 23, 24, 27, 27, 29 contains two modes, one each at 23 and 27. Other data sets may have more than two modes, may have modes with more than two numbers (as 23, 23, 24, 24, 24, 28, 29: mode equals 24) or may not have any modes at all (as 21, 23, 24, 25, 26, 27, 29). The mode may occur anywhere in the data set, not just in the middle.

### Calculating Standard Deviation

Standard deviation measures the variability of the data set. Like range, a smaller standard deviation indicates less variability.

Finding standard deviation requires summing the squared difference between each data point and the mean [∑(​x​ − ​µ​)2], adding all the squares, dividing that sum by one less than the number of values (​N​ − 1), and finally calculating the square root of the dividend. In one formula, this is:

**What is Gaussian distribution?**

1-Also called the standard normal distribution, is the normal distribution with mean zero and variance one. [Learn more in: Segmentation of Cardiac Magnetic Resonance Images](https://www.igi-global.com/chapter/segmentation-cardiac-magnetic-resonance-images/19591)

2.

Gaussian distribution, sometimes referred to as normal distribution, is a mathematical function that defines the probability of a number in some context falling between any two real constants. [Learn more in: Using Statistical Models and Evolutionary Algorithms in Algorithmic Music Composition](https://www.igi-global.com/chapter/using-statistical-models-and-evolutionary-algorithms-in-algorithmic-music-composition/113061)

3.

The Gaussian distribution is also commonly called the “normal distribution,” and is often described as a “bell-shaped curve.” If the number of events is very large, then a Gaussian distribution may be used to describe physical events. The normal distribution is useful because of the central limit theorem, which states that averages of random variables independently drawn from independent distributions become normally distributed when the number of random variables is sufficiently large. [Learn more in: Non-Parametric Statistical Analysis of Rare Events in Healthcare: Case of Histological Outcome of Kidney Transplantation](https://www.igi-global.com/chapter/non-parametric-statistical-analysis-of-rare-events-in-healthcare/186938)

4.

It is also known as normal distribution. It is a family of continuous probability distributions where each member of the family is described by two parameters: mean and variance. This form of distribution is used by the localization with extended Kalman filter algorithm to describe the posterior belief distribution of the robot pose.