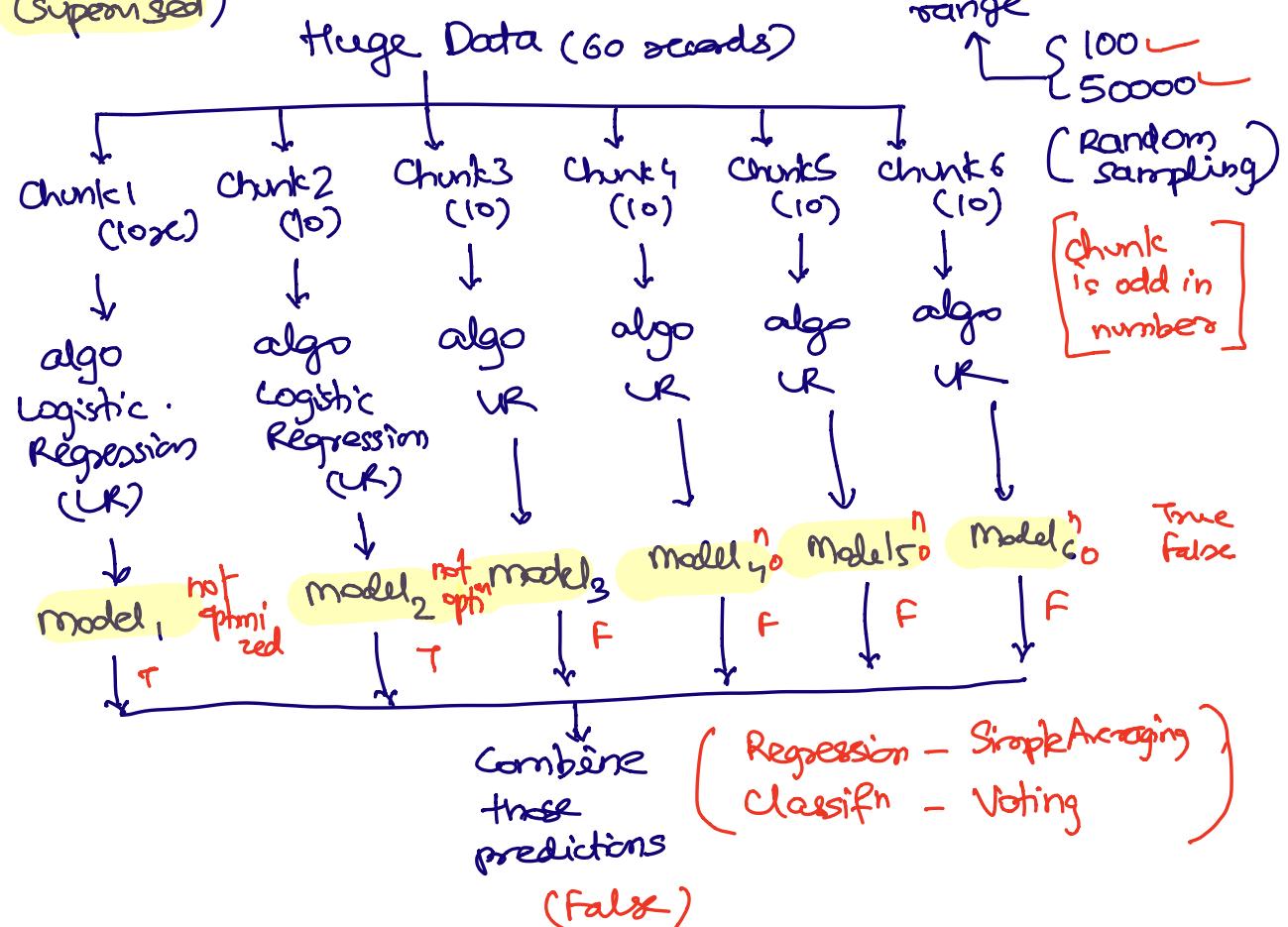


- Bagging and Boosting
- Unsupervised Learning
  - k-means algo.
- Recommendation Systems.

