**Feature Scaling:**

When we have the values from the various ranges, then we will use feature scaling.

There are 2 scaling features.

1. Normalization – Scale down the feature between 0 to 1
2. Standardization – Scale down the feature based on standard normal distribution. The meaning of standard normal distribution is Mean is **Zero**, Standard deviation is **ONE.**

**Where we will use and where not:**

Feature scaling is required in Linear Regression, Logistic Regression, KNN, K-means Clustering, deep learning Techniques, etc

Feature scaling is not required in Decision Tree, random forest algorithms, Bagging and Boosting techniques.

**Normalization:**

In Normalization we use **MinMaxScaler**, The formula for Normalization is:

Normalization equation

Xmax and Xmin are the maximum and the minimum values of the feature respectively.

**Standardization:**

Also called as Z-Score normalization. The formula for Standardization is:

Standardization equation

**Encoding Techniques:**

**Nominal Encoding** – OneHotEncoding, OneHotEncoding with many category variables, Mean Encoding.

**Ordinal Encoding** – label Encoding, Target guided Ordinal Encoding