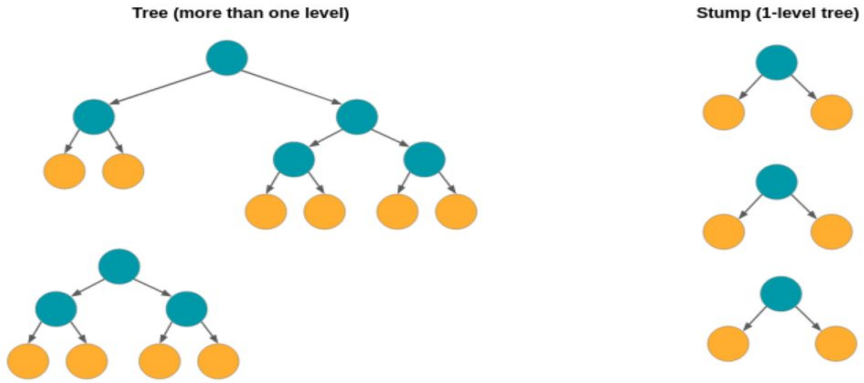
# Boosting Algorithms in Machine Learning

# Boosting :

- Boosting is a method used in machine learning to reduce errors. A single machine learning model might make prediction errors depending on the accuracy of the training dataset.
- For example, if a dog-identifying model has been trained only on images of white dogs, it may occasionally misidentify a black dog.
- Boosting tries to overcome this issue by training multiple models sequentially to improve the accuracy of the overall system.
- Boosting improves machine models' predictive accuracy and performance by converting multiple weak learners into a single strong learning model

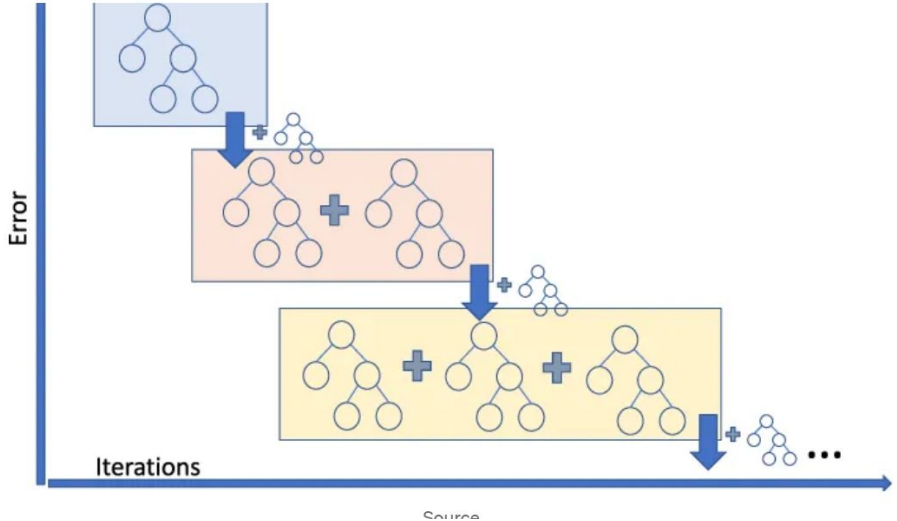
# Ada Boosting




An AdaBoost regressor is a meta-estimator that begins by fitting a regressor on the original dataset and then fits additional copies of the regressor on the same dataset but where the weights of instances are adjusted according to the error of the current prediction

In Adaboost Stumps (a node with two leaves) are created

# Gradient Boosting




- Gradient Boosting (GB) is similar to AdaBoost in that it, too, is a sequential training technique. The difference between AdaBoost and GB is that GB does not give incorrectly classified items more weight.
- Instead, GB software optimizes the loss function by generating base learners sequentially so that the present base learner is always more effective than the previous one.
- This method attempts to generate accurate results initially instead of correcting errors throughout the process, like AdaBoost.