**What is GridSearchCV and RandomizedSearchCV?**

GridSearchCV:

GridSearchCV is a scikit-learn method for hyperparameter tuning. It exhaustively searches a specified hyperparameter space for the best combination of hyperparameters that result in the highest performance of a machine learning model, as measured by a scoring function. The scoring function can be a default scoring metric for the model, such as accuracy for classification or R^2 for regression, or it can be a user-defined scoring function. The GridSearchCV method takes a model, a hyperparameter grid, and a scoring function as input, and returns the best hyperparameters and their corresponding score.

RandomizedSearchCV:

RandomizedSearchCV is a scikit-learn method for hyperparameter tuning that performs a randomized search over a specified hyperparameter space. Unlike GridSearchCV, which exhaustively searches over the entire hyperparameter space, RandomizedSearchCV samples from the hyperparameter space a specified number of times, making it computationally more efficient for large hyperparameter spaces. The method takes a model, a hyperparameter distribution, a scoring function, and the number of iterations to sample as input, and returns the best hyperparameters and their corresponding score, based on the highest value of the scoring function.

**- Why there is RCV when GSCV is already there?**

RandomizedSearchCV can be a useful alternative to GridSearchCV when the hyperparameter space is too large to perform an exhaustive search.

**- When to use what CV?**

GridSearchCV is suitable for small hyperparameter spaces, while RandomizedSearchCV is more efficient for large hyperparameter spaces or when computational resources are limited.

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

Yes, both GridSearchCV and RandomizedSearchCV can be used together, in either order.

One approach is to first use RandomizedSearchCV to get a rough idea of the best hyperparameters, and then use GridSearchCV to perform a more exhaustive search around the best hyperparameters found by RandomizedSearchCV. This approach can be more computationally efficient than running GridSearchCV over the entire hyperparameter space from the beginning.

Another approach is to use GridSearchCV first to perform an exhaustive search over the hyperparameter space, and then use RandomizedSearchCV to fine-tune the best hyperparameters found by GridSearchCV.

The order in GridSearchCV and RandomizedSearchCV can be used depends on your specific use case, computational resources, and desired level of accuracy in finding the best hyperparameters.