## Bagging and Boosting

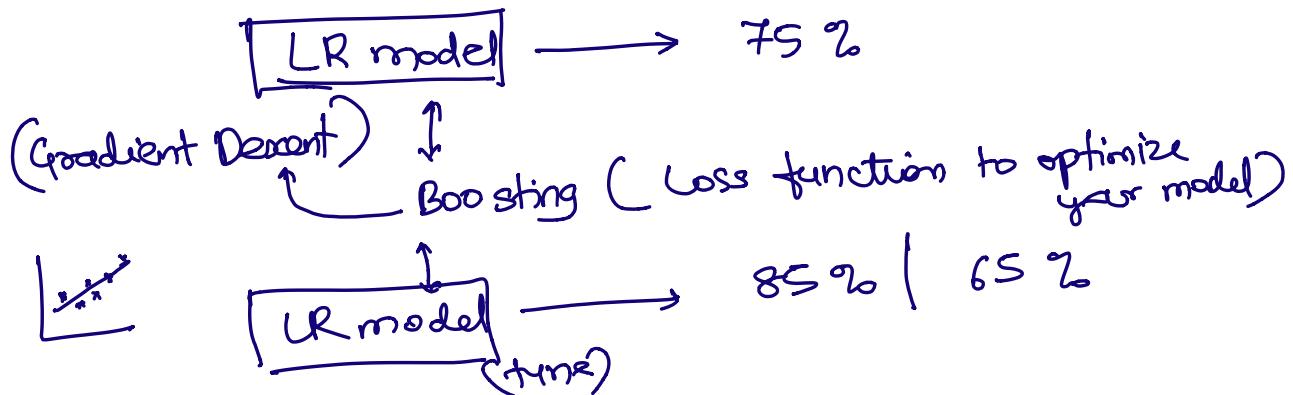
Bagging → Bootstrap aggregation / aggregating  
 (Supervised)



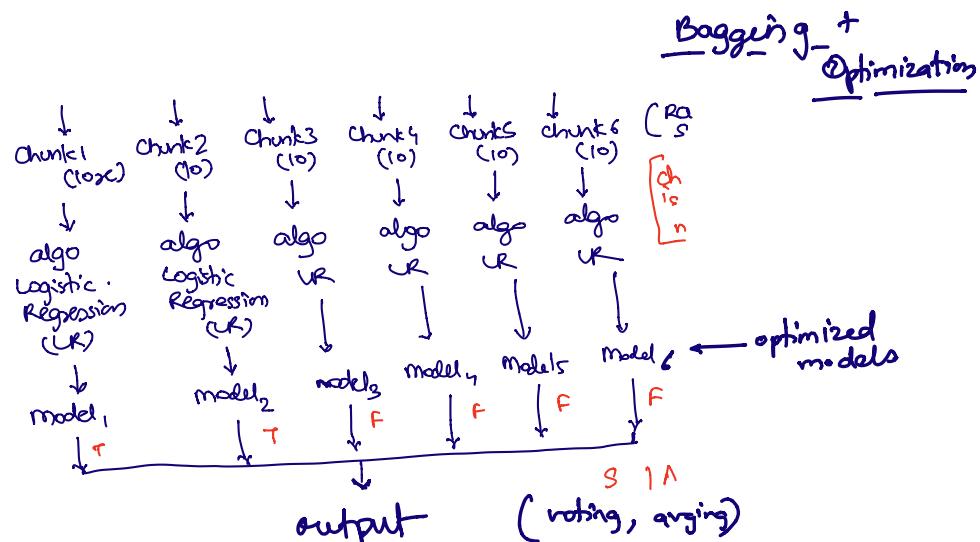
Bagging is all about getting better results using VOTING - or SIMPLE AVG.

Boosting: (Applied on Deep Learning and not on ML)

- helps in fine tuning your model based on hyperparameters and/or Error/Loss functions.

