**LAB EXERCISE – 11**

**Logistic Regression**

**Aim of the Experiment**

The main aim of this experiment is to explore logistic regression model of scikit-learn. The objectives of this experiment are

1. Explore random dataset generation for logistic regression.
2. Explore logistic regression model in python for randomly generated dataset

**Reference to the Textbook**

All the fundamentals are given in Chapter 5 and Appendix 2.

Random dataset for classification model can be as follows:

X, y = make\_blobs(n\_samples=200, centers=3, n\_features=3)

The n\_samples and n\_features can be changed. This has to be imported using the command,

from sklearn.datasets import make\_blobs

Logistic regression model can be created by scikit-learn as

model = LogisticRegression()

The algorithm can be applied to the given data as

model.fit(X\_train,y\_train)

The predictions of the constructed model can be done as

predicted = model.predict(X\_test)

The classification report can be generated as follows:

report\_lr = classification\_report(y\_test,predicted)

This classification report must be imported as

from sklearn.metrics import classification\_report

**Program Listing**

import pandas as pd

import numpy as np

from sklearn.datasets import make\_blobs

from sklearn.model\_selection import train\_test\_split

from sklearn.linear\_model import LogisticRegression

from matplotlib import pyplot

from sklearn.metrics import classification\_report

X, y = make\_blobs(n\_samples=200, centers=3, n\_features=3)

df = pd.DataFrame(dict(x=X[:,0], y=X[:,1], label=y))

# Print the sample top five records

print("Top five Records\n\n")

df\_top = df.head(5)

print(df\_top)

# Condition the input

X\_train,X\_test,y\_train,y\_test = train\_test\_split(X,y,test\_size=0.40,random\_state=0)

# Construct the logistic regression model

model = LogisticRegression()

# Fit the model

model.fit(X\_train,y\_train)

#Prediction for the test sample

predicted = model.predict(X\_test)

# Print the classification report

print("\n\nClassification Report")

report\_lr = classification\_report(y\_test,predicted)

print(report\_lr)

**Output**

**The top five records of 200 samples is displayed as follows:**

A screen shot of a computer

Description automatically generated

The Classification report generated for this problem is shown as follows:

Screen of a cell phone

Description automatically generated