Bagging vs Boosting

### Bagging and Boosting are two types of Ensemble Learning. These two decrease the variance of a single estimate as they combine several estimates from different models. So the result may be a model with higher stability.

### Bagging:

It is a homogeneous weak learners’ model that learns from each other independently in parallel and combines them for determining the model average.

### Boosting:

It is also a homogeneous weak learners’ model but works differently from Bagging. In this model, learners learn sequentially and adaptively to improve model predictions of a learning algorithm.

# Bagging

Bootstrap Aggregating, also known as bagging, is a machine learning ensemble meta-algorithm designed to improve the stability and accuracy of machine learning algorithms used in statistical classification and regression. It decreases the variance and helps to avoid overfitting. It is usually applied to decision tree methods.

### Implementation Steps of Bagging

**Step 1:** Multiple subsets are created from the original data set with equal tuples, selecting observations with replacement.

**Step 2:** A base model is created on each of these subsets.

**Step 3:** Each model is learned in parallel with each training set and independent of each other.

**Step 4:** The final predictions are determined by combining the predictions from all the models.

# Boosting

Boosting is an ensemble modeling technique that attempts to build a strong classifier from the number of weak classifiers. It is done by building a model by using weak models in series.

### Implementation Steps of Boosting

**Step 1:** Initialize the dataset and assign equal weight to each of the data points.

**Step 2:** Provide this as input to the model and identify the wrongly classified data points.

**Step 3:** Increase the weight of the wrongly classified data points and decrease the weights of correctly classified data points. And then normalize the weights of all data points.

**Step 4:** if (got required results)

End

else

Go to step 2