



Sam Rahbar

Random Forest

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Application of Random Forest



Remote Sensing

Used in ETM devices to acquire images of the earth's surface.

Accuracy is higher and training time is less



Object Detection

Multiclass object detection is done using Random Forest algorithms

Provides better detection in complicated environments



Kinect

Random Forest is used in a game console called Kinect

Tracks body movements and recreates it in the game

Application of Random Forest



Kinect

Random Forest is
used in a game
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Tracks body
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Application of Random Forest



User performs a step



Kinect registers the movement



Marks the user based on accuracy



Training set to identify body parts



Random forest classifier learns

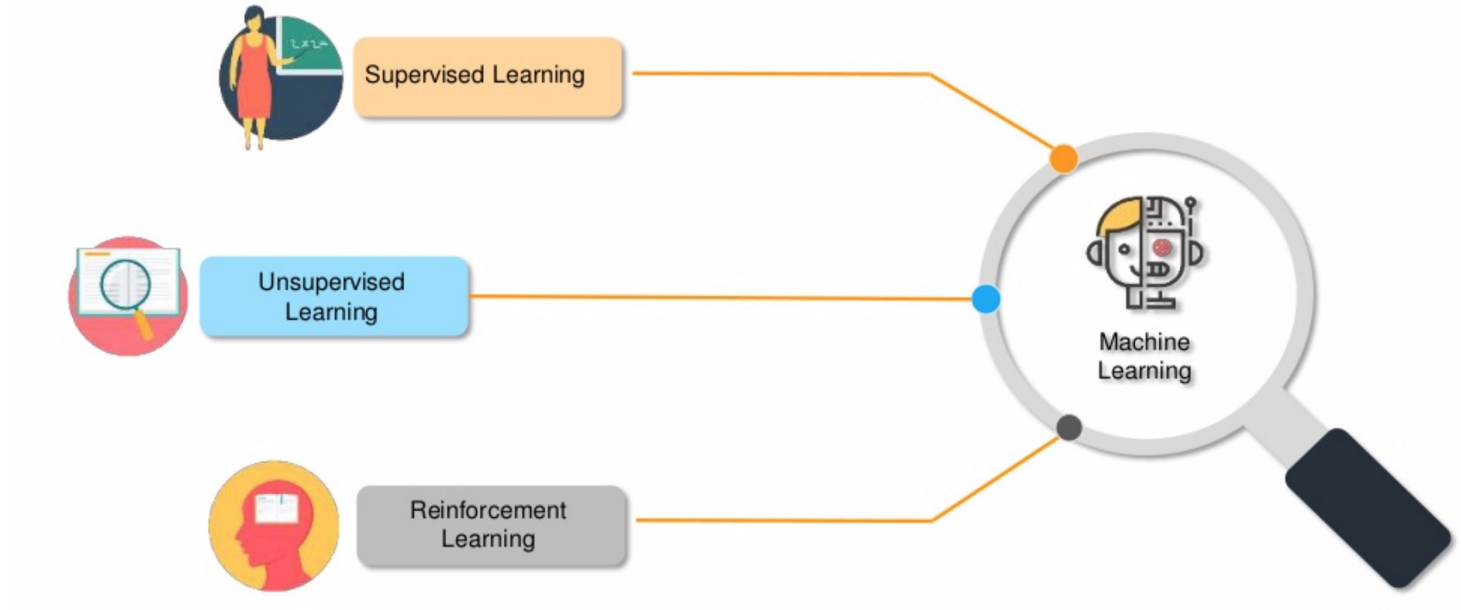


Identifies the body parts while dancing

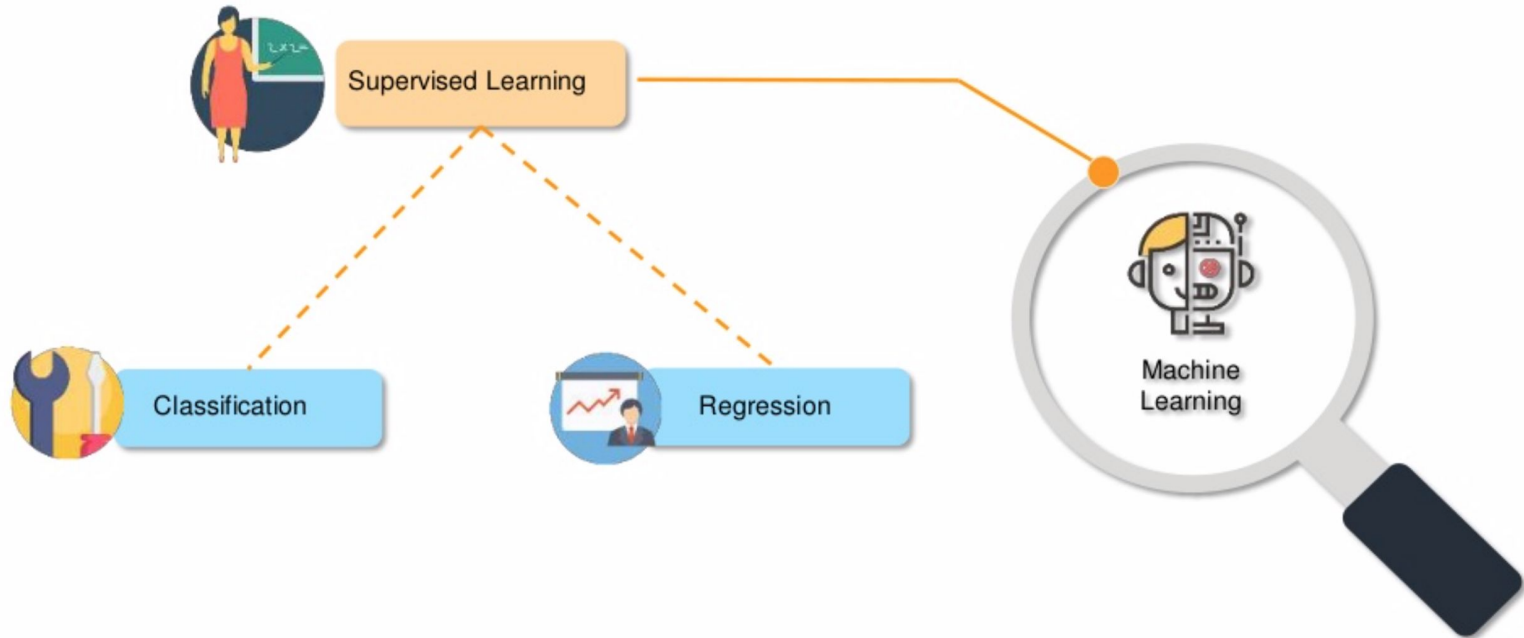


Score game avatar based on accuracy

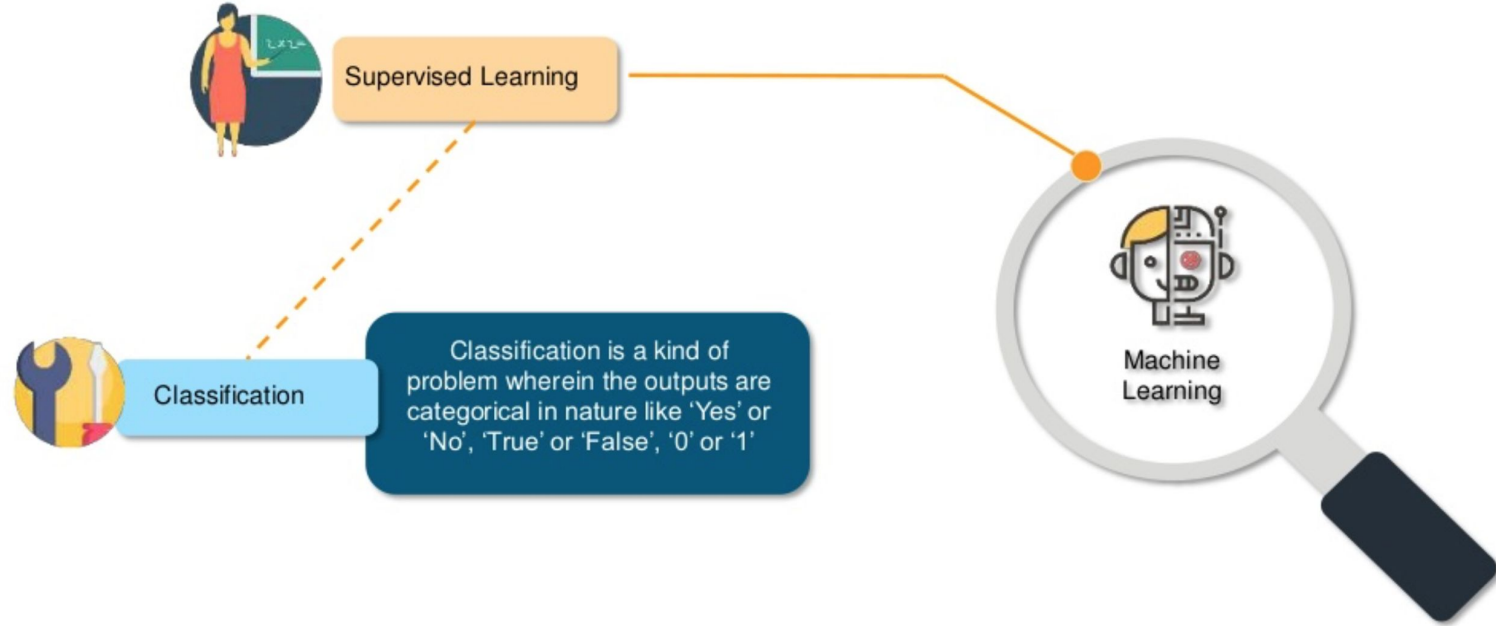
Types of Machine Learning



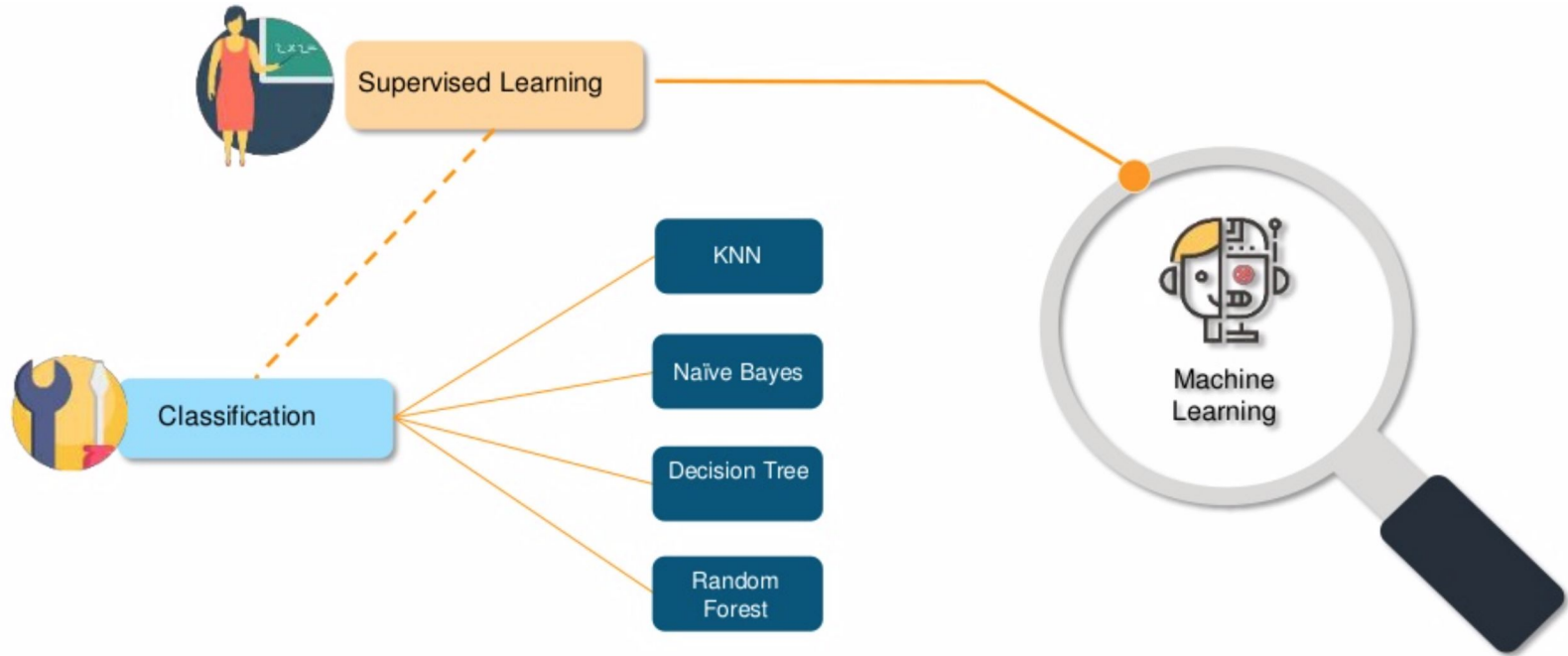
Types of Machine Learning



What is Classification?



Solutions Under Classification



Why Random Forest?



