REGULERIZATION

While training a machine learning model, the model can easily be overfitted or under fitted. To avoid this, we use regularization in machine learning to properly fit a model onto our test set. Regularization techniques help reduce the chance of overfitting and help us get an optimal model. In this article titled 'The Best Guide to Regularization in Machine Learning', you will learn all you need to know about regularization.

UNDEFETING(MODEL IS NOT LEARNING VALUE PROPERLY)- A scenario where a machine learning model can neither learn the relationship between variables in the testing data nor predict or classify a new data point is called Underfitting.

OVERFITING(THE MODEL IS LEARNING ENTIRE VALUE OULLIER ALSO) -A scenario where the machine learning model tries to learn from the details along with the noise in the data and tries to fit each data point on the curve is called OverfittinG

BIAS - A Bias occurs when an algorithm has limited flexibility to learn from data. Such models pay very little attention to the training data and oversimplify the model therefore the validation error or prediction error and training error follow similar trends. Such models always lead to a high error on training and test data. High Bias causes underfitting in our model.

VARIANCE -Variance defines the algorithm's sensitivity to specific sets of data. A model with a high variance pays a lot of attention to training data and does not generalize therefore the validation error or prediction error are far apart from each other. Such models usually

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perform very well on training data but have high error rates on test data. High Variance causes overfitting in our model.

An optimal model is one in which the model is sensitive to the pattern in our model, but at the same time can generalize to new data. This happens when Bias and Variance are both optimal. We call this Bias-Variance Tradeoff and we can achieve it in over or under fitted models by using Regression

Regularization Techniques

There are two main types of regularization techniques: Ridge Regularization and Lasso Regularization.

Lasso Regression (L1)

It modifies the over-fitted or under-fitted models by adding the penalty equivalent to the sum of the absolute values of coefficients.

Ridge Regularization (L2) :

Also known as Ridge Regression, it modifies the over-fitted or under fitted models by adding the penalty equivalent to the sum of the squares of the magnitude of coefficients.

ELASTICNESS- combination of L1 and L@

whenewer we use linear model we have to use regularizatin

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