DATE : 12.12.2024

DT/NT :

LESSON : MACHINE LEARNING

SUBJECT: RANDOM FOREST

BATCH : 270

DATA SCIENCE

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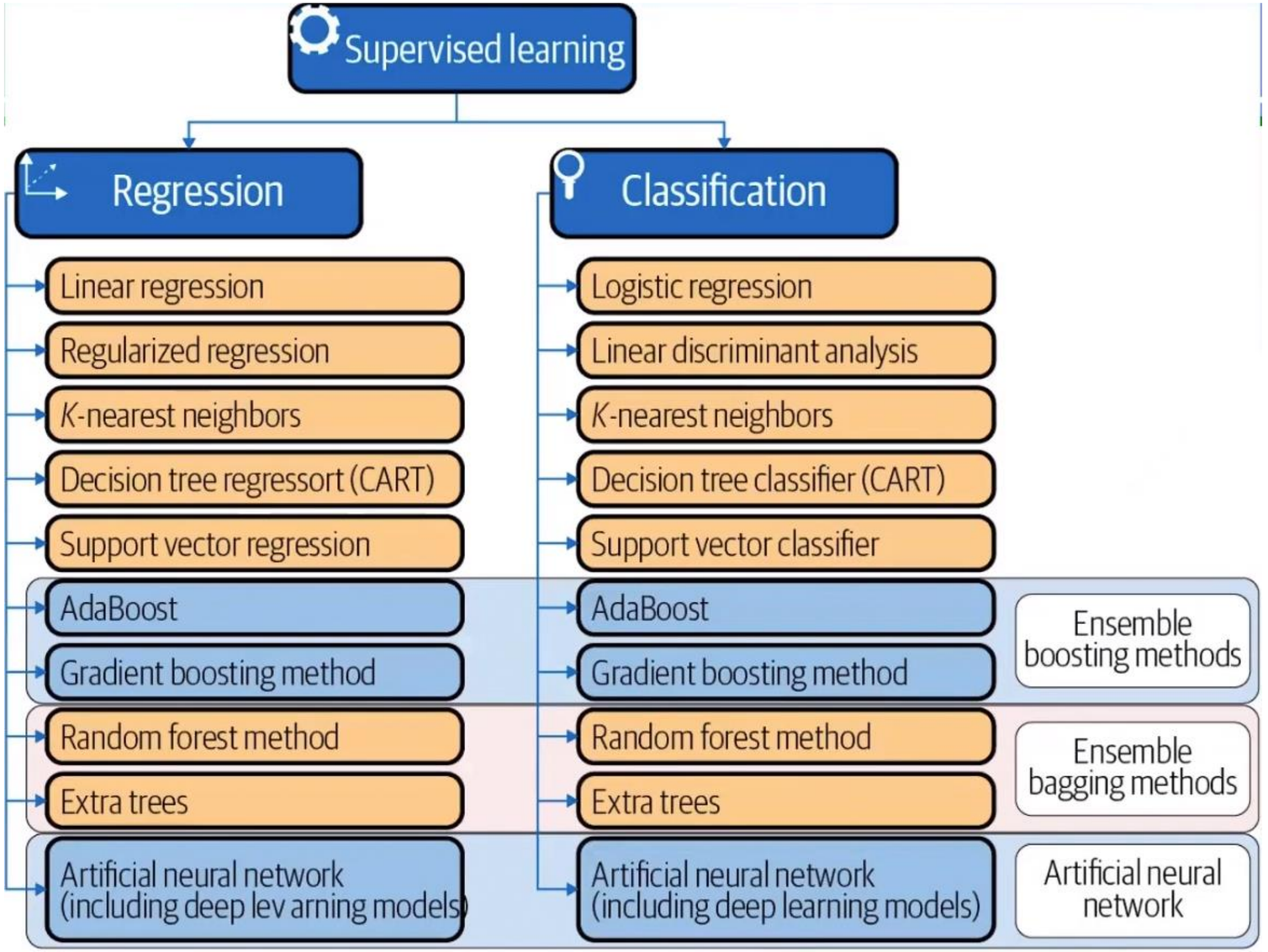
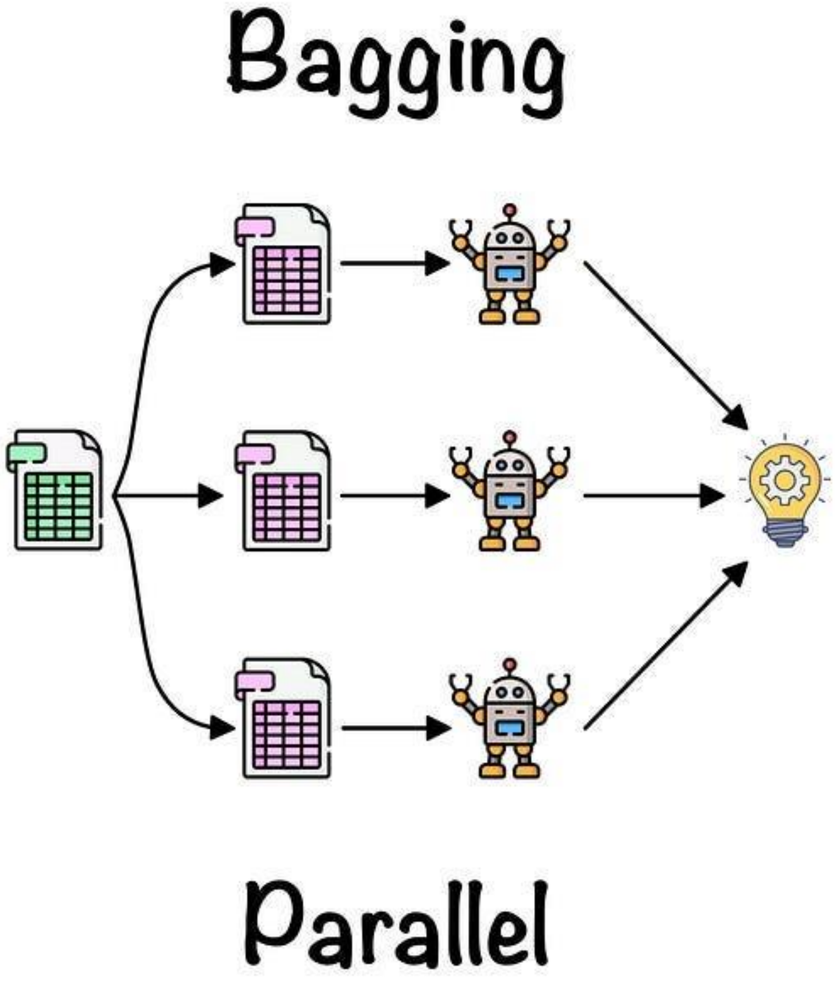
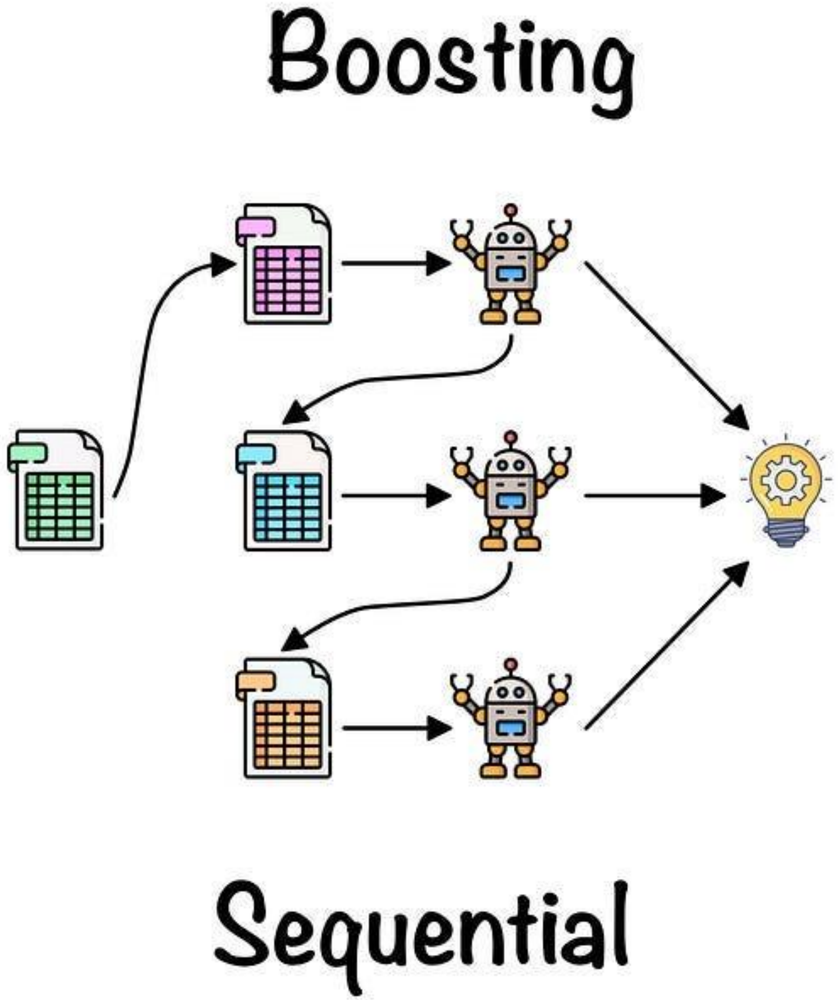
Where We Are?