No overfitting

Use of multiple trees
reduce the risk of
overfitting

Training time is less



High accuracy

Runs efficiently on large
database

For large data, it
produces highly
accurate predictions



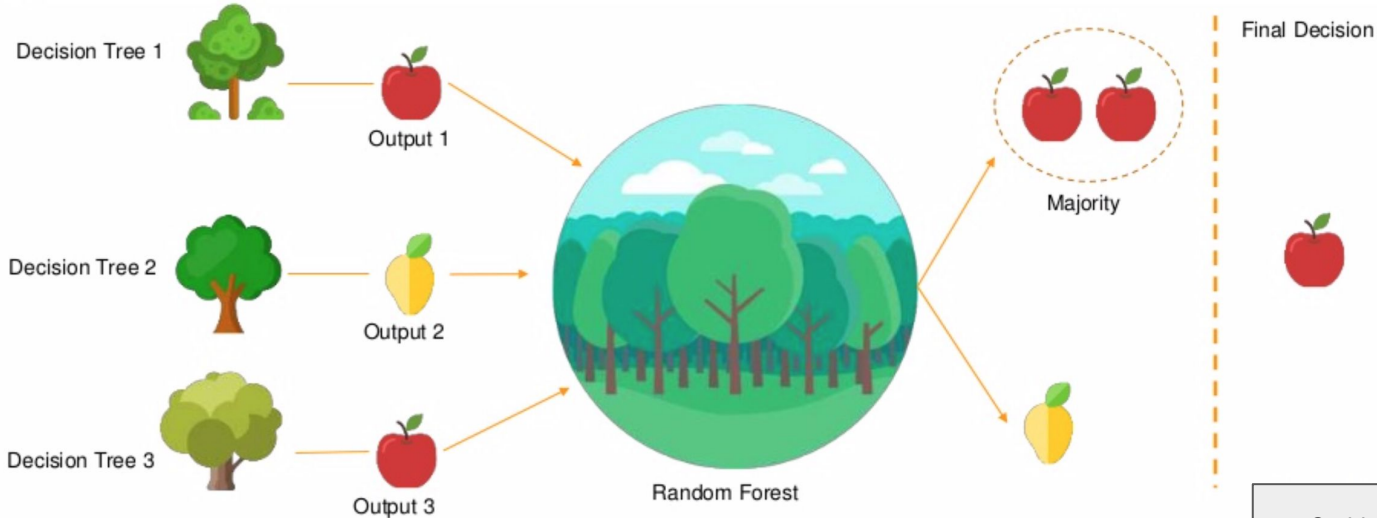
Estimates missing data

Random Forest
can maintain
accuracy when a
large proportion of
data is missing

What is Random Forest?

Random forest or Random Decision Forest is a method that operates by constructing multiple Decision Trees during training phase.

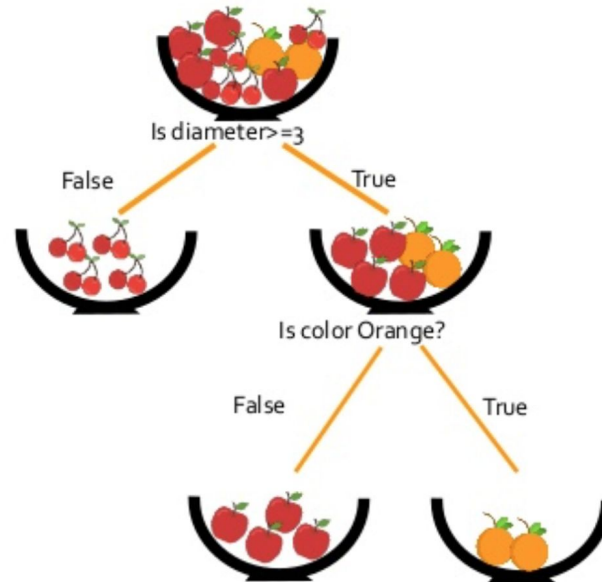
The Decision of the majority of the trees is chosen by the random forest as the final decision



