

# Grid & Random Layouts in ML

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# What is Hyper parameter Tuning ?

- ▶ **Parameter :**

A configuration variable that is internal to the model whose value can be estimated from the given data.

- ▶ Eg : weights , Support Vectors, Co efficients

## Hyper parameters ?

- ▶ A configuration that is external to the model
- ▶ whose value cannot be estimated from data.

- ▶ **Eg:** K in KNN, Learning rate in Neural Networks

# Why is Hyper parameter Tuning ?

- ▶ For better accuracy
- ▶ Proper prediction

# How to tune ?

- ▶ Although there are many techniques, the major ones are :
  - ▶ 1) Grid Search
  - ▶ 2) Random Search

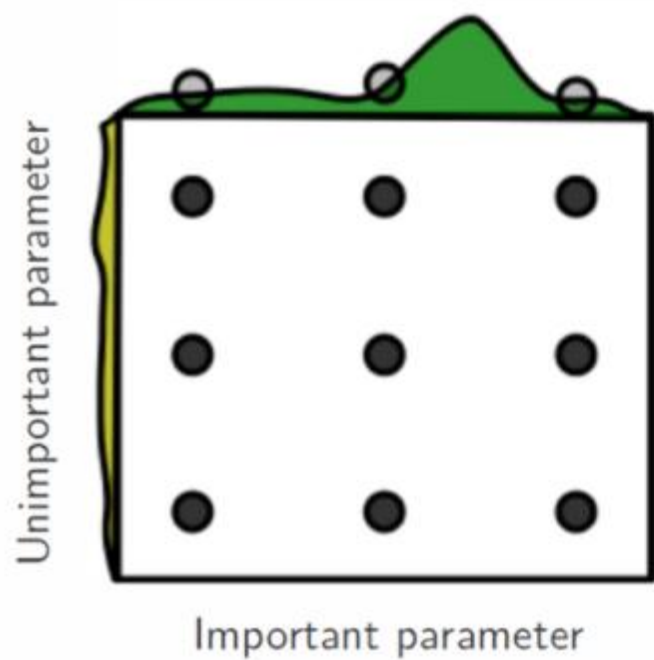
# 1) Grid Search

- ▶ will methodically build and evaluate a model for each combination of algorithm parameters specified in a grid.
- ▶
  - $a_1 = [0,1,2,3,4,5]$
  - $a_2 = [10,20,30,40,5,60]$
  - $a_3 = [105,105,110,115,120,125]$

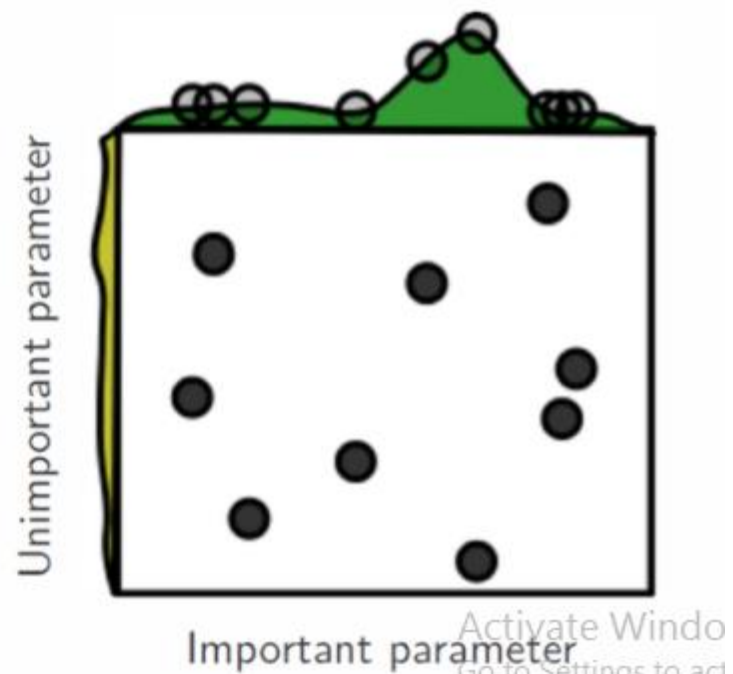
## 2) Random Search :

- ▶ We define a sampling distribution for each hyper parameter.
- ▶ could also define how many iterations we'd like to build when searching for the optimal model.
- ▶ **Reason to prefer** : for most cases, hyper parameters are not equally important, so grid fails here.

Grid Layout



Random Layout



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