

1. Typically, however, a smaller or lower value for the RSS is ideal in any model since it means there's less variation in the data set. In other words, the lower the sum of squared residuals, the better the regression model is at explaining the data.
2. The total sum of squares (TSS) measures how much variation there is in the observed data, while the residual sum of squares measures the variation in the error between the observed data and modeled values. The ESS is then: where. the value estimated by the regression line . In some cases (see below): total sum of squares (TSS) = explained sum of squares (ESS) + residual sum of squares (RSS).
3. Regularization refers to techniques that are used to calibrate machine learning models in order to minimize the adjusted loss function and prevent overfitting or underfitting. Using Regularization, we can fit our machine learning model appropriately on a given test set and hence reduce the errors in it.
4. Gini Impurity is a measurement used to build Decision Trees to determine how the features of a dataset should split nodes to form the tree
5. Decision trees are prone to overfitting, especially when a tree is particularly deep. This is due to the amount of specificity we look at leading to smaller sample of events that meet the previous assumptions. This small sample could lead to unsound conclusions.
6. Ensemble methods are techniques that aim at improving the accuracy of results in models by combining multiple models instead of using a single model. The combined models increase the accuracy of the results significantly. This has boosted the popularity of ensemble methods in machine learning.
7. Bagging is a method of merging the same type of predictions. Boosting is a method of merging different types of predictions. Bagging decreases variance, not bias, and solves over-fitting issues in a model. Boosting decreases bias, not variance.
8. The out-of-bag (OOB) error is the average error for each calculated using predictions from the trees that do not contain in their respective bootstrap sample. This allows the RandomForestClassifier to be fit and validated whilst being trained
9. K-fold Cross-Validation is when the dataset is split into a K number of folds and is used to evaluate the model's ability when given new data. K refers to the number of groups the data sample is split into. For example, if you see that the k-value is 5, we can call this a 5-fold cross-validation.
10. Hyperparameter tuning consists of finding a set of optimal hyperparameter values for a learning algorithm while applying this optimized algorithm to any data

set. That combination of hyperparameters maximizes the model's performance, minimizing a predefined loss function to produce better results with fewer errors.

11. In order for Gradient Descent to work, we must set the learning rate to an appropriate value. This parameter determines how fast or slow we will move towards the optimal weights. If the learning rate is very large we will skip the optimal solution.
12. Logistic regression is neither linear nor is it a classifier. The idea of a "decision boundary" has little to do with logistic regression, which is instead a direct probability estimation method that separates predictions from decision.
13. AdaBoost is the first designed boosting algorithm with a particular loss function. On the other hand, Gradient Boosting is a generic algorithm that assists in searching the approximate solutions to the additive modelling problem. This makes Gradient Boosting more flexible than AdaBoost.
14. In statistics and machine learning, the bias–variance tradeoff is the property of a model that the variance of the parameter estimated across samples can be reduced by increasing the bias in the estimated parameters.
15. Unlike linear or polynomial kernels, RBF is more complex and efficient at the same time that it can combine multiple polynomial kernels multiple times of different degrees to project the non-linearly separable data into higher dimensional space so that it can be separable using a hyperplane.