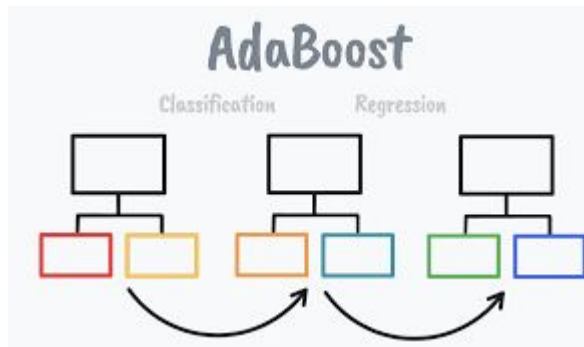# BOOSTING ALGORITHM

ADA BOOST

AdaBoost stands for **Adaptive Boosting**. It's a machine learning technique that **combines multiple simple models** (called **weak learners**) to create a **stronger model**.

It combines multiple weak models to get a strong model.

Class:

```python
from sklearn.ensemble import AdaBoostRegressor
```
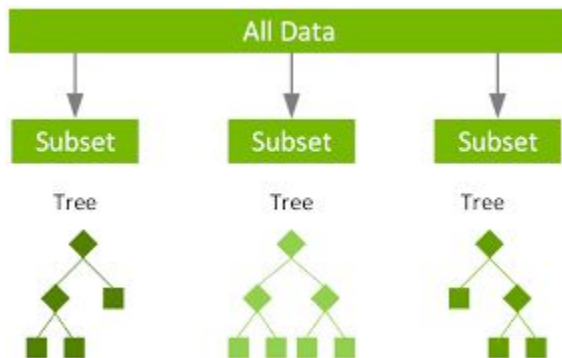
Xg boost

XGBoost stands for Extreme Gradient Boosting.

It's a powerful, fast, and accurate machine learning algorithm based on boosting, just like AdaBoost — but much smarter and optimized

First it creates a simple model and it finds the errors based on the errors it Builds a **new model to fix those mistakes**.Learns **how much to correct**, using **gradient descent**

LG BOOST

LightGBM is a super-fast, high-performance version of **gradient boosting** made by Microsoft.

It's designed to **handle large datasets** and **train faster** than traditional boosting methods like XGBoost.

First create a model. At first, they make some mistakes.

So you guide them step-by-step to focus on what they got wrong (just like gradient boosting).

But now, instead of checking each data point **one by one**, they:

- Group similar data points into **bins** (like rounding off numbers).

- Focus only on **important features** early on.

LightGBM leaf-wise