**K-Fold cross validation**

What is K-Fold? K-Fold is validation technique in which we split the data into k-subsets and the holdout method is repeated k-times where each of the k subsets are used as test set and other k-1 subsets are used for the training purpose.

<https://www.analyticsvidhya.com/blog/2021/09/how-to-apply-k-fold-averaging-on-deep-learning-classifier/#:~:text=conventional%20holdout%20method.-,What%20is%20K%2DFold%3F,used%20for%20the%20training%20purpose>.

**Shuffle-Split:**

ShuffleSplit will **randomly sample your entire dataset during each iteration to generate a training set and a test set**. The test\_size and train\_size parameters control how large the test and training test set should be for each iteration.

<https://scikit-learn.org/stable/modules/generated/sklearn.model_selection.ShuffleSplit.html>

**LOOCV(**Leave One Out Cross-Validation) is **a type of cross-validation approach in which each observation is considered as the validation set and the rest (N-1) observations are considered as the training set**. In LOOCV, fitting of the model is done and predicting using one observation validation set.

<https://www.geeksforgeeks.org/loocvleave-one-out-cross-validation-in-r-programming/#:~:text=LOOCV(Leave%20One%20Out%20Cross%2DValidation)%20is%20a%20type,using%20one%20observation%20validation%20set>.

**Smote function:**

Adds more points to balance the classes.

**Learning Curve to learn about bias and variance**

**High bias underfitting :**

Add more features

Decrease the regularization

**High Vairance :**

**Overfitting**

Add more data.

Remove less important feature.

**Grid Search:**

Grid Search **uses a different combination of all the specified hyperparameters and their values and calculates the performance for each combination and selects the best value for the hyperparameters**. This makes the processing time-consuming and expensive based on the number of hyperparameters involved

[**https://www.analyticsvidhya.com/blog/2021/06/tune-hyperparameters-with-gridsearchcv/**](https://www.analyticsvidhya.com/blog/2021/06/tune-hyperparameters-with-gridsearchcv/)

[**https://scikit-learn.org/stable/modules/generated/sklearn.discriminant\_analysis.LinearDiscriminantAnalysis.html**](https://scikit-learn.org/stable/modules/generated/sklearn.discriminant_analysis.LinearDiscriminantAnalysis.html)