**Applications of Classification Algorithms**

* Email spam classification
* Bank customers loan pay willingness prediction.
* Cancer tumor cells identification.
* Sentiment analysis
* Drugs classification
* Facial key points detection
* Pedestrians detection in an automotive car driving.

**Types of Classification Algorithms**

Classification Algorithms could be broadly classified as the following:

* ***Linear Classifiers***
  + Logistic regression
  + Naive Bayes classifier
  + Fisher’s linear discriminant
* ***Support vector machines***
  + Least squares support vector machines
* ***Quadratic classifiers***
* ***Kernel estimation***
  + k-nearest neighbor
* ***Decision trees***
  + Random forests
* ***Neural networks***
* ***Learning vector quantization***

Naïve Bayes

P(=

P(Walks)==

P(X)==

P(=

=

P(=

P>P()

Support Vector Machines

Diagram

Description automatically generated

Diagram

Description automatically generatedDiagram, shape

Description automatically generated

Randome Forest classifaction

**Ensemble Learning**:

Step 1:Pick at random K data points from the Training set

Step 2:Build the decision tree associated to these K data points

Step 3:Choose the number N tree of tree you want to build and repeat

step 1 and step2

Step4:For a new data point ,make each one of your N tree predict category to which the data point belongs and assign the new data point to the category that contains the majority vote.

Decession Tree

**CART**:

**Classification Tress**:

Classification of data

Eg:Male,Female,Apple,Orange

**Regression Trees**:

Predication of data

Predict salary ,Temperature

K-Nearest Neighbourhood:

1.Choose number of K of neighbours.

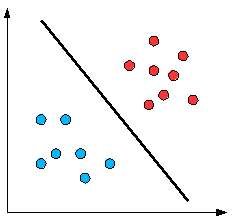
2.Take the k nearest neighbours of the new data point, according to Euclidian distance.

3.Amoung these K -neighboures, count the number of data points in each category.

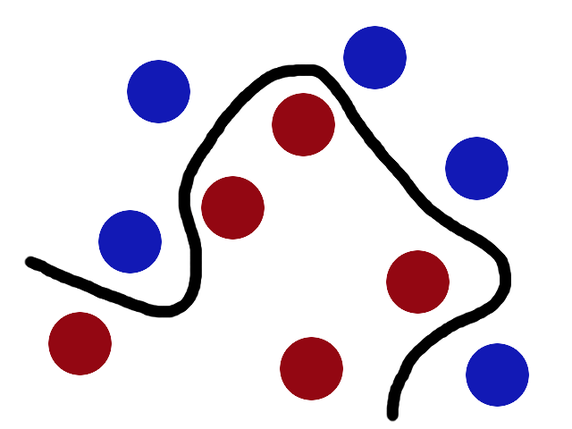
4.assign a new data point to new category.

Kernal SVM

**Linear separable**:



**Non Linear Separable**:



*Evoluting Classification Models*

1.False Positive and False Negative

2.Confussion Matrix

3.Accuracy Paradox

4.CAP curve