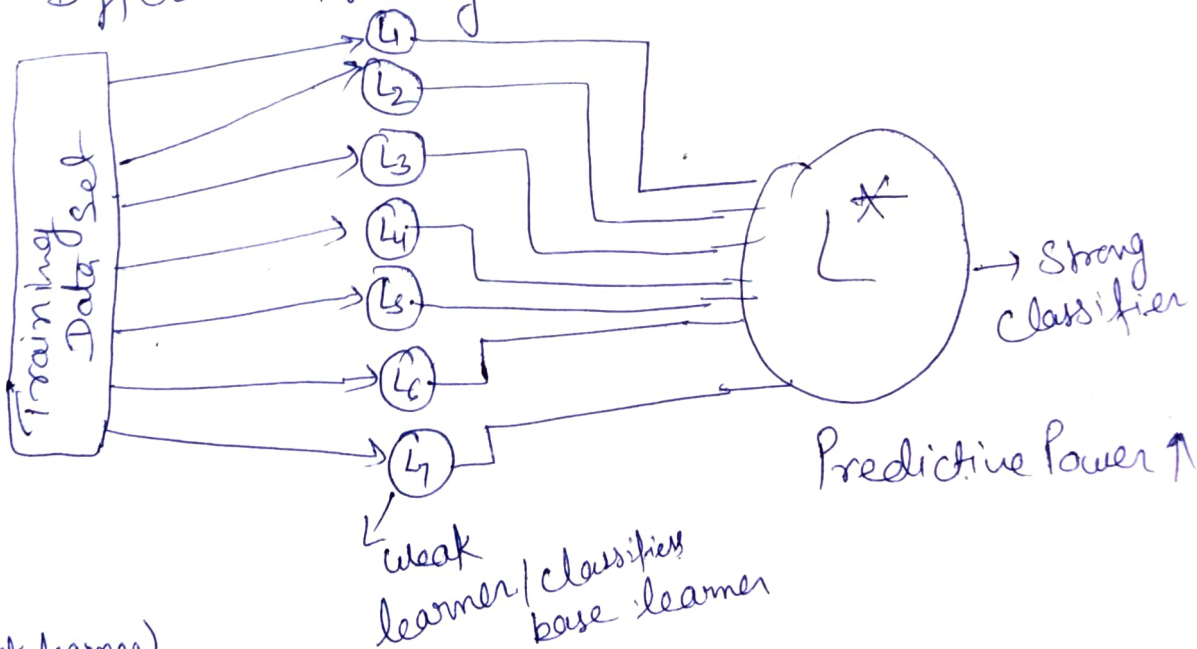
Ensemble learning →

In Ensemble learning we will Combine the output of multiple classifier in order to get better Prediction and or classification accuracy.

And under Conditions, Where the classifier output are independent of Each other and make Errors in an independent Manner, it is possible that by Combining the output of several classifier. we get a resulting classifier which is better than any of the Constituant classifier.