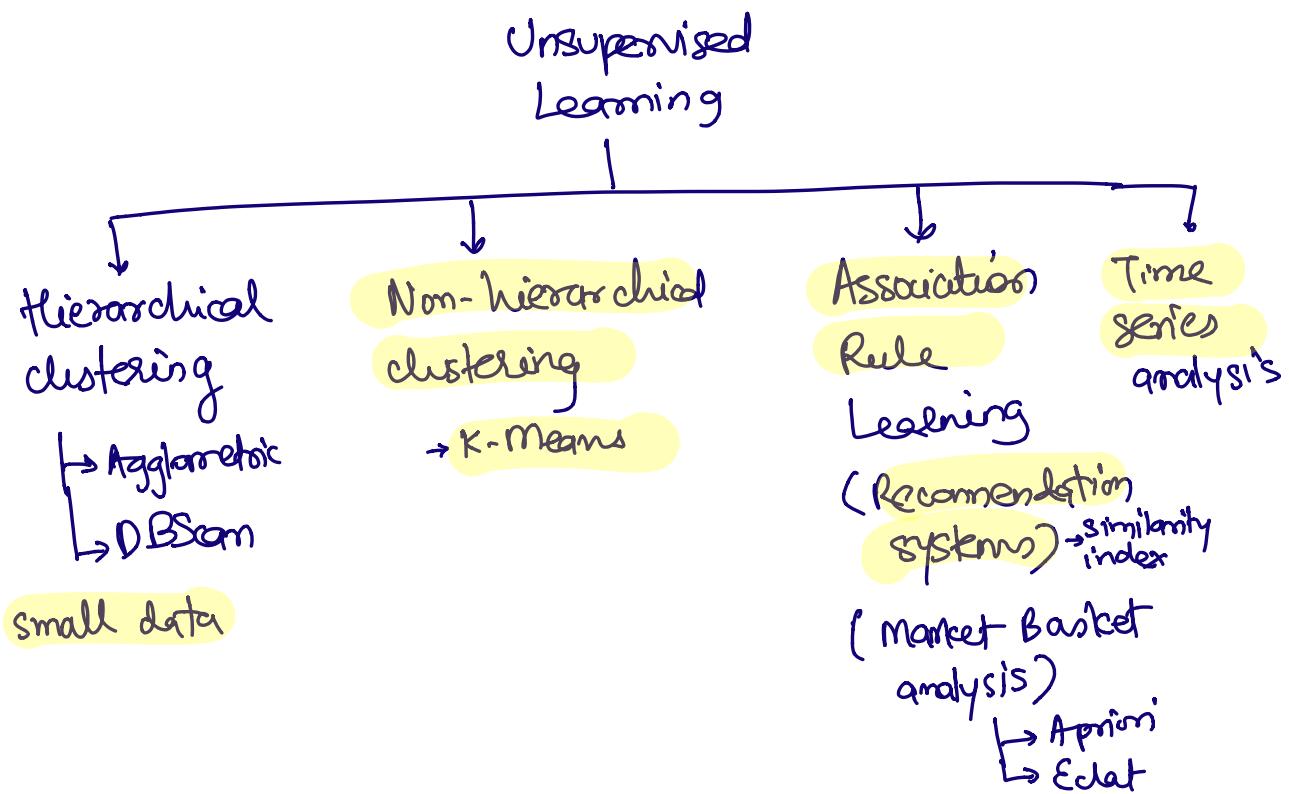


- ① Adaptive Boosting
- ② Gradient Boosting
- ③ XGBoost (Extreme Gradient Boosting).



## UN-SUPERVISED LEARNING:

- Data with no label.
- To discover patterns.
- No answer is correct, No answer is wrong.
- we simply deploy the categorization.

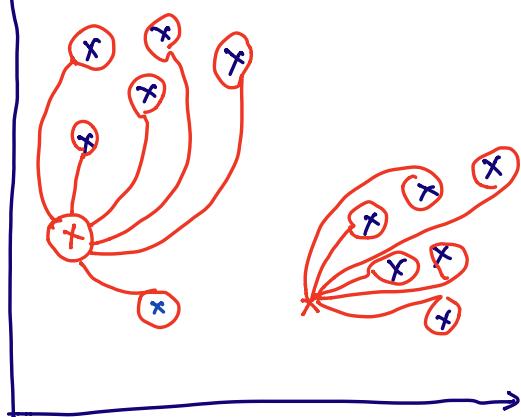


## k-Means algo

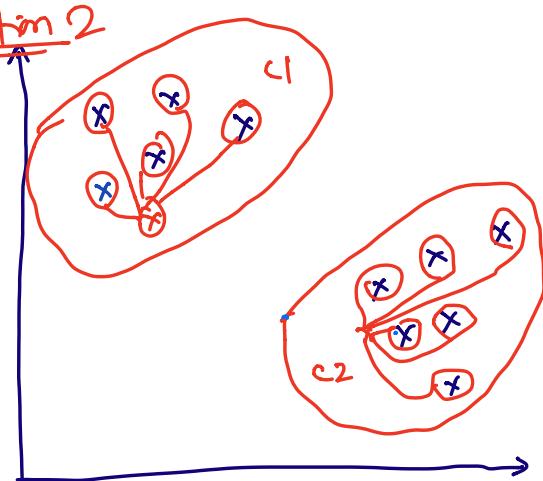
assumption based on plot is  
there exists 2 groups

$$[k = 2]$$

### Iteration 1



### Iteration 2



① Identify the ideal k value

1. check respective plots.

2. Check using k-means++ inertia)

\* - Cluster centers.

Distance formula.

