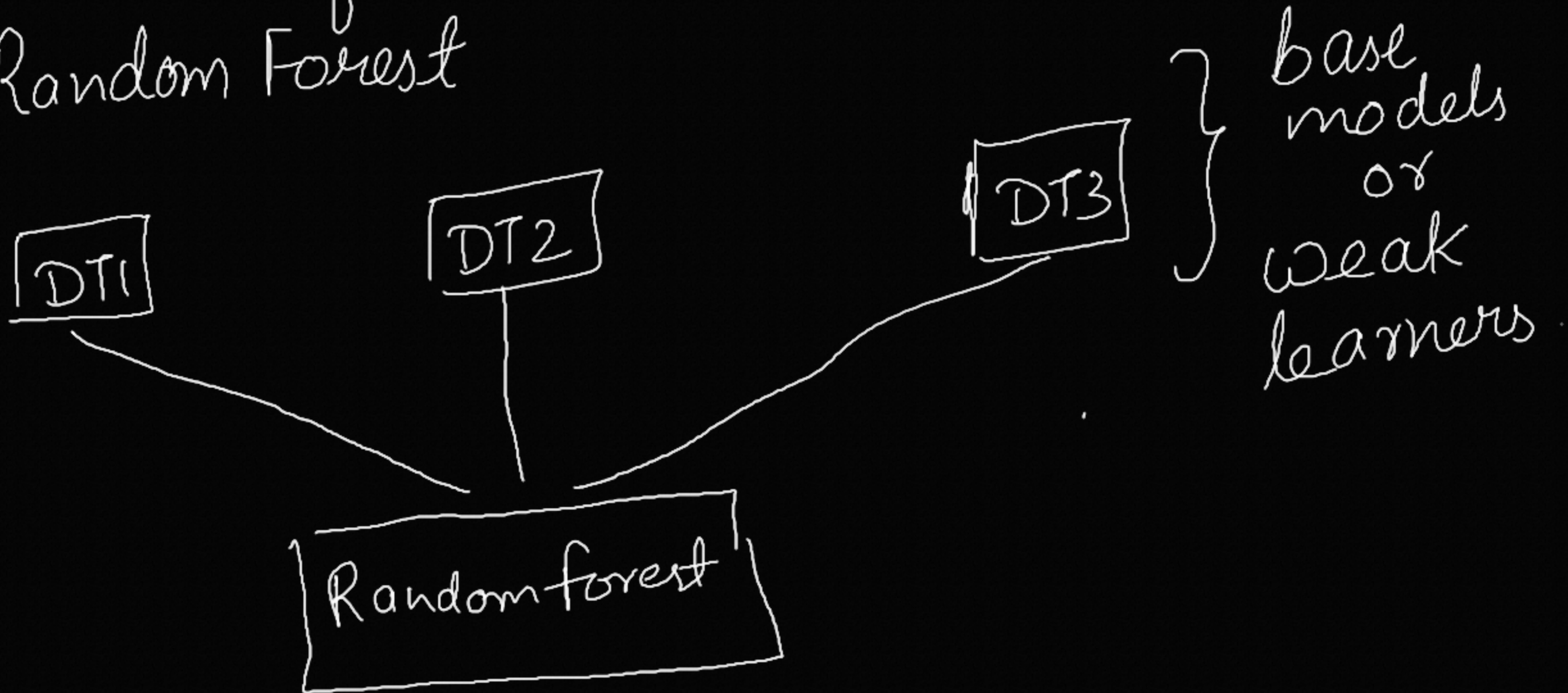


Ensemble learning

Combination of multiple models

eg. Random Forest



Two Types

Bagging

eg. Random
Forest

//

Boosting

eg. Gradient Boost
XG Boost

Catboost

Adaboost

LG, BM

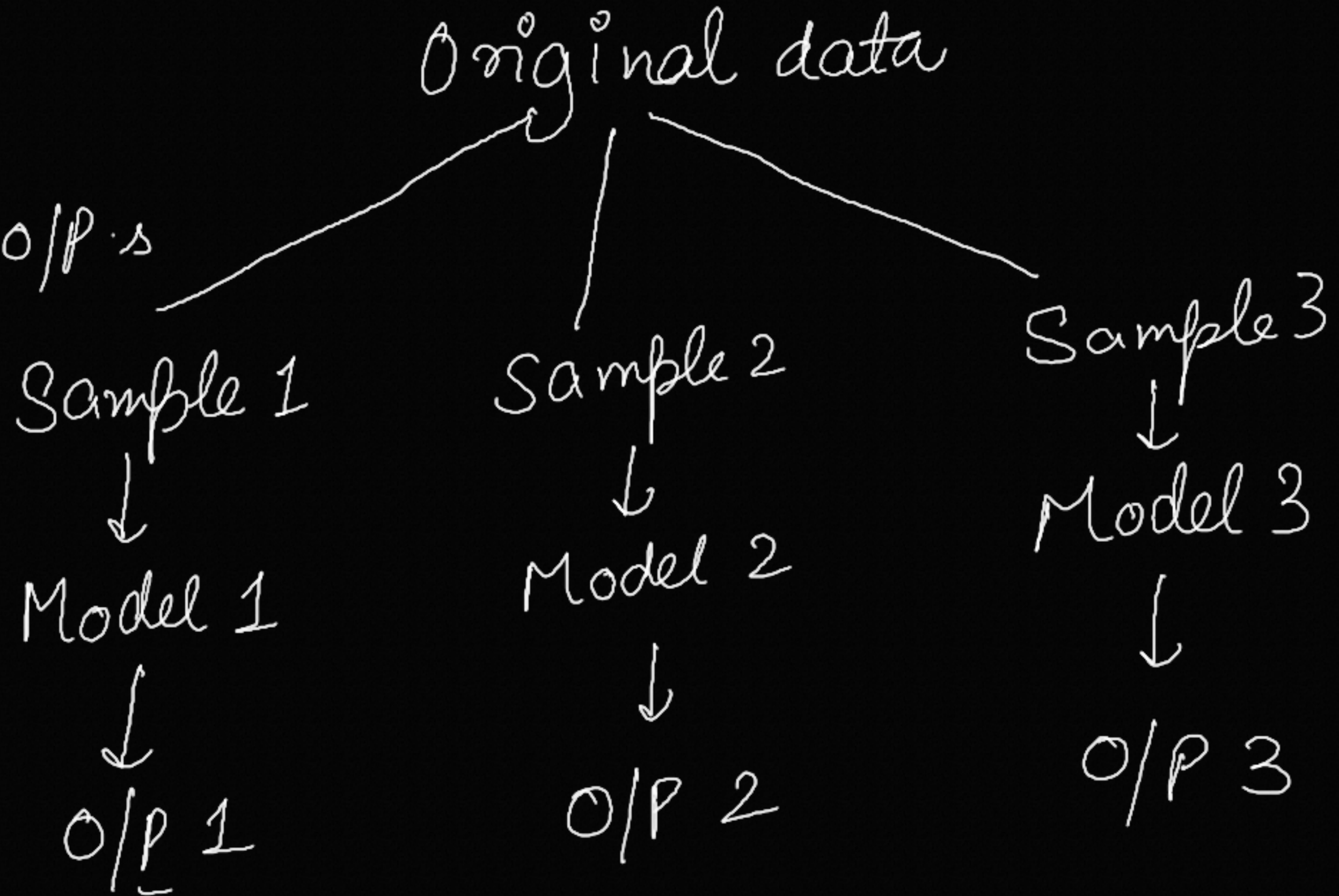
① Bagging (Bootstrap Aggregation)

* Working :-

Regression: Mean of o/p's

Classification

Voting



* Parallel learning Models

* When to use?

⇒ Reduce Variance (overfitting)

② Boosting

* Working :-

final prediction combines all o/p but importance is given to more accurate weak learner.

We have 3 weak learners

Original data

↓
1st weak learner (5 error)

↓ O/P 1

— 2nd weak learner (3 error)

↓ O/P 2

✓ 3rd weak learner (1 error)

↓ O/P 3

* Sequential Learning Model

eg. 3 students \rightarrow John, Rahul, Mohan
Apple actual weight = 150gms

1st weak learner (John) \Rightarrow Guess = 100gm
Error = 50gm

2nd weak learner (Rahul) \Rightarrow Guess = 120gm
Error = 30gm

3rd weak learner (Mohan) = Guess = 140 gm
Error = 10 gm

Final Prediction

1st
100
heart

2nd
120

3rd
140
↓

Most imp

Final O/P = 147 gm

* When to use?

⇒ Reduce bias (underfitting)

* Problem: Prone to overfitting