→ Different algorithm
→ Different Training data set

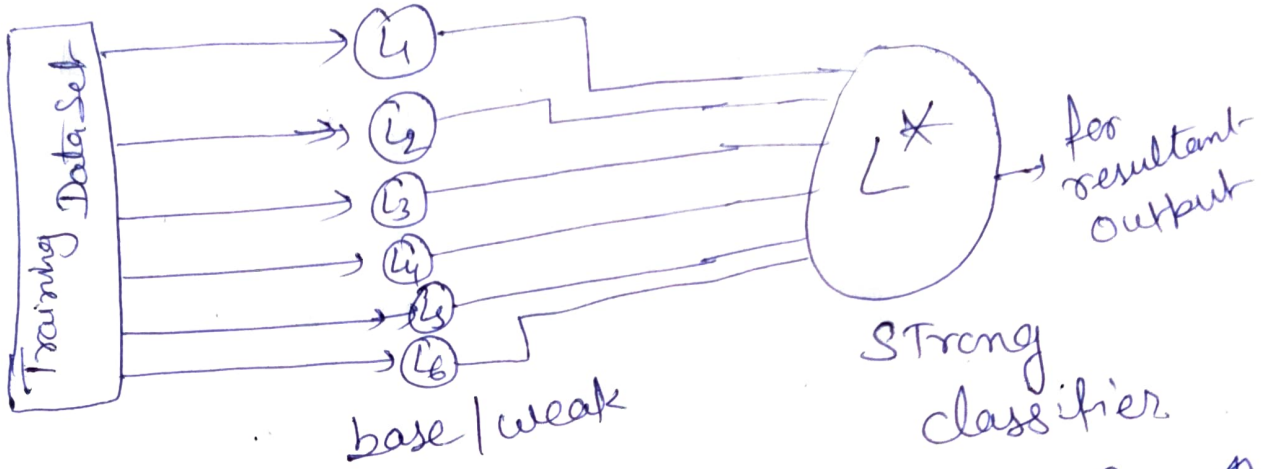


(weak learner)
they Can use different algorism to maintain the diversity of their output.

this is called Heterogeneous Ensemble because all base learnes are using different - diffenent algorithm.

if all base learners use same algorithm
diversity of output will be low.

To get diversity we can use different data set for each base learner



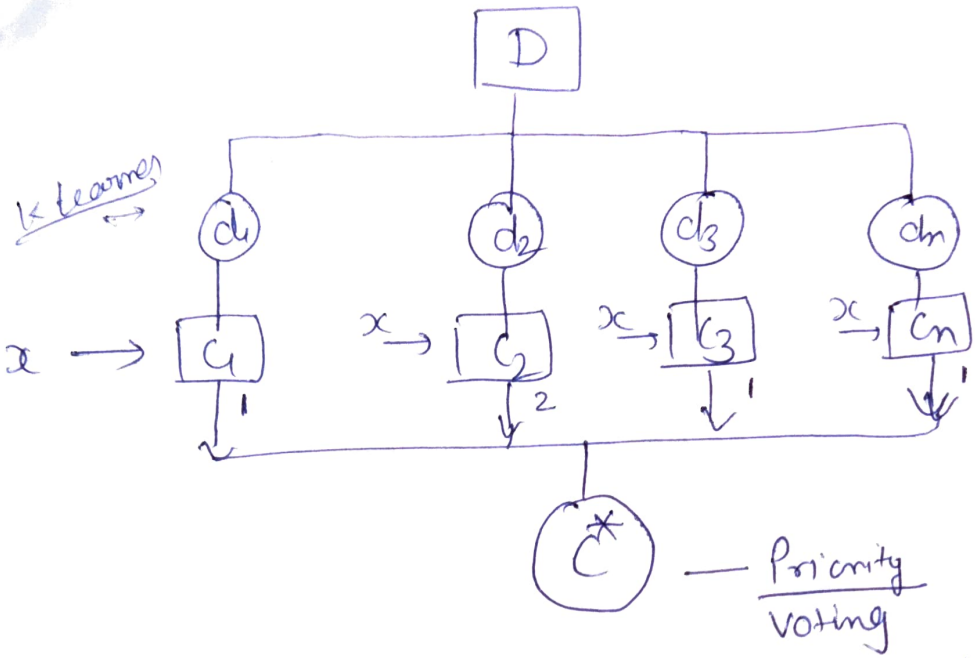
Predictive Power ↑
Accracy ↑
Precision ↑
Error Rate ↓

Two Different Ensemble learning Methods

1) Bagging 2) Boosting.

Bagging → It is also known as Bootstrap aggregation.

· first of all the samples are generated such that the samples are different from Eachother. we sample D_1 D_2 D_3 -- D_k these are different Data Subset which is sampled from Original Data. They may have same in Common



but they also will have different values.

To get di Draw Random Sample with replacement..

for Example

if we desire Each of these Di we will have m Examples we randomly draw m Samples from D with replacement ~~me~~ that is we Can have the Same instance repeated several times and Some instances may not appear in a particular Di and so these Di Can be different..

we use bagging technique for these k learners and train a base learner with Each and Combine the output by voting.