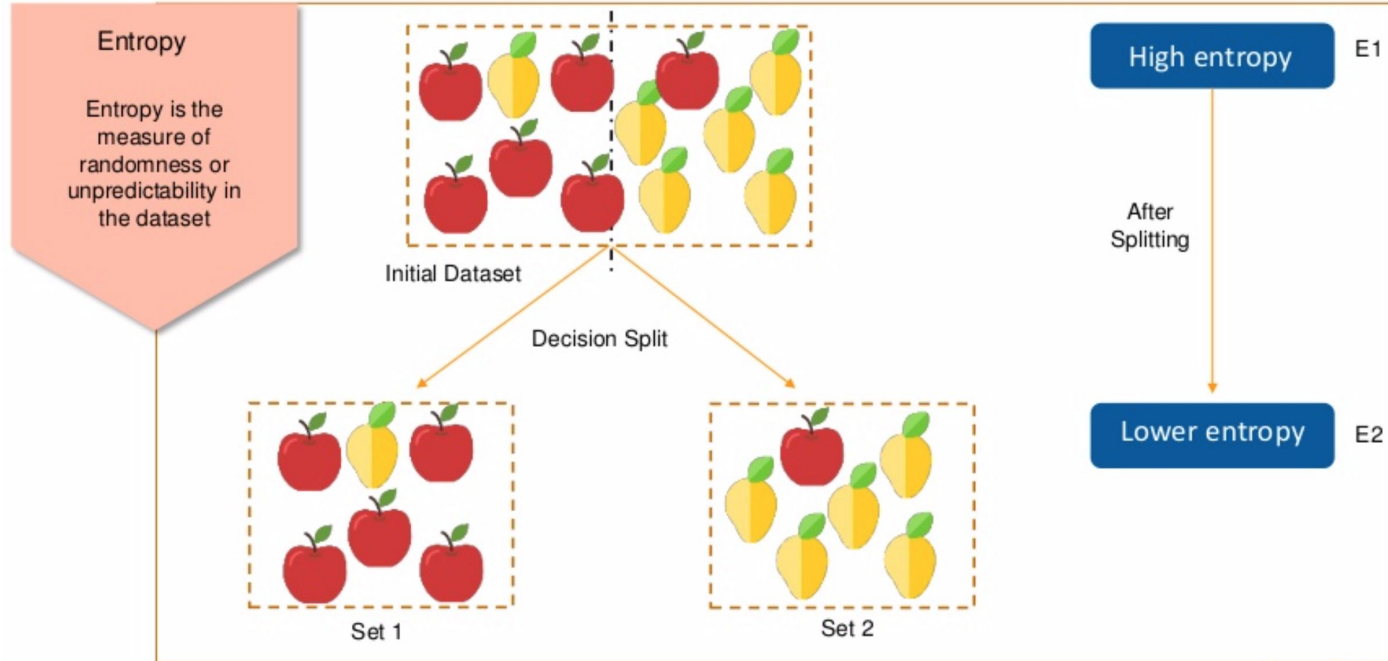
s: Srahbar.com

Random Forest and Decision Tree

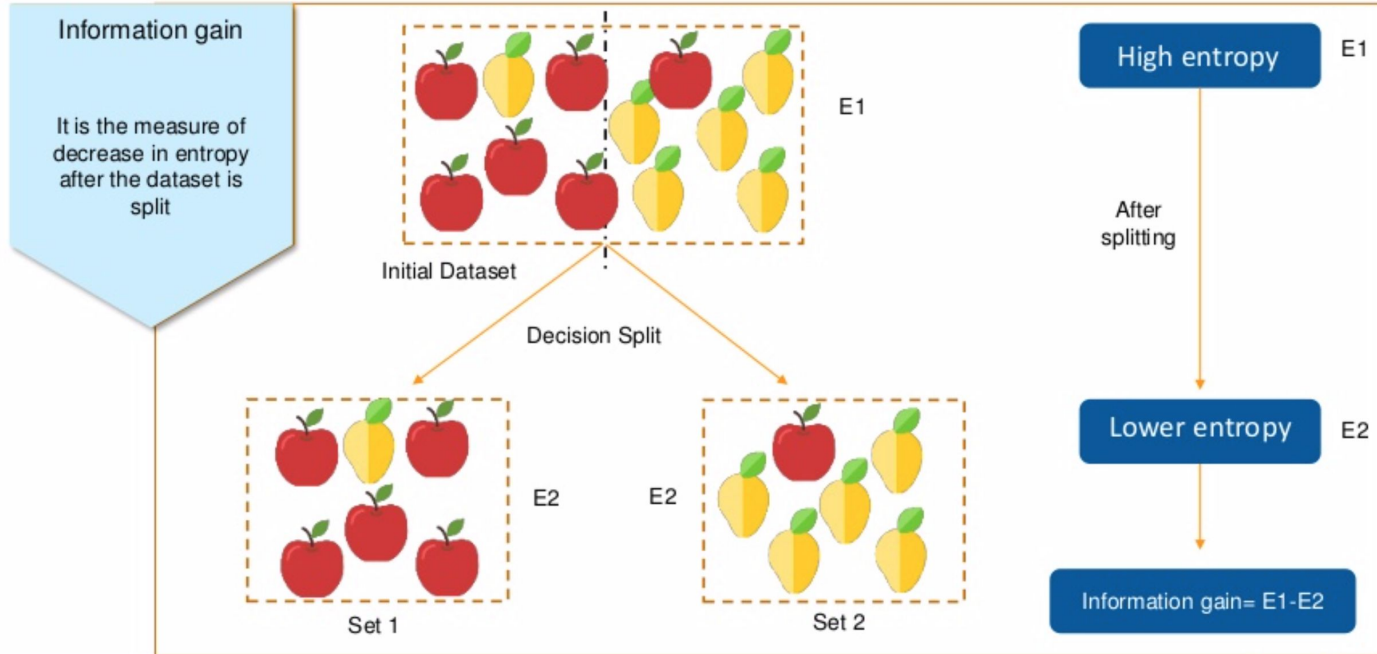
Decision Tree is a tree shaped diagram used to determine a course of action. Each branch of the tree represents a possible decision, occurrence or reaction



