**Expeiment-12**

**AIM:**

To implement Binary classification, Multi classification and regression

**SOFWARE**:

Python IDE

**THEORY:**

Binary classification refers to predicting one of two classes and multi-class classification involves predicting one of more than two classes. Multiclass classification or multinomial classification is the problem of classifying instances into one of three or more classes

**CODE:**

# example of binary classification task

from numpy import where

from collections import Counter

from sklearn.datasets import make\_blobs

from matplotlib import pyplot as plt

# Define dataset

X, y = make\_blobs(n\_samples=1000, centers=2, random\_state=1)

# Summarize dataset shape

print(X.shape, y.shape)

# Summarize observations by class label

counter = Counter(y)

print(counter)

# Summarize first few examples

for i in range(10):

    print(X[i], y[i])

# Plot the dataset and color by class label

for label, \_ in counter.items():

    row\_ix = where(y == label)[0]

    plt.scatter(X[row\_ix, 0], X[row\_ix, 1], label=str(label))

plt.legend()

plt.show()

# example of multi-class classification task

from numpy import where

from collections import Counter

from sklearn.datasets import make\_blobs

from matplotlib import pyplot

# define dataset

X, y = make\_blobs(n\_samples=1000, centers=3, random\_state=1)

# summarize dataset shape

print(X.shape, y.shape)

# summarize observations by class label

counter = Counter(y)

print(counter)

# summarize first few examples

for i in range(10):

 print(X[i], y[i])

# plot the dataset and color the by class label

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()

pyplot.show()

#example of regression

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from sklearn import linear\_model

hgt = np.random.randint(50, 70, 10).reshape(-1, 1)

wgt = np.random.randint(90, 120, 10).reshape(-1, 1)

from sklearn.linear\_model import LinearRegression

regression = LinearRegression()

regression.fit(hgt,wgt)

regression.predict([[60]])

**RESULT :** Binary classification, Multi classification and regression was implement successfully