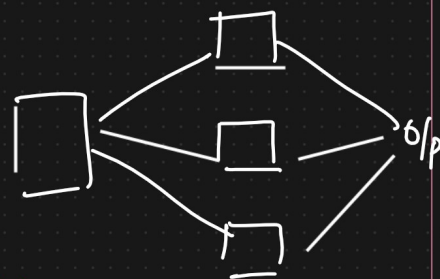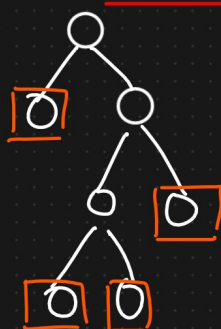# Boosting Algorithms

① Adaboost

② Gradient Boost

③ Xgboost.

Boosting

Decision Tree

TRAINING DATA

Overfitting :

TRAIN ACC ↑↑

TEST ACC ↓↓

Low Bias

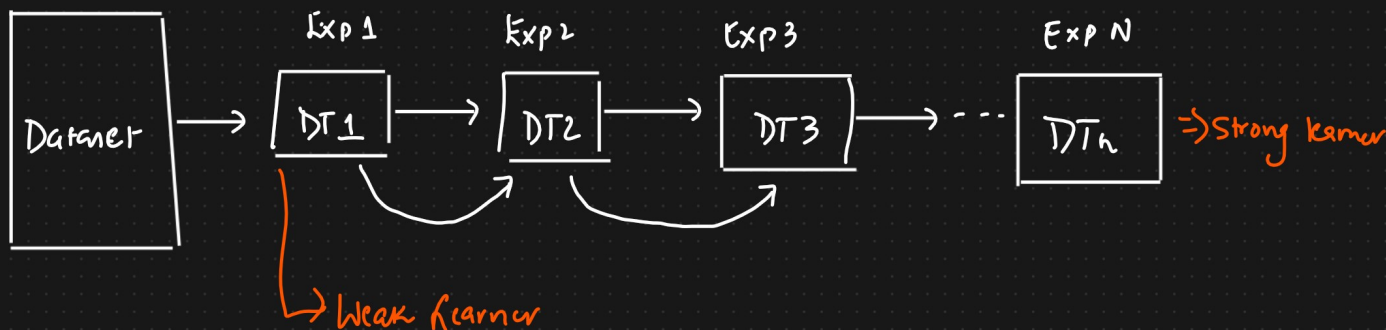High Variance $\Big\}$ ⟹ Random Forest ⟹ $\Big\{$ Low Bias

Low Variance

Generalized Model

o/p

↑   ↑   ↑

Boosting { Decision Trees Sequentially Connected}

KBC

Exp 1   Exp 2   Exp 3   Exp N

Dataset → DT 1 → DT2 → DT3 → ... DTn ⟹ Strong learner

↳ Weak Learner

Weak Learners : Haven't learnt much from the Training Dataset

Bagging $\longrightarrow$ Random Forest $\longrightarrow$ Majority Voting $\cdot$ [Average of all O/p]

Boosting $\longrightarrow$ Assignments of weights to the weak Learners

Boosting

$$f = \alpha_1(M_1) + \alpha_2(M_2) + \alpha_3(M_3) + \cdots + \alpha_n(M_n) \quad \begin{array}{l} \rightarrow \text{Classification} \\ \\ \rightarrow \text{Regression} \end{array}$$

$\{\alpha_1, \alpha_2, \alpha_3 \cdots \alpha_n\} \Rightarrow$ Weights