Supervised learning
Regression
Classification
Linear regression
Regularized regression
K-nearest neighbors
Decision tree regressort (CART)
Support vector regression
AdaBoost
Gradient boosting method
Random forest method
Extra trees
Artificial neural network (including deep lev arning models)
Logistic regression
Linear discriminant analysis
K-nearest neighbors
Decision tree classifier (CART)
Support vector classifier
AdaBoost
Gradient boosting method
Random forest method
Extra trees
Artificial neural network (including deep learning models)
Ensemble boosting methods
Ensemble bagging methods
Artificial neural network

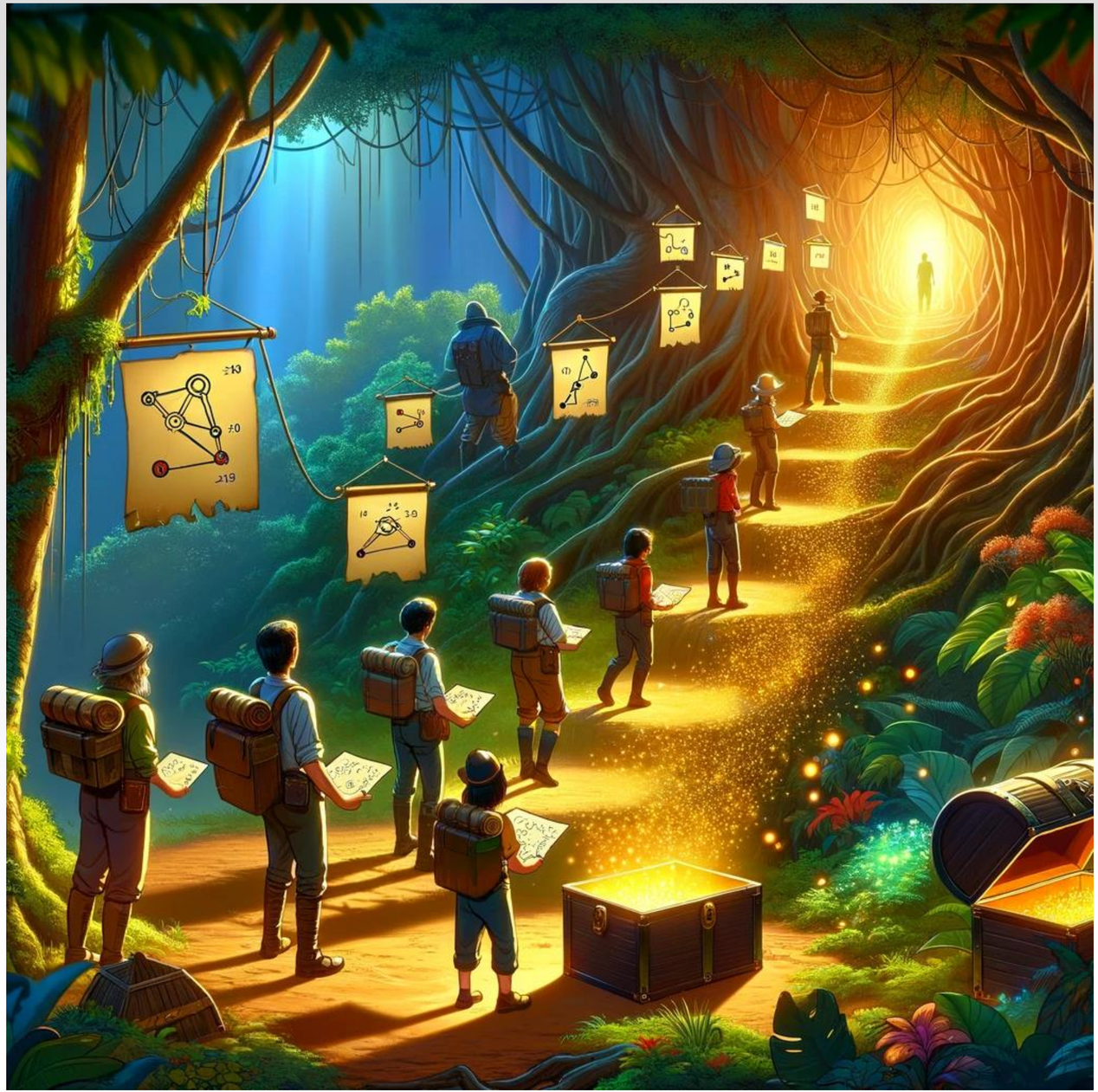
Ensemble Methods





Bagging (Bootstrap Aggregation)

