Recap: ✳ Ensemble Learning

Agenda

① Bagging

→ Implementation

→ Random forest ML

② Boosting

→ ML

→ Implementation

Boosting Technique

1) It is one of the type of the type of Ensemble learning.
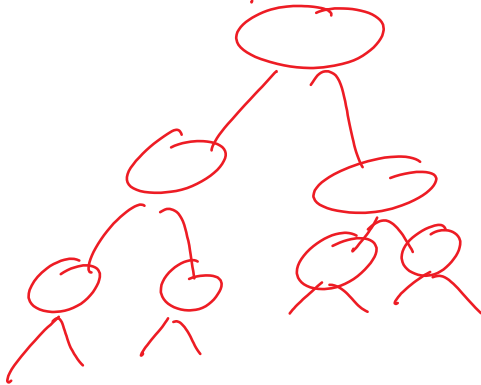
2) Here we arrange the base Model sequentially.

#dataset $\Rightarrow$ $\boxed{M1}$ O/P $\xrightarrow{I/N}$ $\boxed{M_2}$ O/P $\xrightarrow{I/N}$ $\boxed{M_3}$ O/P $\rightarrow$ $\boxed{My}$ $\rightarrow$ O/P

dataset
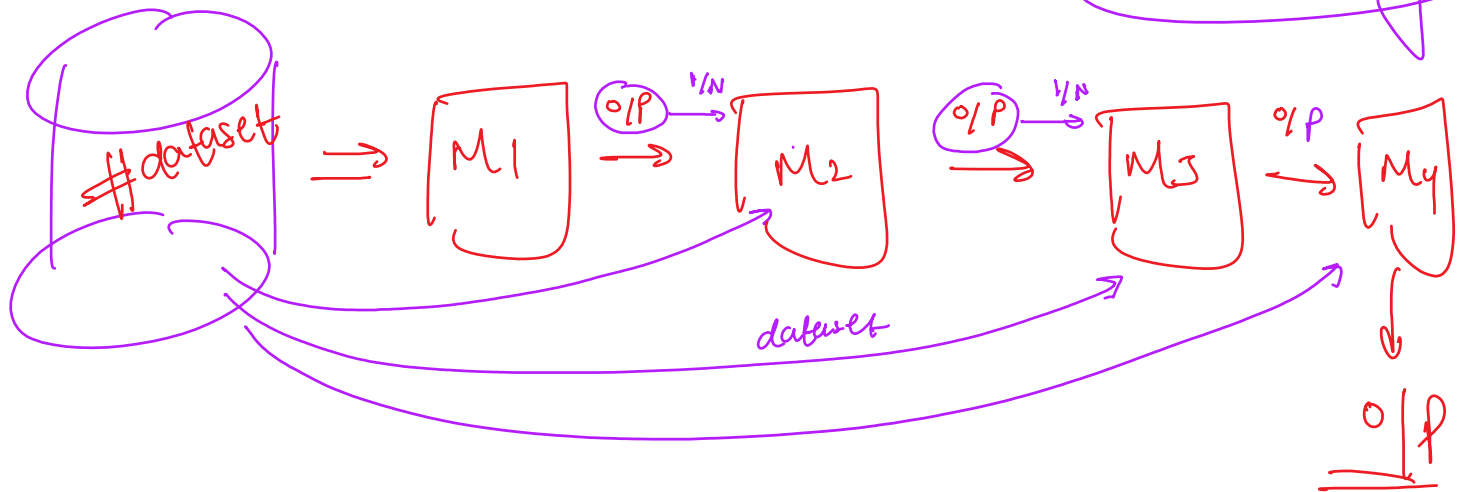
Bagging $\Rightarrow$ Random forest ML.

Boosting $\rightarrow$ Adaboost ML Alg.

