

Ex.No.2. BINARY CLASSIFICATION

Date: 22-04-2022

Aim:

To write a python program to perform binary classification.

Equipment's Required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner / Google Colab

Concept:

- ❑ Binary classification is the task of [classifying](#) the elements of a [set](#) into two groups on the basis of a [classification rule](#).
- ❑ Only two class instances are present in the dataset.
- ❑ It requires only one classifier model.
- ❑ Confusion Matrix is easy to derive and understand.

Example: Check email is spam or not, predicting gender based on height and weight.

Libraries Used in the Program.

NUMPY

NumPy is a library for the Python programming language, adding support for large, multidimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

SKLEARN

Scikit-learn is a free software machine learning library for the Python programming language. It features various classification, regression and clustering algorithms including support-vector machines.

MATPLOTLIB

Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using generalpurpose GUI toolkits like Tkinter, wxPython, Qt, or GTK.

Algorithm:

1. Start the program.
2. Import libraries required as per requirement.
3. Define dataset use the make_ blobs () function to generate a synthetic multi -class classification dataset.
4. summarize dataset shape
5. summarize observations by class label
6. summarize first few examples
7. plot the dataset and color the by class label
8. stop the program

Program:

```
/*
```

Program to implement binary classification.

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```
*/
```

```
from numpy import where
```

```
from collections import Counter
```

```
from sklearn.datasets import make_blobs
```

```
from matplotlib import pyplot
```

```
X,y=make_blobs(n_samples=10,centers=2,random_state=1)
```

```
print(X.shape,y.shape)
```

```
counter=Counter(y)
```

```

print(counter)
for i in range(5):
    print(X[i],y[i])
for label,_ in counter.items():
    row_ix=where(y==label)[0]
    pyplot.scatter(X[row_ix,0],X[row_ix,1],label=str(label))
pyplot.legend()

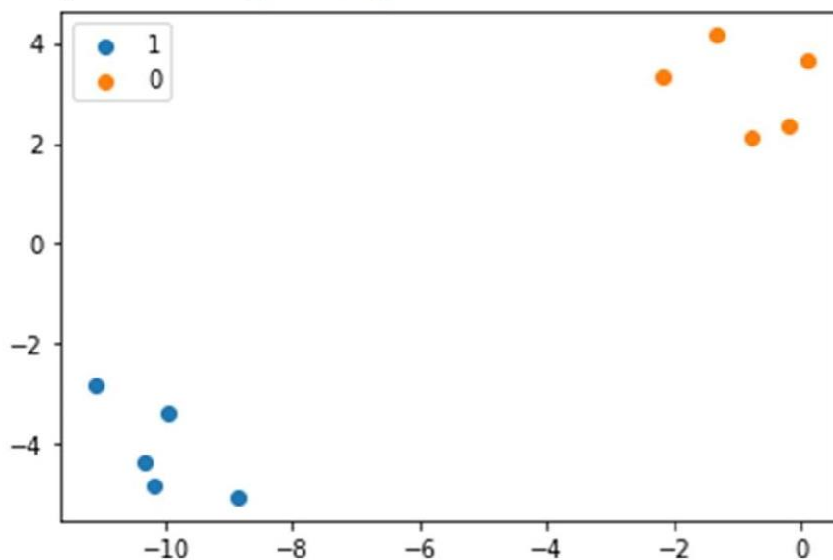
```

Output:

```

(10, 2) (10,)
Counter({1: 5, 0: 5})
[-10.17014071 -4.83120697] 1
[-11.09833168 -2.80862484] 1
[-9.95549876 -3.37053333] 1
[-8.86394306 -5.05323981] 1
[0.08525186 3.64528297] 0
<matplotlib.legend.Legend at 0x7fad81198790>

```



Result:

Thus, the python program performed binary classification successfully.