Ex.No.2. **BINARY CLASSIFICATION**

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:

NUMPY

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

SK LEARN

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:

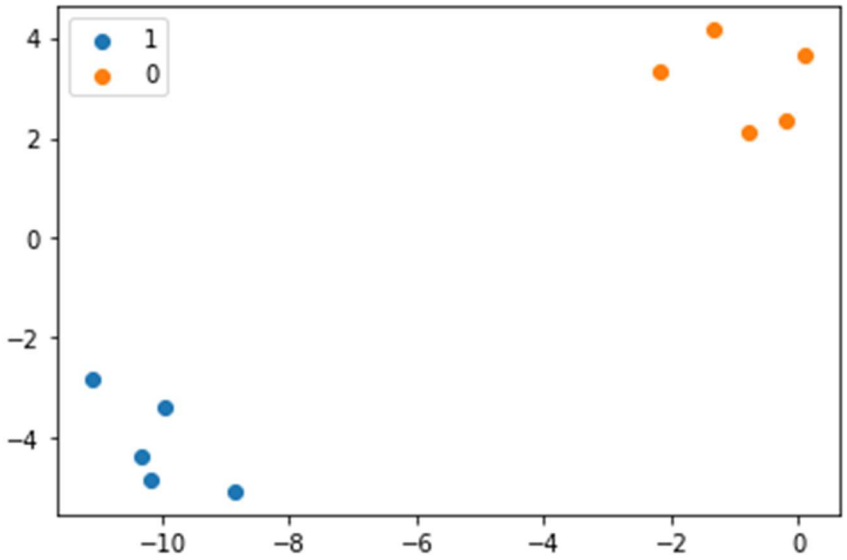
- Start the program.
- Import libraries required as per requirement.
- Define dataset use the make_blobs() function to generate a synthetic multi -class classification dataset.
- summarize dataset shape
- summarize observations by class label
- summarize first few examples
- plot the dataset and color the by class label
- stop the program

Program:

```
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.