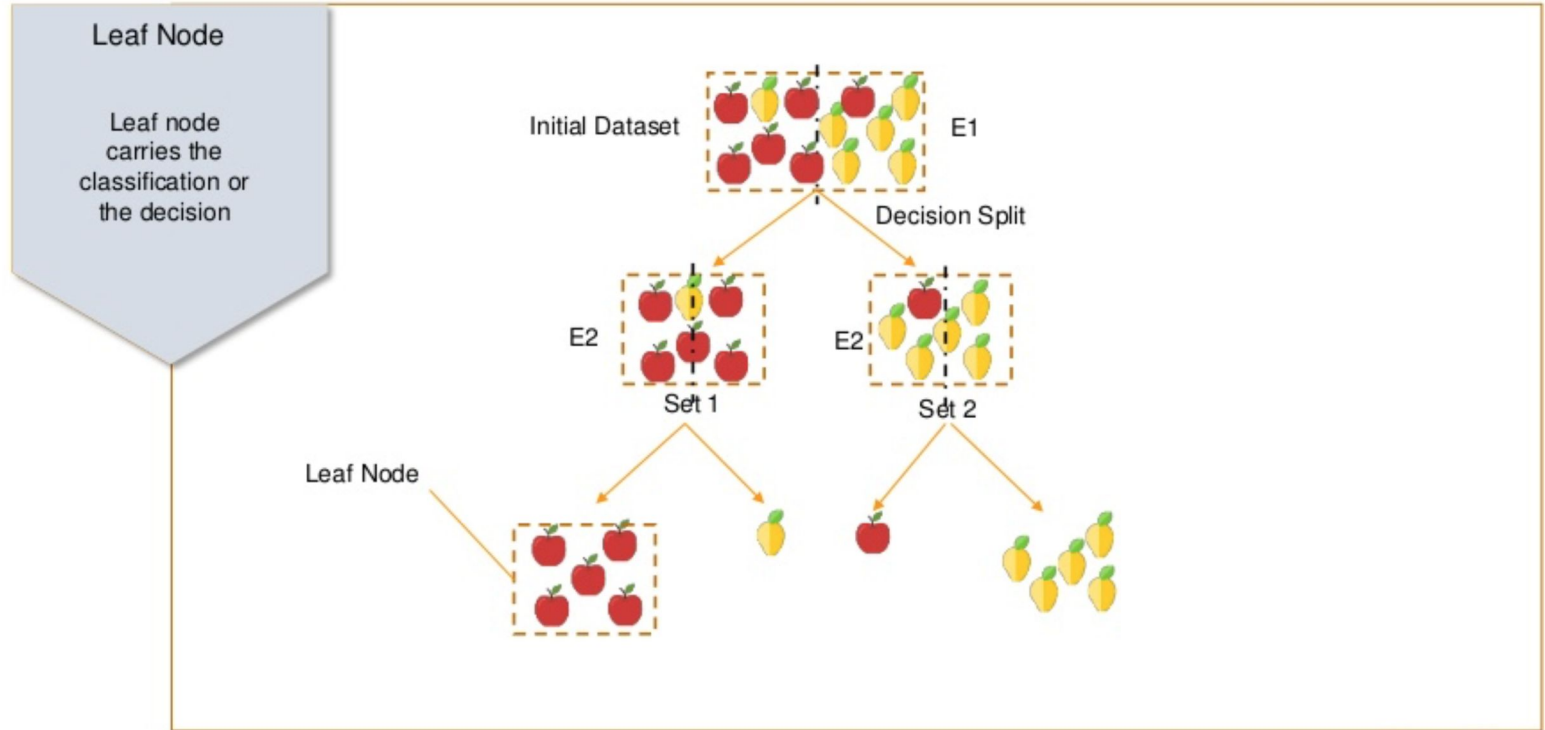
Decision Trees (Important Concepts):



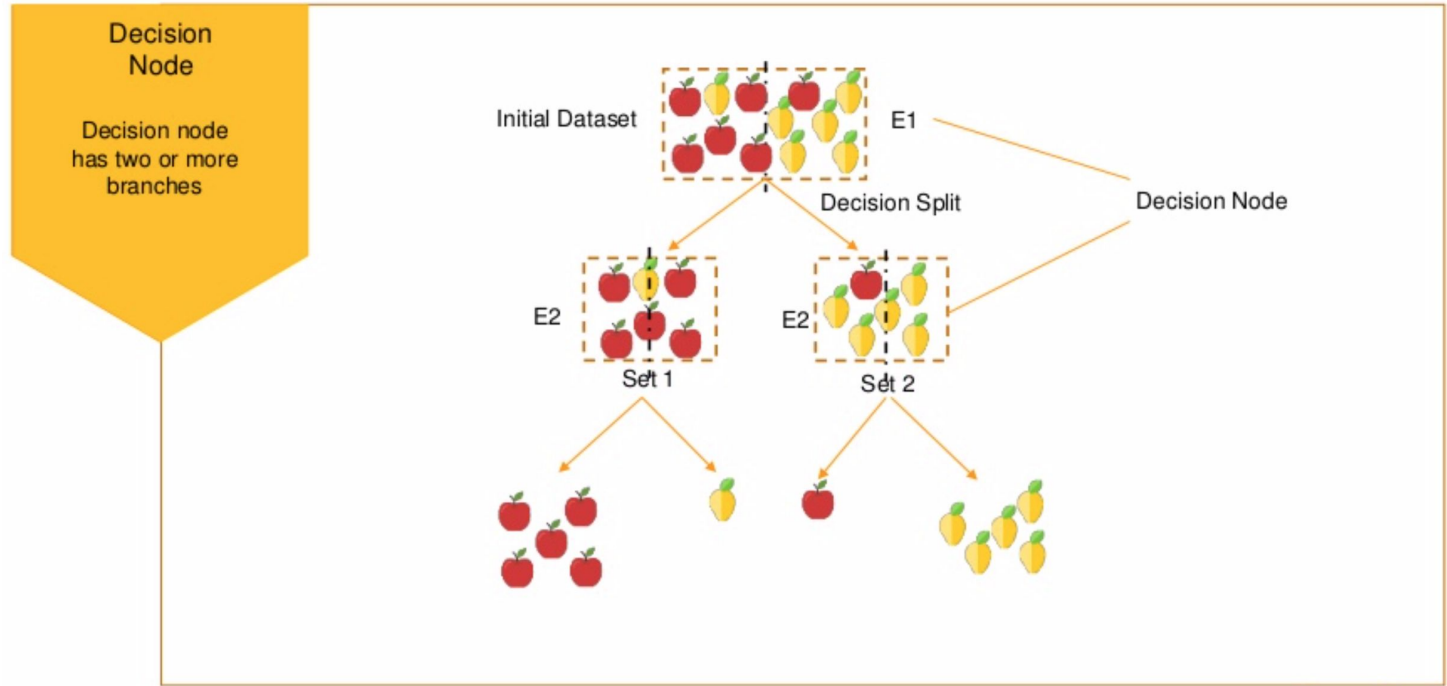
Decision Trees (Important Concepts):



