Grid Search

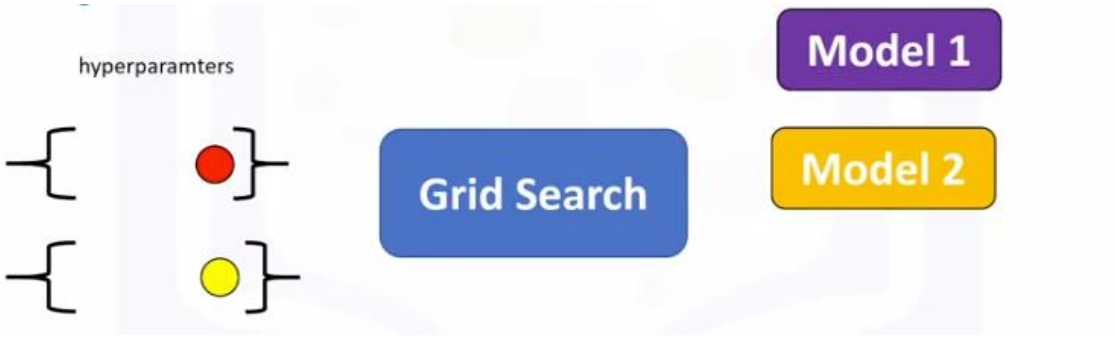
Grid Search allows us to ***scan through multiple free parameters*** with few lines of code. Parameters like the alpha term are not part of the fitting or training process; these values are called hyperparameters. *Scikit-learn automatically iterates over these hyperparameters using cross-validation. This method is called Grid Search*.

Grid Search

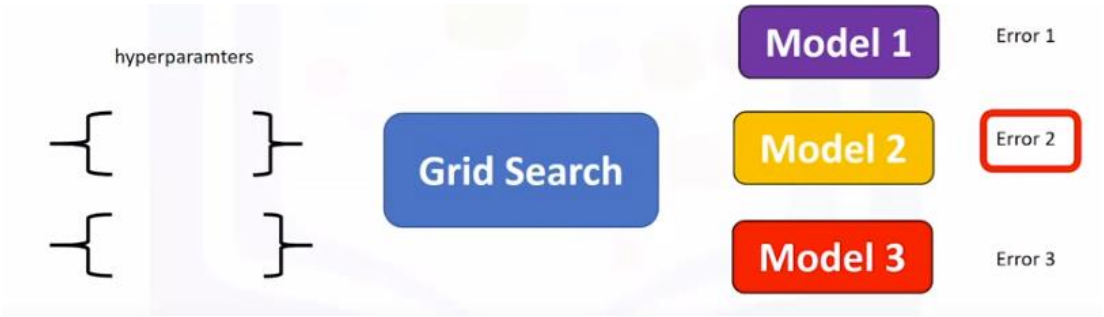
- **takes the model or objects** we want to train and **different values of the hyperparameters**.
- **calculates the MSE or R-squared** for various hyperparameter values, allowing you to choose the best values.

Let the small circles represent different hyperparameters. We start off with one value for hyperparameters and train the model. We use different hyperparameters to train the model.

We continue the process until we have exhausted the different free parameter values.

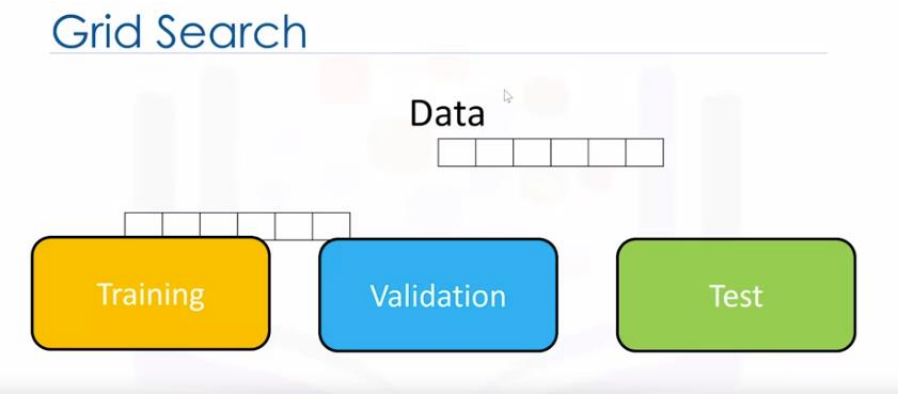


Each model produces an error. **We select the hyperparameter that minimizes the error**.

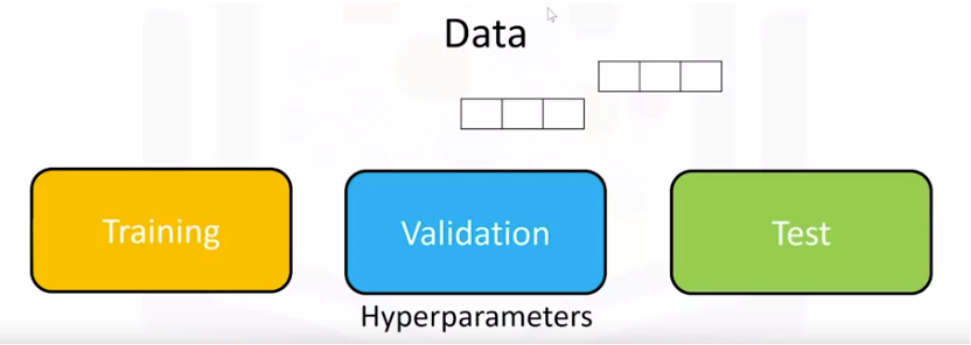


To select the hyperparameter,

- we split our dataset into three parts, the training set, validation set, and test set.
- We train the model for different hyperparameters.



- We use the R-squared or mean square error for each model. We select the hyperparameter that minimizes the mean squared error or maximizes the R-squared on the validation set.



- We finally test our model performance using the test data.