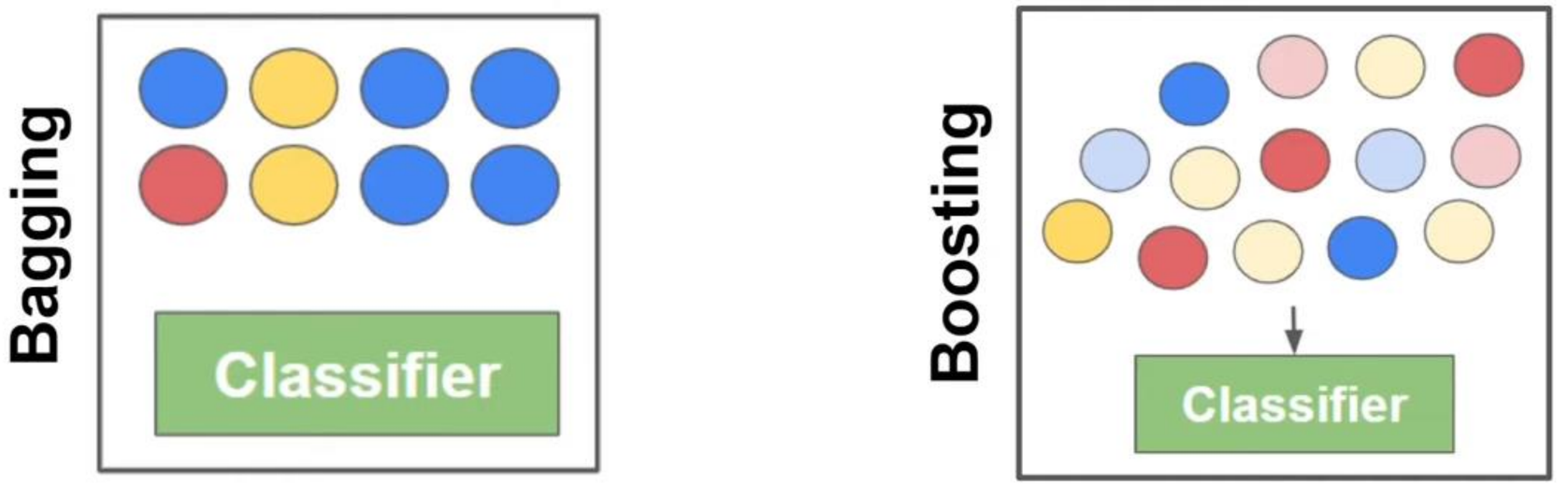
Boosting



Datasets

Both methods build a separate dataset for each model, but …

Subset | **Same Dataset**



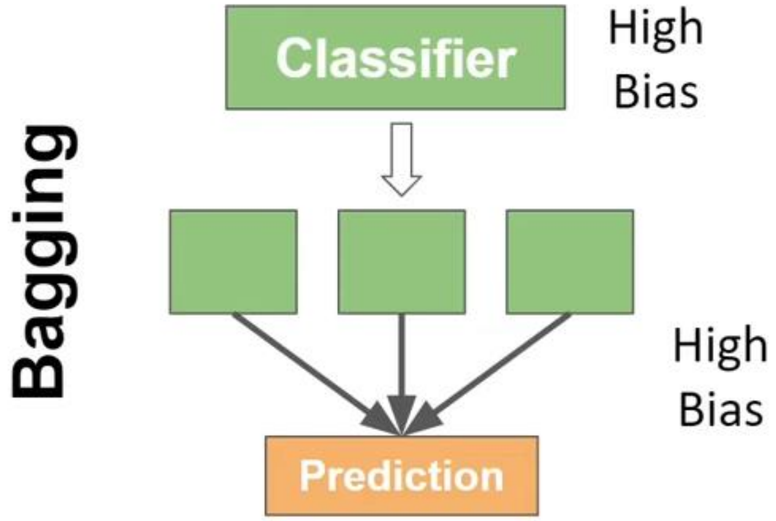
Predictions

Both methods make predictions by taking the average of the models, but …

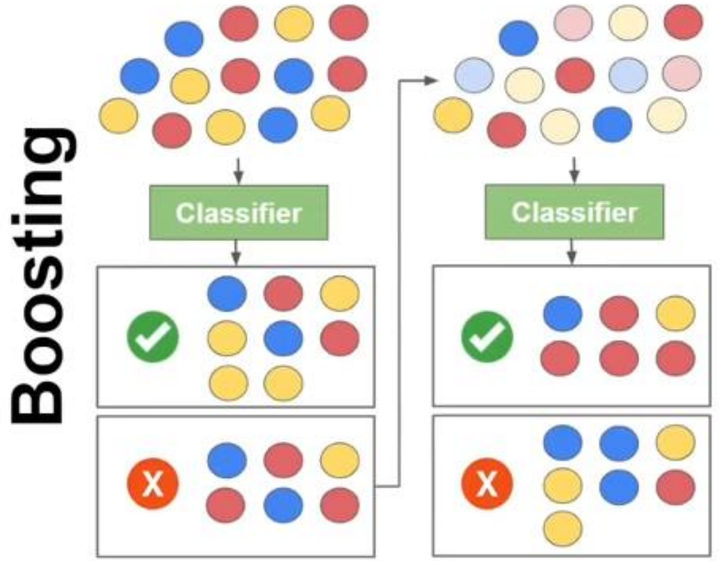
Bias And Variance

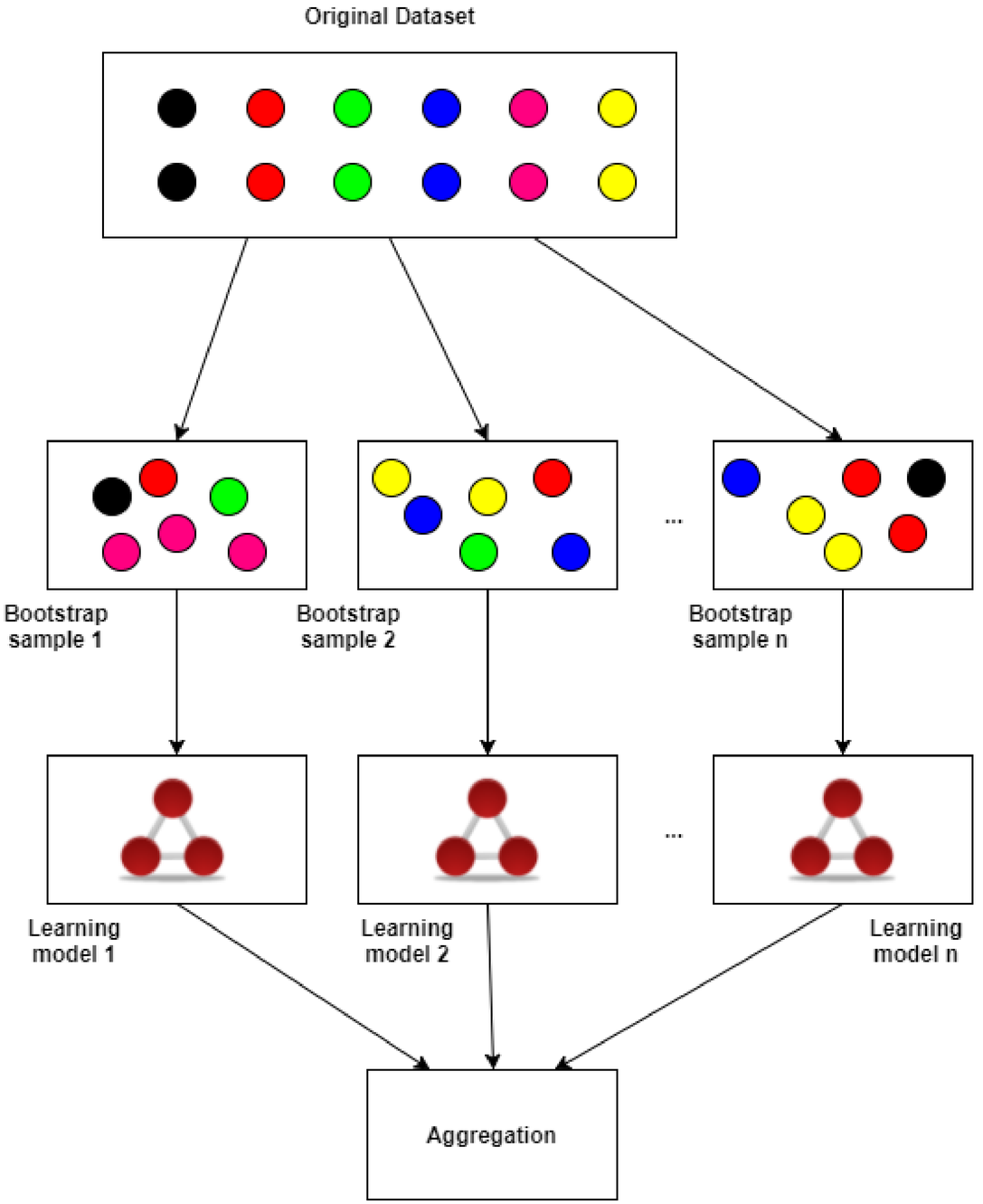
Both methods are good at reducing the variance, but …

