Hyperparameters

01 June 2023 20:41

Hyperparameters

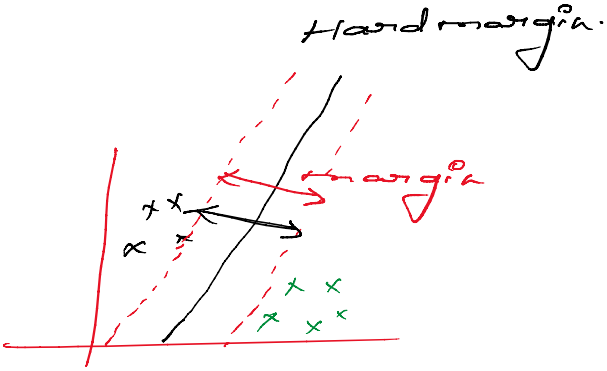
Hyperparameters are learning parameters which helps model in learning properly.

Hyperparameters in SVM are

1. C
2. γ [Gamma]

C → Cost of misclassification

Hard margin.

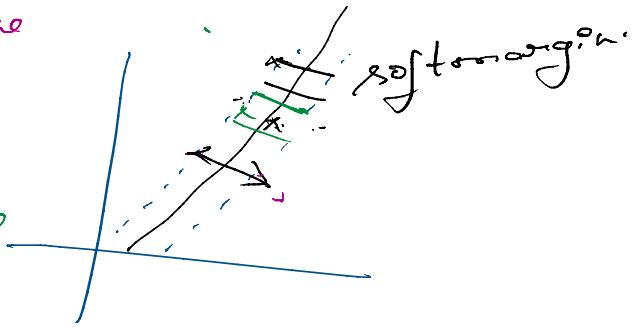


Soft margin

* It is a distance between support vector and hyperplane when data is non linear
* Since distance is less it results in misclassification

Hard margin.

* It is a distance between support vector and hyperplane when data is Linear
* when its hard margin we see less amount of misclassification.



C → C is the penalty added to the soft margin in order to reduce the amount of misclassification.

Imp

1. C is small → Penalty added to the misclassification less, C cannot be small.
2. C is large → Penalty added to the misclassification is more., C should always be large

γ → Gamma

Gamma is also a learning parameter which helps model in learning things better way.

i.e. in RBF kernel which

helps model in learning things better way.

→ Gamma is a parameter in RBF kernel which controls the distance between two observation

$$f(x, x_j) = \exp(-\gamma \|x - x_j\|^2)$$

0.7 x 4 = 2.8

① Gamma value should always be small.

② If Gamma is high it results in overfitting

overfitting → Training score will be good but testing score will be bad.

Shortnote:

Hyperparameters in SVM

→ C → penalty added to reduce misclassification
C should always be high.

→ γ → It controls distance
γ should always be less

Hyperparameter Tuning techniques

It is one of the very important technique in machine learning which helps in enhancing the model performance by choosing best hyperparameter value.

Break → 9.36 → 9.50

* Grid Search CV

It is one of the hyperparameter tuning technique which helps in choosing best values for hyperparameters.

$C = [0.8, 0.7, 2.4110]$

$\gamma = [0.01, 0.001, 0.1, 0.2]$

SVM

C = 0.8, γ = 0.01 → f1
C = 0.8, γ = 0.001
C = 0.8, γ = 0.1
C = 0.8, γ = 0.2