Normalization and standardization are techniques used to preprocess data in machine learning and statistics. They help to scale features to ensure that models perform better, particularly when different features have different units or ranges. Here's a brief overview of each:

- # Normalization

Normalization (also known as Min-Max Scaling) transforms features to a common scale, usually between 0 and 1. It is useful when you want to ensure that all features contribute equally to the model, especially for algorithms that are sensitive to the scale of data, such as k-nearest neighbors or neural networks.

- # Standardization

Standardization (also known as Z-score normalization) transforms features to have a mean of 0 and a standard deviation of 1. It is useful when you want to center your data around zero, making it suitable for algorithms that assume data is centered and normally distributed, like linear regression or logistic regression.

Summary

- **Normalization** scales data to a fixed range, usually [0, 1].
- **Standardization** scales data to have a mean of 0 and a standard deviation of 1.

Choosing between normalization and standardization depends on the nature of your data and the requirements of the algorithm you're using