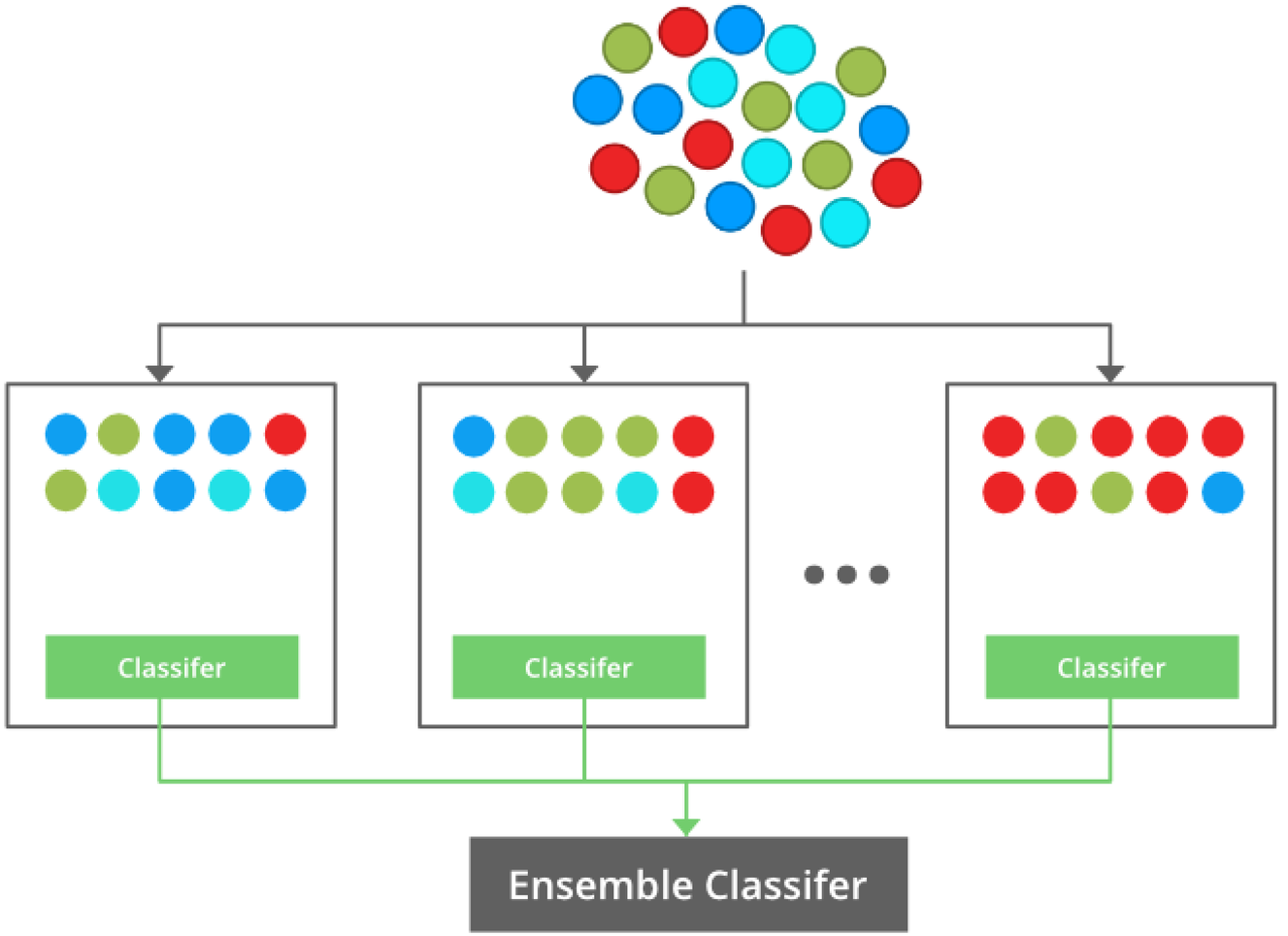
NO Bias Reduction



Bias Reduction




Original Dataset
Bootstrap sample 1
Bootstrap sample 2
...
Bootstrap sample n
Learning model 1
Learning model 2
...
Learning model n
Aggregation