→ ① Euclidean distance

② Manhattan distance

no new pts have changed  
their cluster!

CATEGORIZATION OF

EACH PT

GETS DONE !

## Recommendation Systems

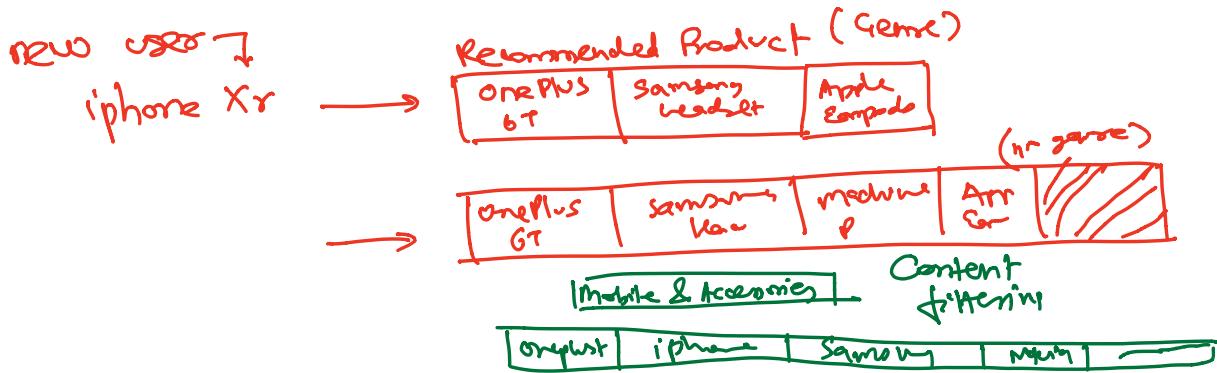
It's a system that filters the data based on condition and recommends relevant objects to your input.

myshopping.com → Registration is mandatory.

Brashant → OnePlus 6T, Machine Learning, Apple Earpods Using Python

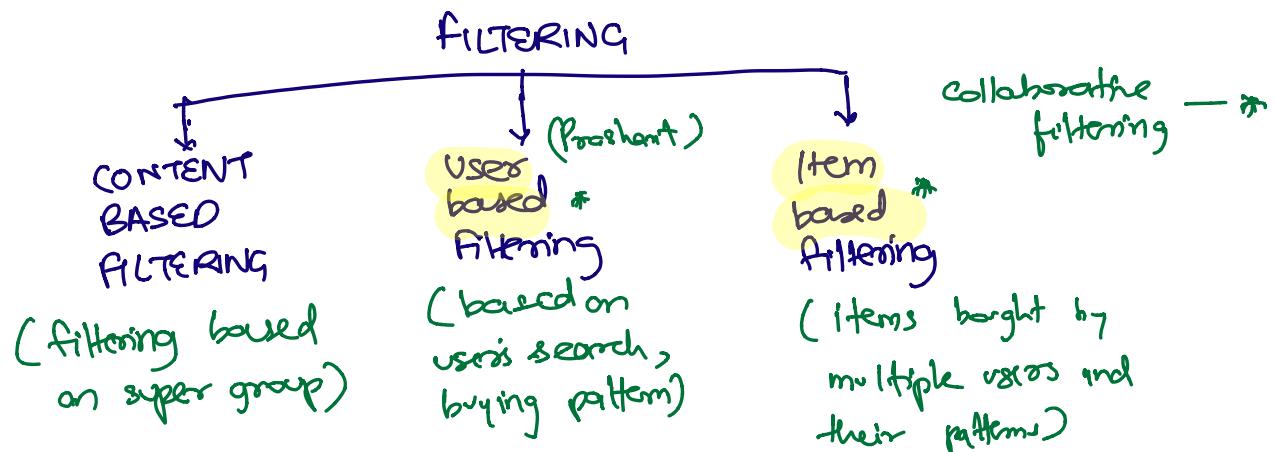
Unny → Samsung Headsets, iPhone XR, OnePlus 6T

Sridam → Machine Learning using Hadoop, Spark Python



for a good recommendation engine, you need to have the following

- ① Lots and Lots of Data (To create associations)
- ② Decide the type of filtering to use.



① Decide algo.

- ① Distance based algo      (content based)  
(Euclidean, Manhattan)  
filtering
  - ② Similarity Test  
(cosine similarity, correlation similarity)  
pearson correlation
  - ③ matrix factorization
- Collaborative filtering*

user id	1	2	3	...	n
movie id	1	2	3	...	n
1	5.5				
2		NAN			
3				.	
:					

ratings