$\# \text{Bagging}$
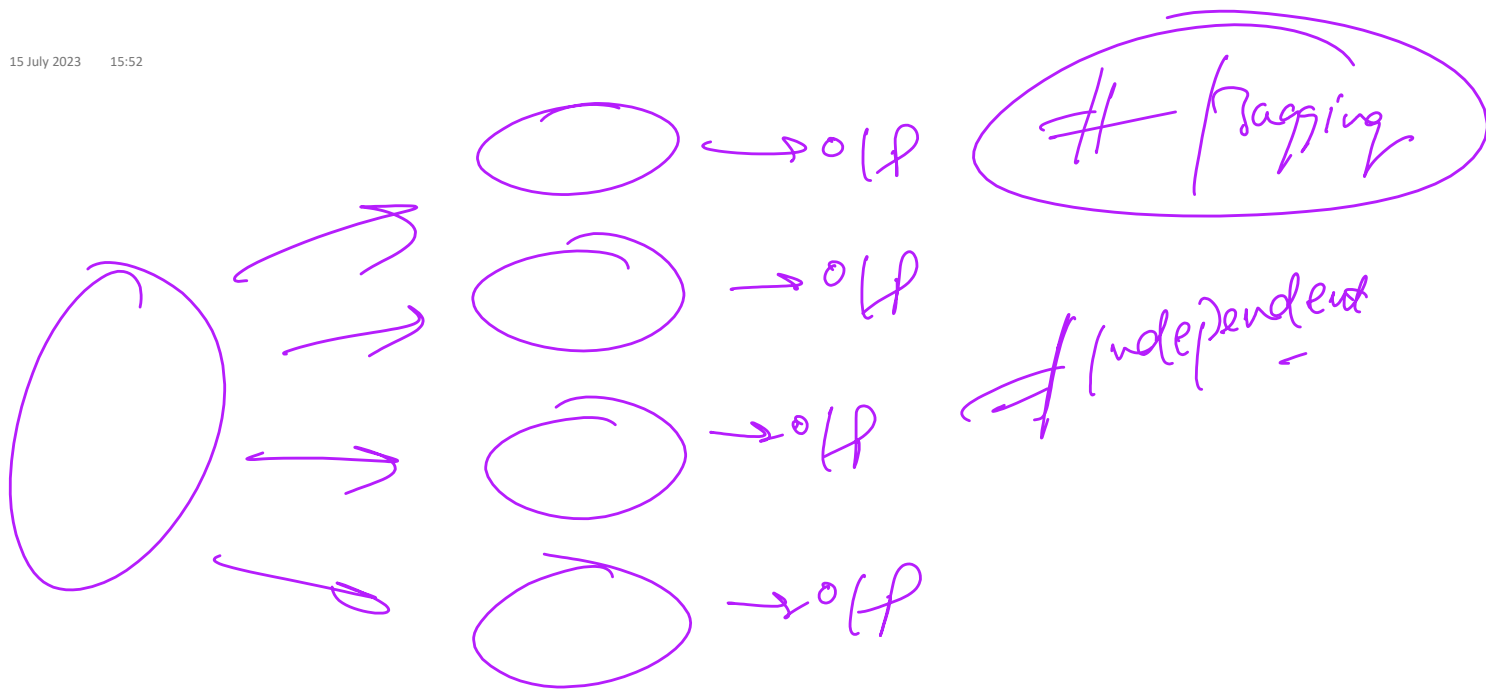
$f(\text{Independent})$

Random forest Algo.	Adaboost ML Algo.
(1) Here Multiple Models are build parallely.	(1) Here Multiple Models are build sequentially.
(2) Here all base models will work independently.	(2) Here base models will work dependently
(3) for the Master Model, the Contribution from each base model is equal.	(3) Here for the Master Model, the Contribution from each base model is unequal.
(4) In Random forest you will get fully grown decision tree.	(4) In Adaboost, we will get Stumps. Stumps ⇒ one root node and two leaf node.