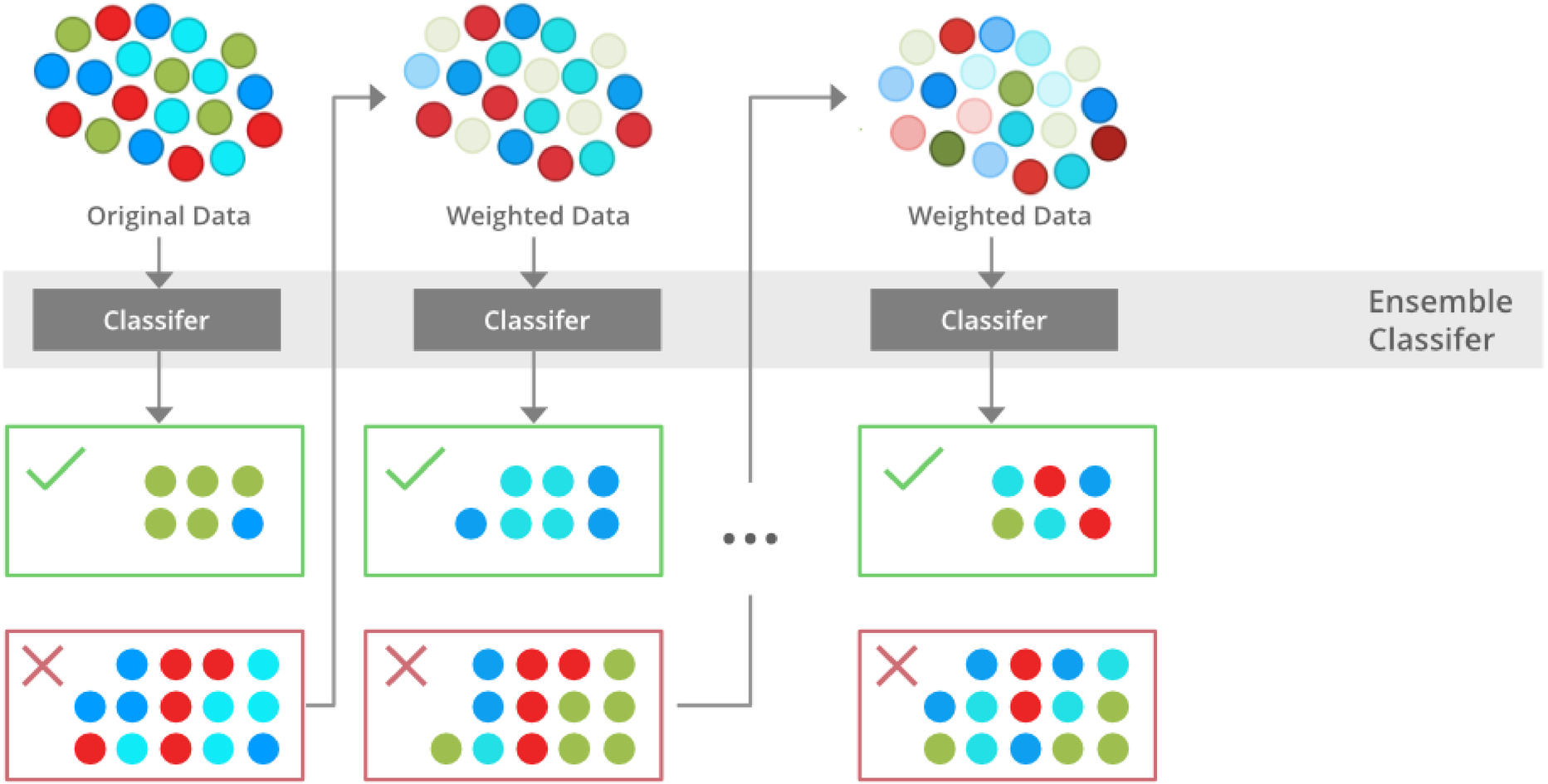


Original Data

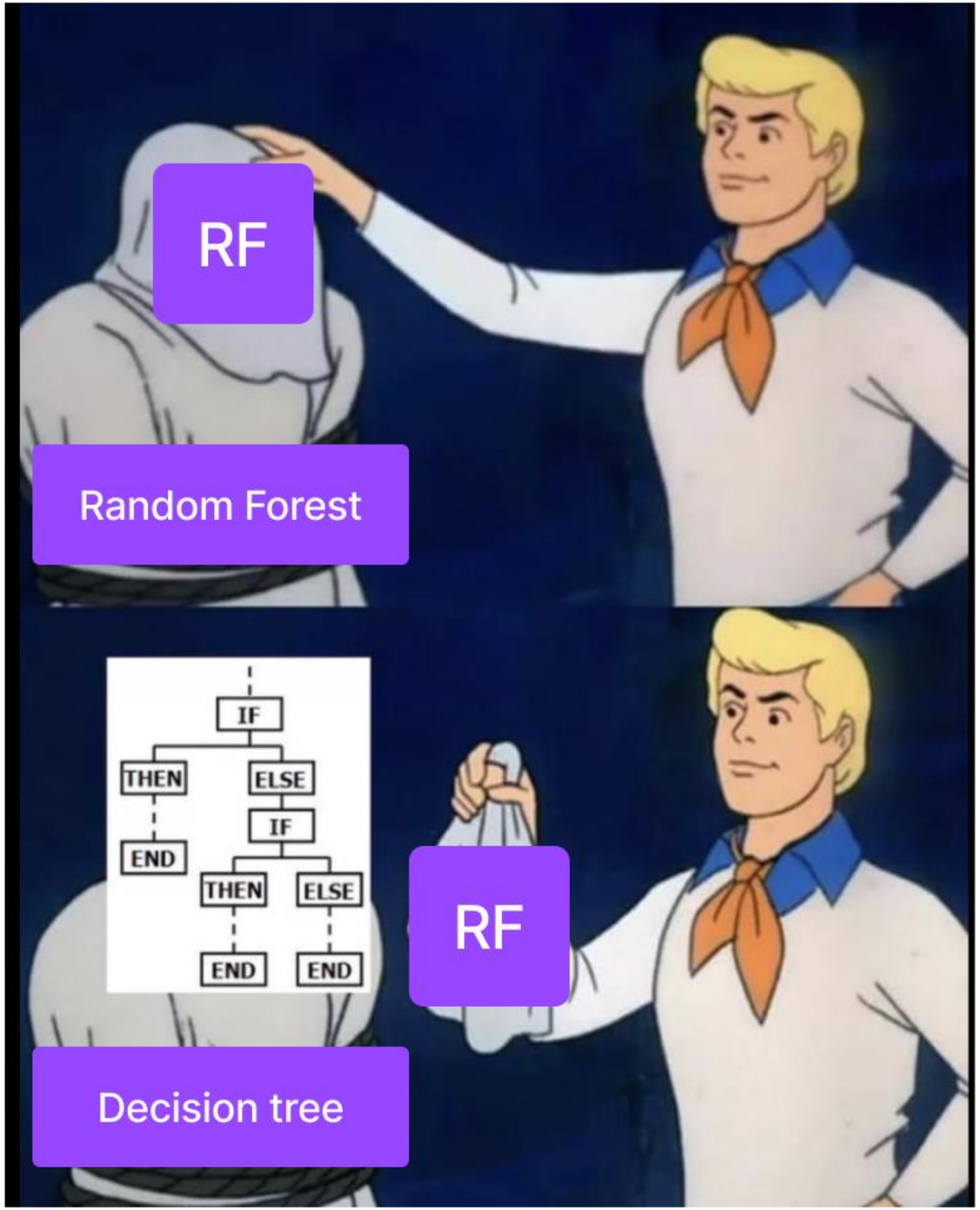
Bootstrapping

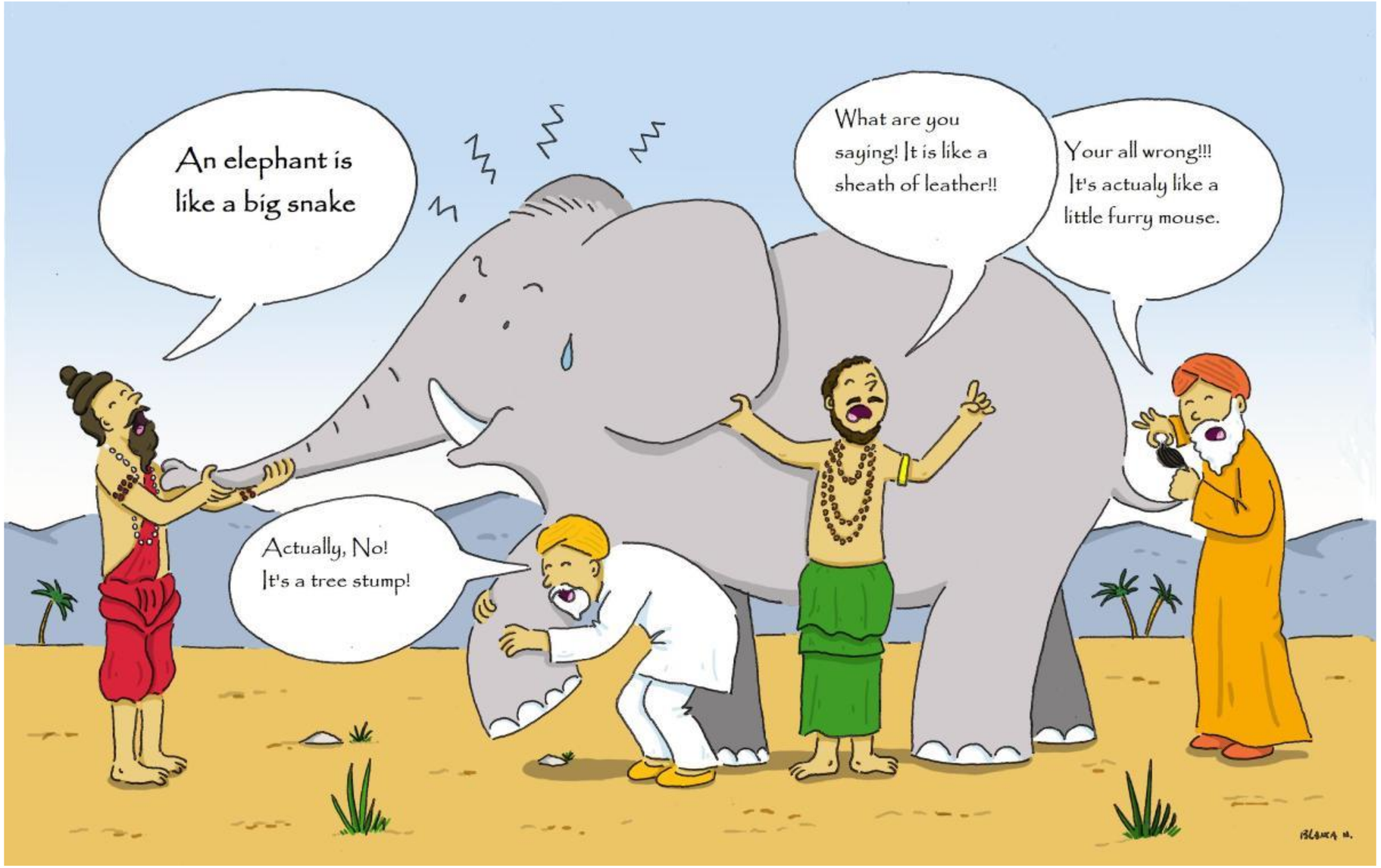
Aggregating

Bagging

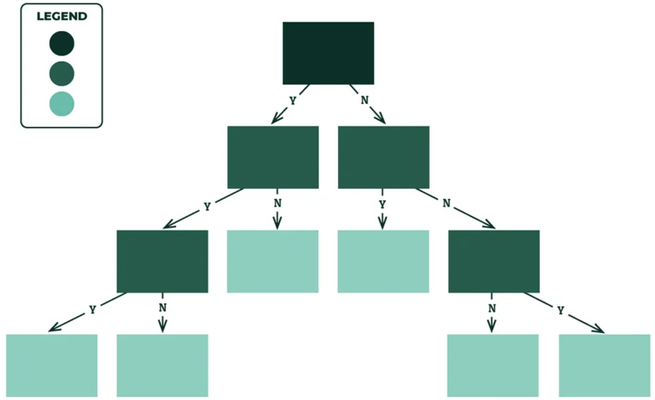

Original Data
Weighted Data
Weighted Data
Classifer
Classifer
Classifer
Ensemble
Classifer

RANDOM, FORREST, RANDOM!