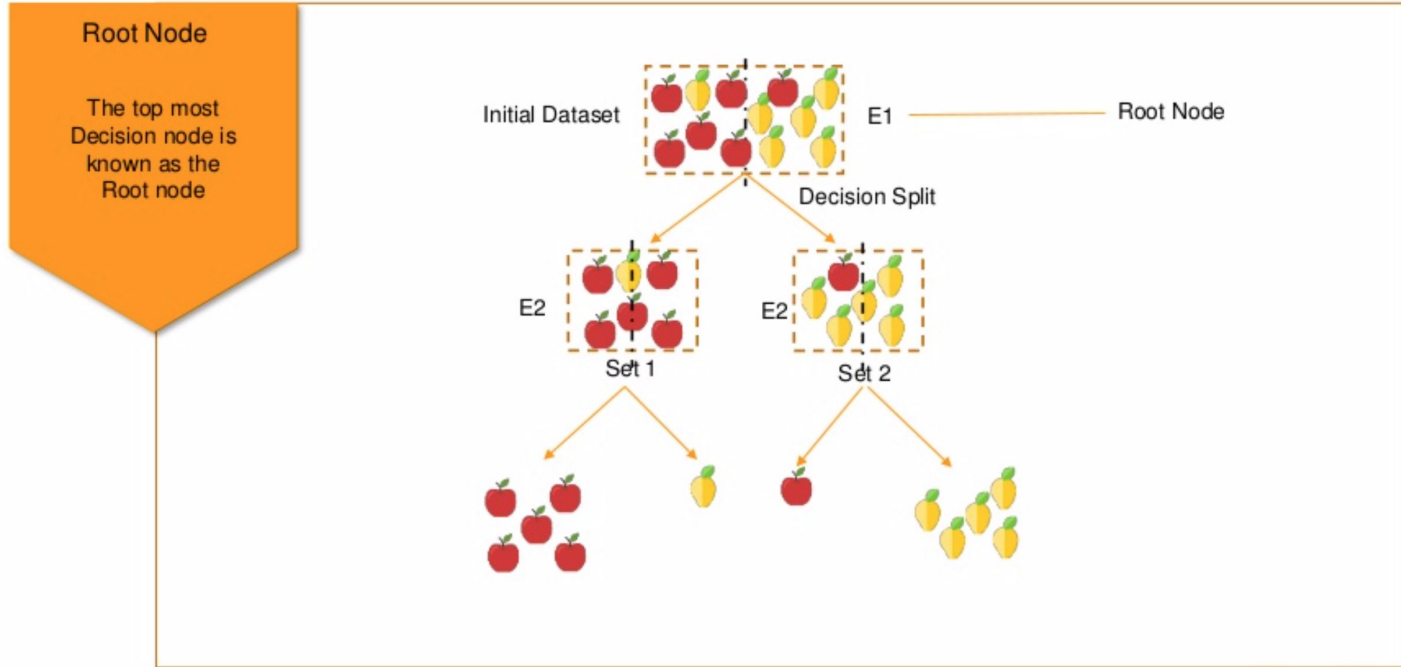
Decision Trees (Important Concepts):



Decision Trees (Important Concepts):



Decision Trees (Important Concepts):



How does a random forest work?

Problem statement

To classify the different types of fruits in the bowl based on different features



How does a random forest work?

Conditions

Color== purple?

Diameter=3

Color== Yellow?

Color== Red?