O/P

O/P

O/P

O/P

$\Rightarrow$ Single O/P

I/P

M1 $\rightarrow$ O/P $\rightarrow$ M2 $\rightarrow$ O/P $\rightarrow$ M3

I/P

I/P
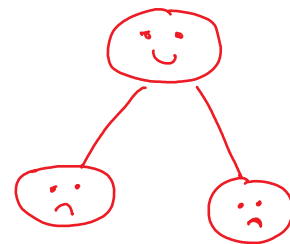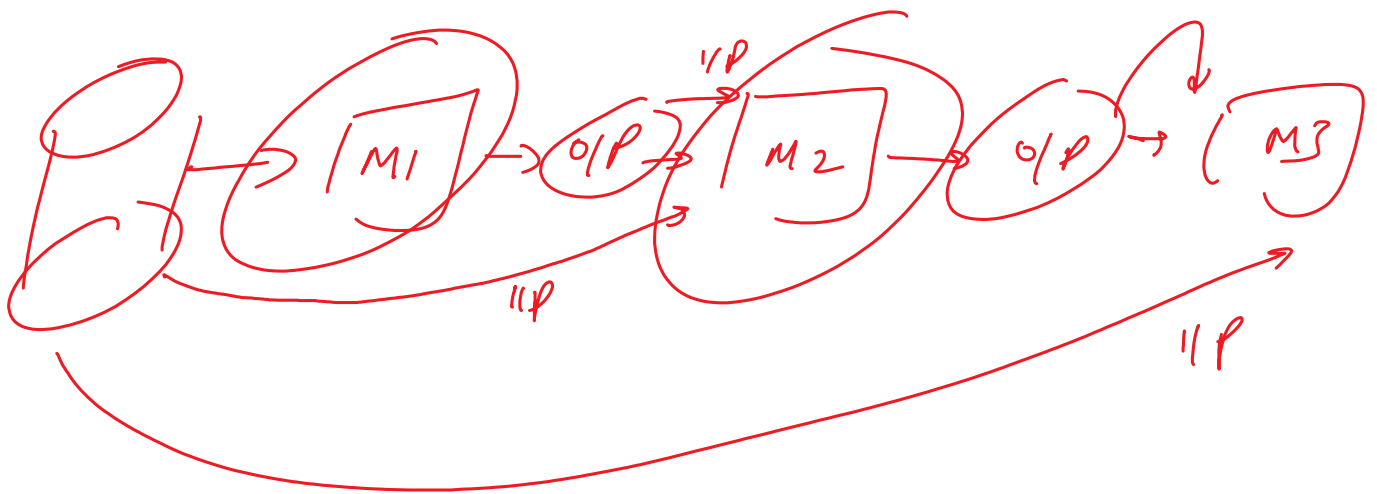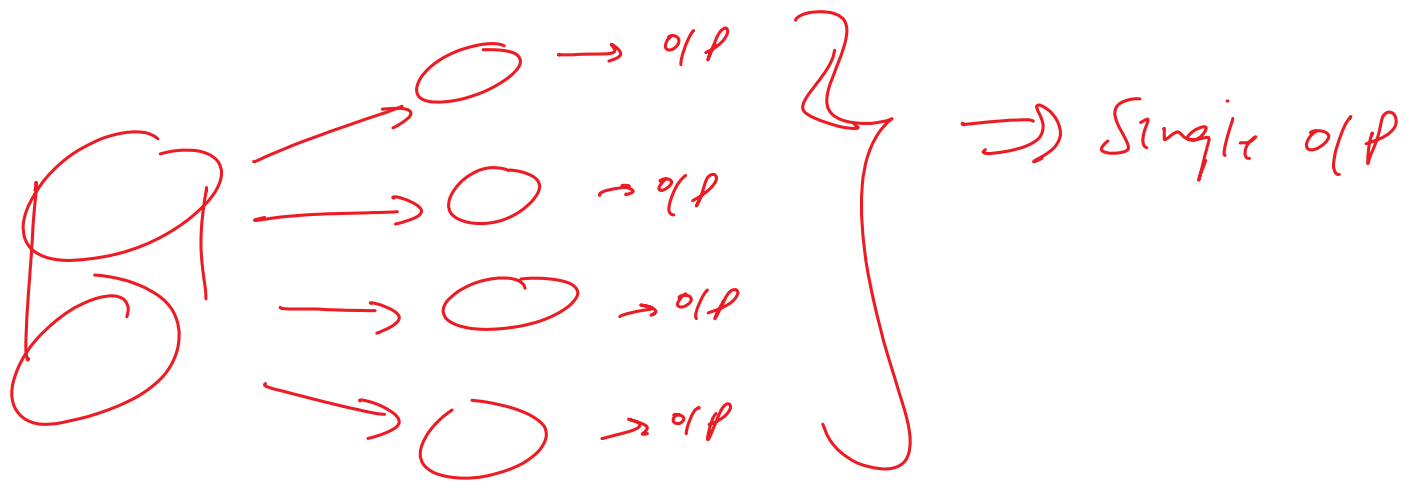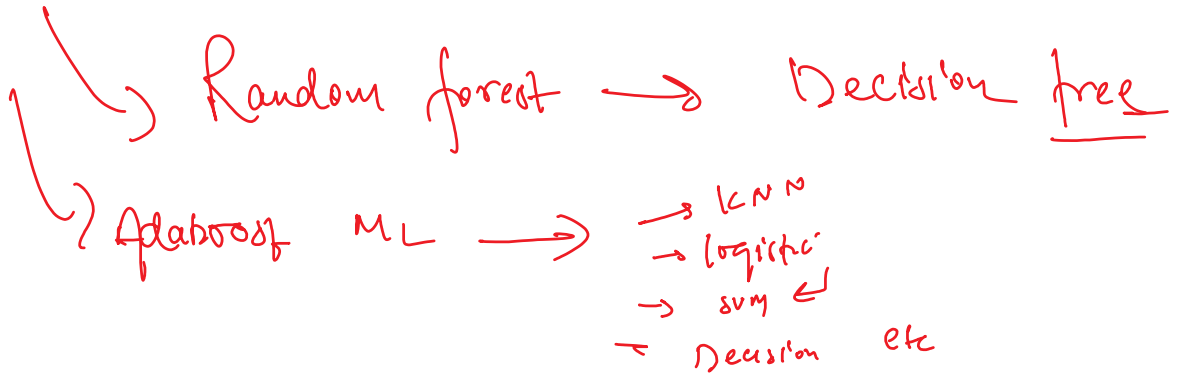
Note: * Adaboost can handle both Regression and

Classification type of problem.

*

ensemble L : → Multiple base learner

↳ Random forest → Decision tree

↳ Adaboost ML → → KNN
→ logistic
→ svm ↩
↳ Decision etc

$\Rightarrow$ One Hot Encoding

$\Rightarrow$ Label Encoding

feature Encoding :- The Process of converting Categorical column into respective Numerical column a is Called as feature Encoding

Gender

Male
female
male
male
female

$\Rightarrow$

one hot Encoding $\Rightarrow$

Male_Gender	Female_Gender	
1	0	✓ M
0	1	✓ F
1	0	✓ M
1	0	✓ M
0	1	✓ F

Gender

M
F
M
F
O
F
O
M

$\Rightarrow$ One hot encoding

M-Gender	F. Gender	Other
1	0	0
0	1	0
1	0	0
0	1	0
0	0	1
0	1	0
0	0	1
1	0	0