**KNN Algorithm**

**The K-NN working can be explained on the basis of the below algorithm:**

**Step 1** − For implementing any algorithm, we need dataset. So, during the first step of KNN, we must load the training as well as test data.

**Step 2** − Next, we need to choose the value of K i.e., the nearest data points. K can be any integer.

**Step 3** − For each point in the test data do the following −

* **3.1** − Calculate the distance between test data and each row of training data with the help of any of the methods namely: Euclidean, Manhattan, or Hamming distance. The most commonly used method to calculate distance is Euclidean.
* **3.2** − Now, based on the distance value, sort them in ascending order.
* **3.3** − Next, it will choose the top K rows from the sorted array.
* **3.4** − Now, it will assign a class to the test point based on the most frequent class of these rows.

**Step 4** – End

**Example**

The following is an example to understand the concept of K and working of KNN algorithm

Suppose we have a dataset that can be plotted as follows −

Chart, scatter chart

Description automatically generated

Now, we need to classify new data point with black dot (at point 60,60) into blue or red class. We are assuming K = 3 i.e., it would find three nearest data points. It is shown in the next diagram –

Chart

Description automatically generated

We can see in the above diagram the three nearest neighbors of the data point with black dot. Among those three, two of them lies in red class hence the black dot will also be assigned in red class.

**Face Recognition with KNN:**

In this proposed system, we are using the KNN algorithm for face recognition. However, the HOG feature will be detected faces from training images and crop that face detected part and convert it into pixel format, and store it with face Lebel (like the recognized name). So, the training dataset will be trained with KNN, and when we pass the testing image as an input image then KNN will compare with all data points like pixels then which data points are nearly matched then that the system will return that face Label as output so that we can achieve the face recognition approach.

**Expected Results:**

A collage of a person

Description automatically generated with medium confidence