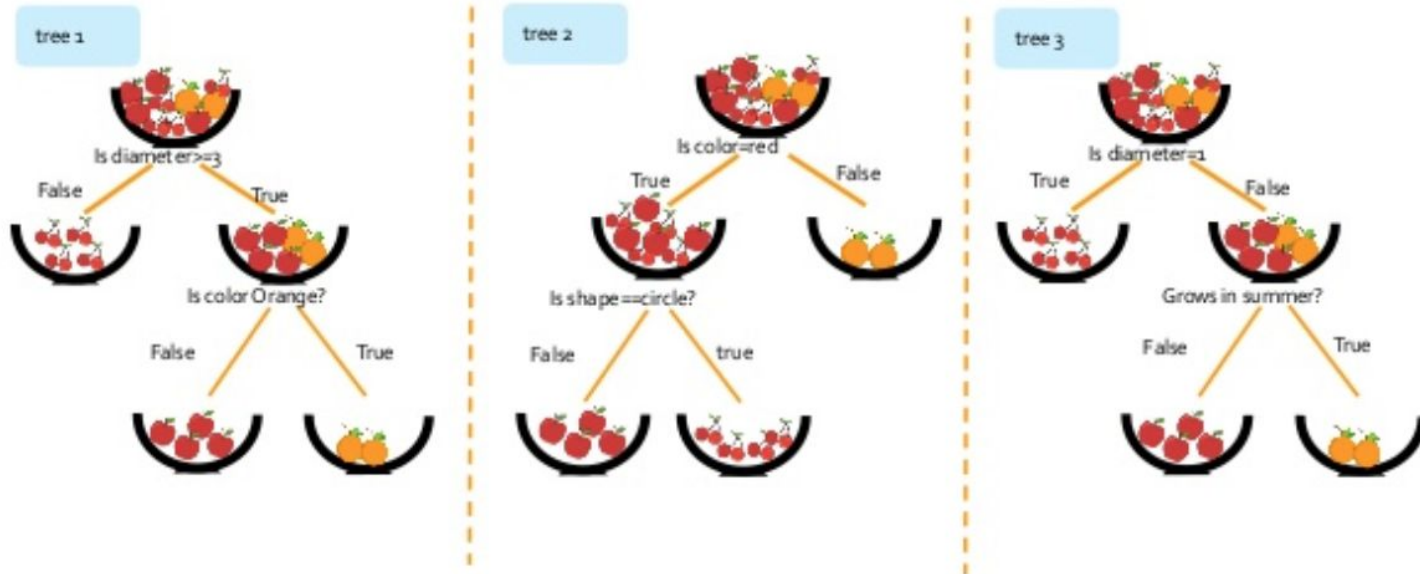
Diameter=1



Training Dataset

Color	Diameter	Label
Red	3	Apple
Yellow	3	Lemon
purple	1	Grapes
Red	3	Apple
Yellow	3	Lemon
purple	1	Grapes

How does a random forest work?



How does a random forest work?

Now Lets try to classify this
fruit

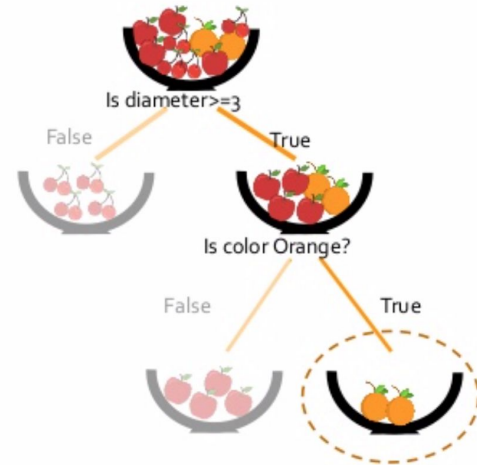


How does a random forest work?

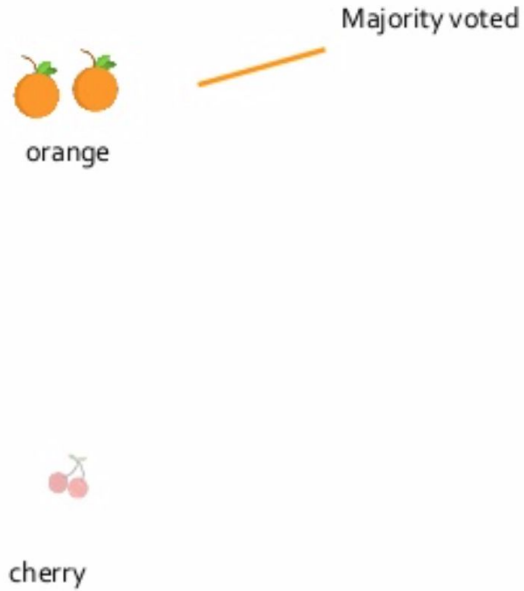
Tree 1 classifies it as an orange



Diameter = 3
Colour = orange
Grows in summer = yes
SHAPE = CIRCLE



How does a random forest work?



Practical Example:

Refer to jupyter notebook



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Questions?