

- What is GridSearchCV, RandomizedSearchCV

There is no way to know in advance the best values for hyperparameters, so ideally, we need to try all possible hyperparameter combinations to know the optimal values. Doing this manually could take a substantial amount of time and resources, and thus we use GridSearchCV to automate the tuning of hyperparameters. GridSearchCV hyperparameter tuning and optimization technique that helps to determine the optimal values for a given model.

Where CV = Cross Validation

Whereas RandomizedSearchCV randomly selects the set of hyperparameters and passes them to the model and calculates the score and gives the best set of hyperparameters that gives the optimal score among the selected ones. It means RSCV won't try every single permutation and combination of hyperparameter values, but it will try random combination.

- Why there is RCV when GSCV is already there?

So, there are some cons of using GSCV as well, like

- It is time consuming as it uses all the combinations of hyperparameters
- Computationally expensive
- Complexity increases with the increase in the number of parameters.
- Hence, it is not recommended if we have millions of rows and thousands of columns.

In such case, we should be using RSCV to save our time and computation expense.

- When to use what CV?

GridSearchCV is ideal when our dataset is not big enough. Otherwise, it is always recommended to use RSCV. Although GSCV gives us best parameter values but if you can afford high computation cost and have enough time then it makes sense otherwise we should be using RSCV.

- Can we use it together? If yes, in what order or in no order?

Yes, But first we should use RSCV and if we're not happy with the result then only we should use GSCV.