CHAPTER 4

Project -1 Machine Learning

Prediction Of Different type of Microbes

In this project, we will work with Microbe.csv dataset to develop a machine learning algorithm that predicts the microbe. A model like this would be very valuable to predict the microorganism using serial no,raddi,perimeter,…..etc

4.1 Problem Statement

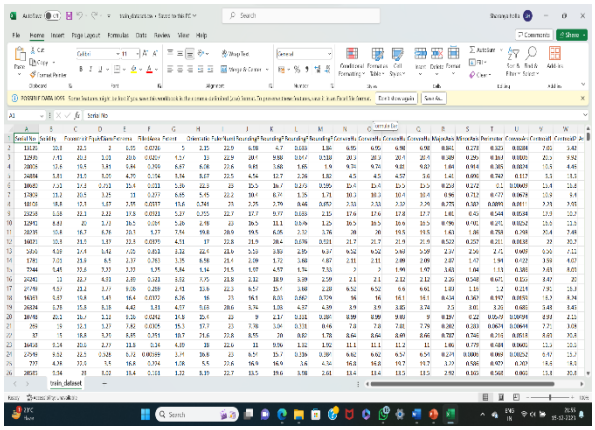
Develop a model that has the capacity of predicting the microorganism by making use of the information provided in microbes Dataset

4.2 Dataset

The dataset used in this project consists of 25 variables.The main variable we are interested is 'microorganism'. This variable predicts the fracture of the person based on the inputs given in dataset

1. **Serial No**	Enter the serial no
2. **Solidity**	Enter the solidity
3. **Eccentricity**	Enter the eccentricity
4. **EquivDiameter**	Enter the equivdiameter
5. **Extrema**	Enter the extrema
6. **FilledArea**	Enter the filledarea
7. **Extent**	Enter the extent
.	.
.	.
.	.
25. **Raddi**	Enter the raddi

The overview of the original dataset is shown in figure with its original features:



4.3 Algorithm –KNN Algorithm

K-Nearest Neighbour is one of the simplest Machine Learning algorithms based on Supervised Learning technique. K-NN algorithm can be used for Regression as well as for Classification but mostly it is used for the Classification problems. K-NN is a non-parametric algorithm, which means it does not make any assumption on underlying data. It is also called a lazy learner algorithm because it does not learn from the training set immediately instead it stores the dataset and at the time of classification, it performs an action on the dataset.

4.4 Programming Steps

•This project requires us to predict the microorganism based on the given input dataset.

•First, we read the given dataset using pandas function.

•Then we print the inputs and output from csv file.

•We initialize the model i.e., K-NN Algorithm.

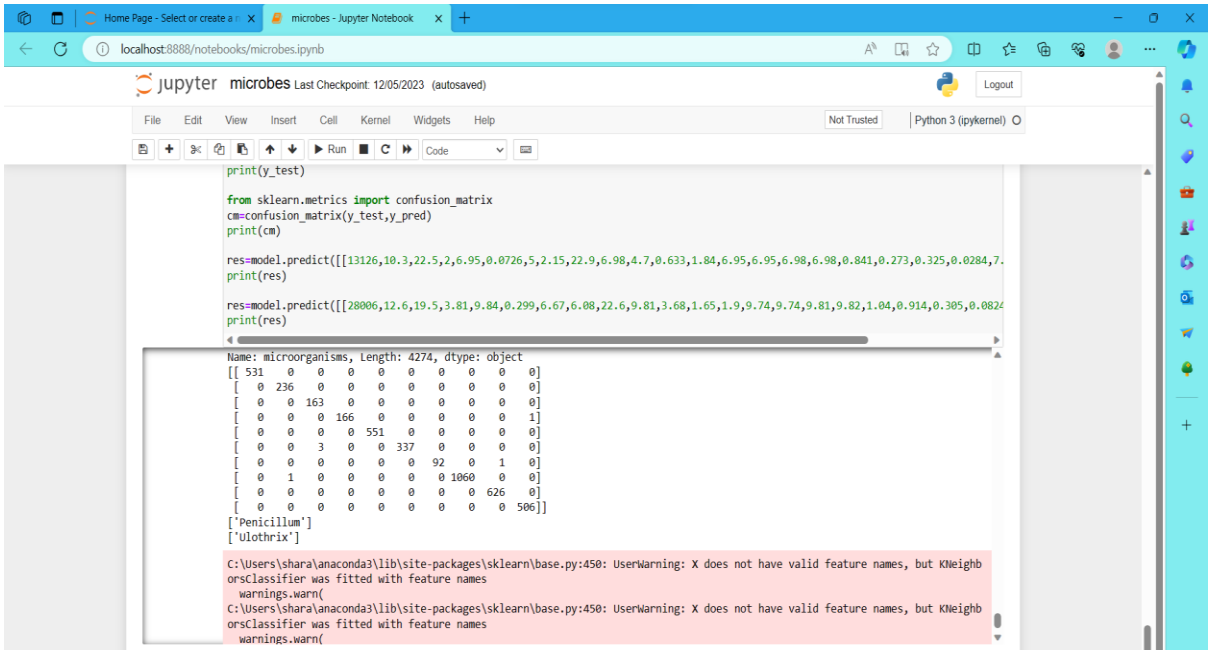
•We further implement this using Django in order for better representation