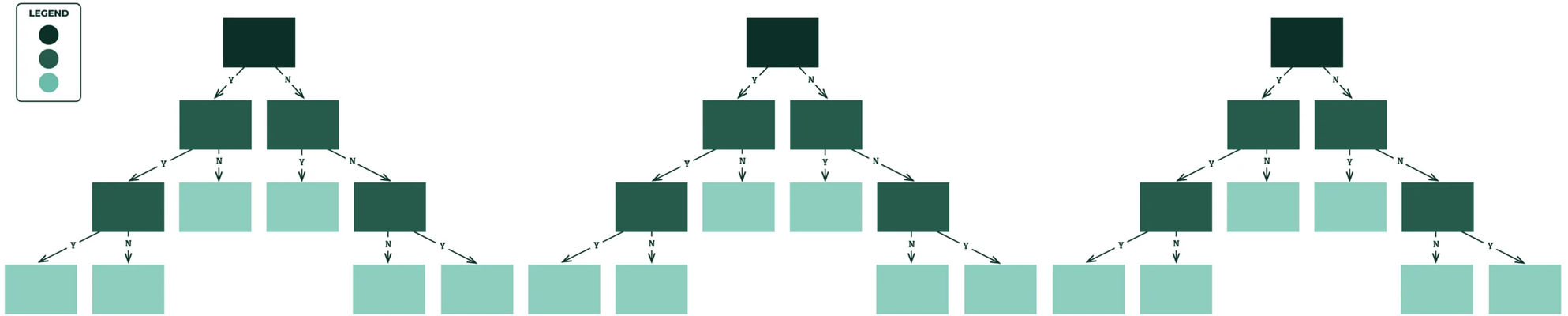

RF
Random Forest
IF
THEN
ELSE
IF
END
THEN
ELSE
END
END
RF
Decision tree

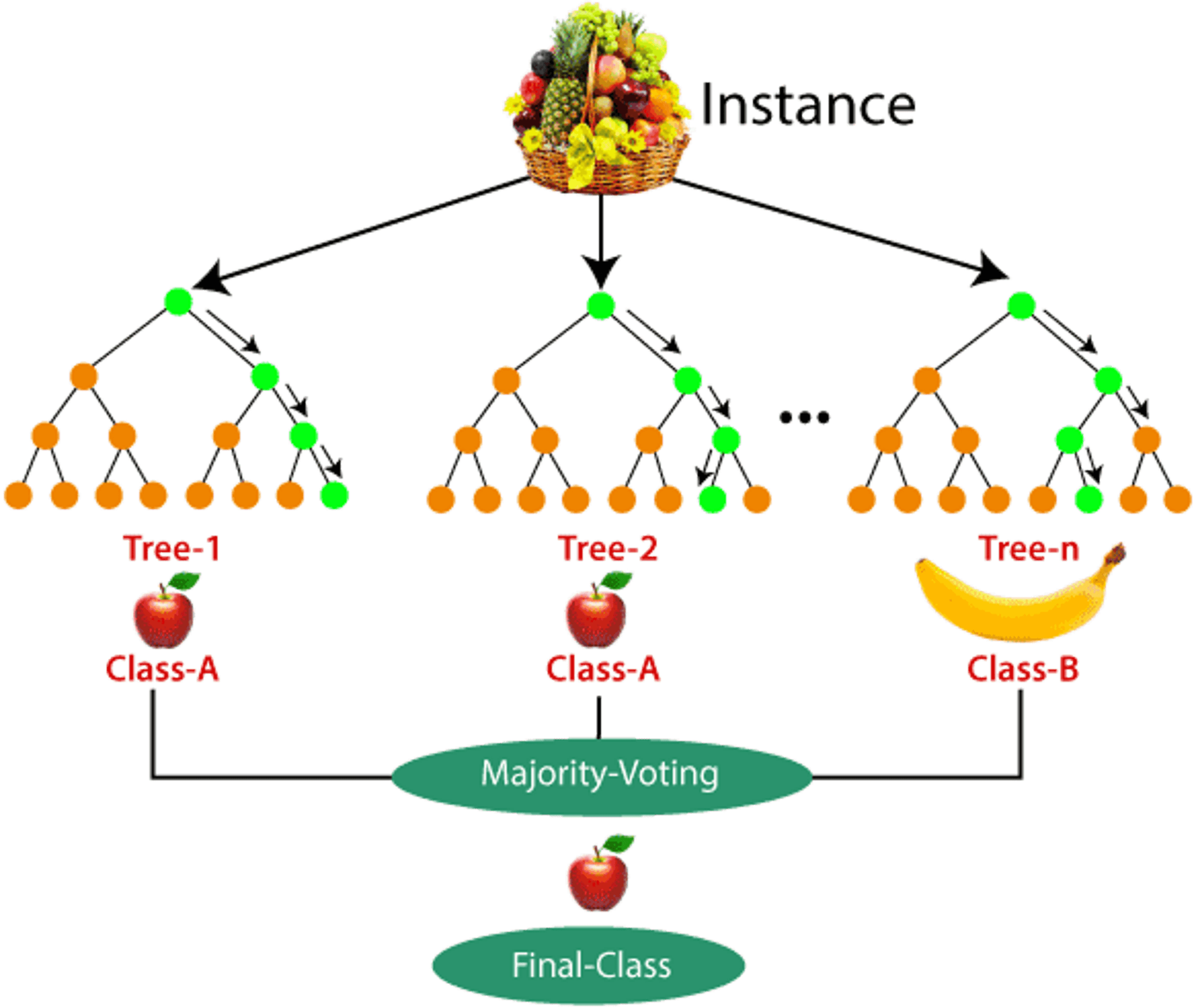

An elephant is like a big snake
Actually, No! It's a tree stump!
What are you saying! It is like a sheath of leather!!
Your all wrong!!! It's actualy like a little furry mouse.

DECISION TREE

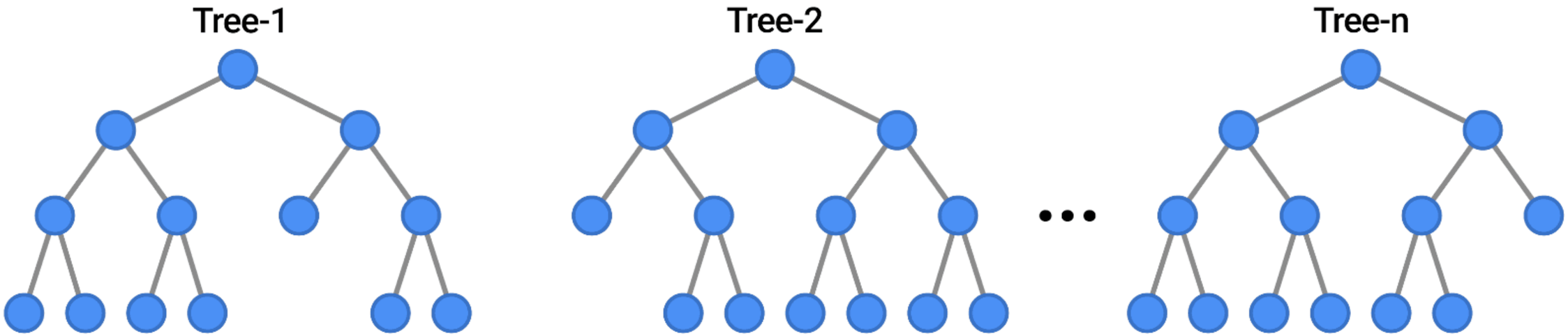


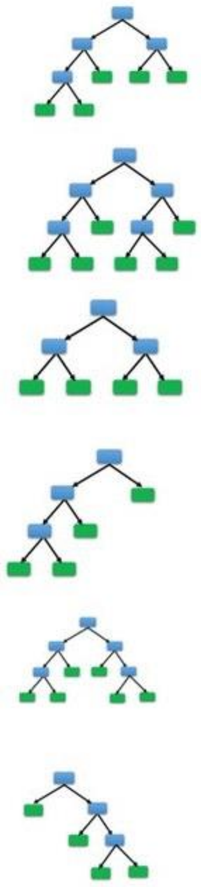
RANDOM FOREST




Instance
Tree-1
Tree-2
Tree-n
Class-A
Class-A
Class-B
Majority-Voting
Final-Class

EXAMPLES





Random Forest in Action!!!

Advantages of Random Forests

Robustness

Scalability

Easy to Use

00:00

Start Stop Reset mins: 10 secs: 0 type: None

Breaktime for PowerPoint by PixelSimulation Ltd. Show Settings