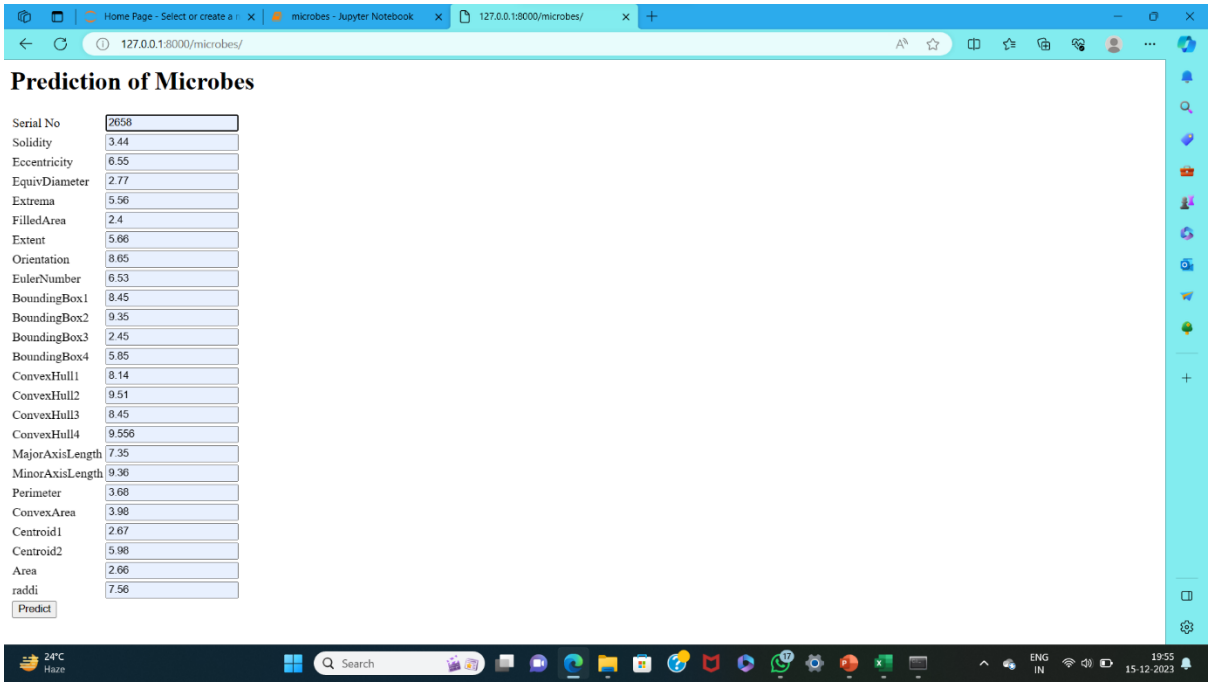
Code:

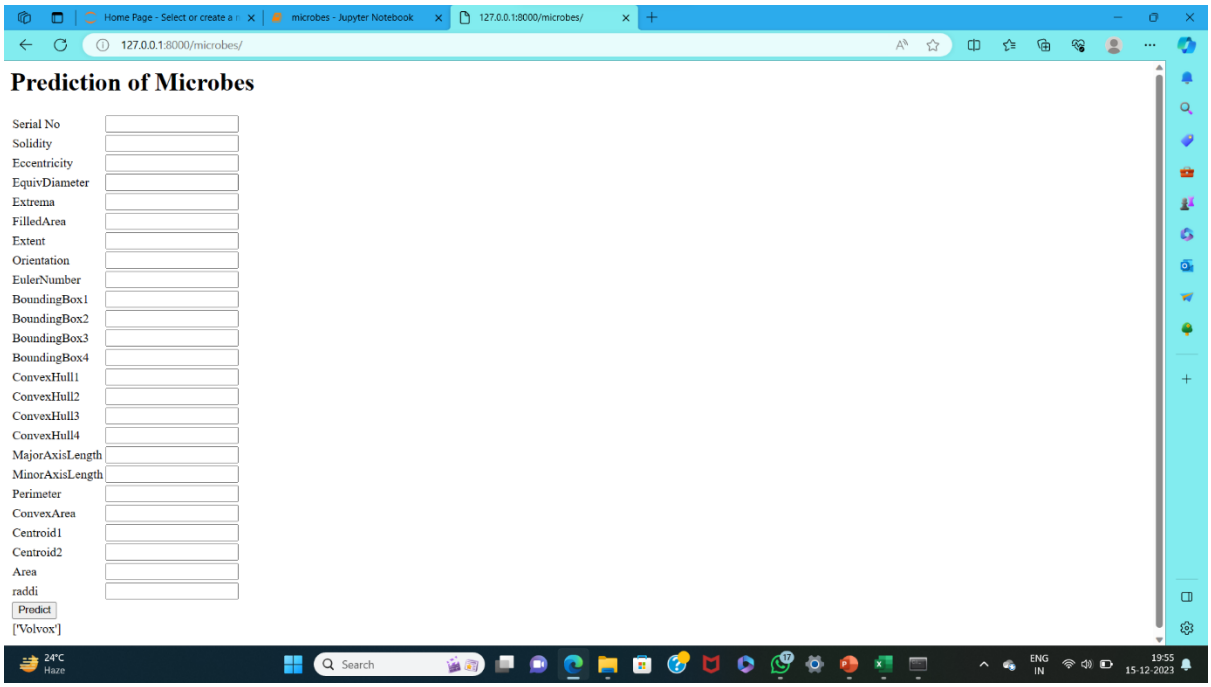
```
import pandas as pd
path="C:\\Users\\shara\\OneDrive\\Desktop\\Project\\train_dataset.csv"
data=pd.read_csv(path)
print(data)
print(data.info())
print(data.isnull().sum())

inputs=data.drop(['microorganisms'],'columns')
output=data['microorganisms']
print(inputs)
print(output)

import sklearn
```

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(inputs,output,train_size=0.8)
print(x_train)
print(x_test)
print(y_train)
print(y_test)

from sklearn.neighbors import KNeighborsClassifier
model=KNeighborsClassifier(n_neighbors=13)
model.fit(x_train,y_train)
y_pred=model.predict(x_test)
print(y_pred)
print(y_test)

from sklearn.metrics import confusion_matrix
cm=confusion_matrix(y_test,y_pred)
print(cm)

res=model.predict([[13126,10.3,22.5,2,6.95,0.0726,5,2.15,22.9,6.98,4.7,0.633,1
.84,6.95,6.95,6.98,6.98,0.841,0.273,0.325,0.0284,7.06,5.42,0.184,1.93]])
print(res)

res=model.predict([[28006,12.6,19.5,3.81,9.84,0.299,6.67,6.08,22.6,9.81,3.68,1
.65,1.9,9.74,9.74,9.81,9.82,1.04,0.914,0.305,0.0824,10.5,4.46,0.649,5.35]])
print(res)
```

OUTPUT:




Home Page - Select or create a
microbes - Jupyter Notebook
127.0.0.1:8000/microbes/
127.0.0.1:8000/microbes/
Prediction of Microbes
Serial No 2658
Solidity 3.44
Eccentricity 6.55
EquivDiameter 2.77
Extrema 5.56
FilledArea 2.4
Extent 5.66
Orientation 8.65
EulerNumber 6.53
BoundingBox1 8.45
BoundingBox2 9.35
BoundingBox3 2.45
BoundingBox4 5.85
ConvexHull1 8.14
ConvexHull2 9.51
ConvexHull3 8.45
ConvexHull4 9.556
MajorAxisLength 7.35
MinorAxisLength 9.36
Perimeter 3.68
ConvexArea 3.98
Centroid1 2.67
Centroid2 5.98
Area 2.66
raddi 7.56
Predict
24°C
Haze
Search
ENG
IN
19:55
15-12-2023


Home Page - Select or create a
microbes - Jupyter Notebook
127.0.0.1:8000/microbes/
127.0.0.1:8000/microbes/
Prediction of Microbes
Serial No
Solidity
Eccentricity
EquivDiameter
Extrema
FilledArea
Extent
Orientation
EulerNumber
BoundingBox1
BoundingBox2
BoundingBox3
BoundingBox4
ConvexHull1
ConvexHull2
ConvexHull3
ConvexHull4
MajorAxisLength
MinorAxisLength
Perimeter
ConvexArea
Centroid1
Centroid2
Area
raddi
Predict
['Volvox']
24°C
Haze
Search
ENG
IN
19:55
15-12-2023