**PRACTICAL: 7**

**AIM: : Write an application to simulate supervised and un-supervised learning model.**

Code:

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

from sklearn.linear\_model import LogisticRegression

from sklearn import datasets

dataset = pd.read\_csv("iris.csv")

dataset.describe

X = dataset.iloc[:, [0,1,2, 3]].values

y = dataset.iloc[:, 4].values

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

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X,y, test\_size=0.25, random\_state = 0)

from sklearn.preprocessing import StandardScaler

sc = StandardScaler()

X\_train = sc.fit\_transform(X\_train)

X\_test = sc.transform(X\_test)

classifier = LogisticRegression(random\_state = 0, solver='lbfgs', multi\_class='auto')

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

y\_pred = classifier.predict(X\_test)

probs\_y = classifier.predict\_proba(X\_test)

from sklearn.metrics import confusion\_matrix

cm = confusion\_matrix(y\_test, y\_pred)

print(cm)

import seaborn as sns

import pandas as pd

ax = plt.axes()

df\_cm = cm

sns.heatmap(df\_cm, annot=True, annot\_kws={"size": 30}, fmt='d', cmap="Blues", ax = ax)

plt.show()

7.B

Code :

import matplotlib.pyplot as plt

import pandas as pd

import numpy as np

import scipy.cluster.hierarchy as shc

from sklearn.cluster import AgglomerativeClustering

customer\_data = pd.read\_csv('Mall\_Customers.csv')

customer\_data.shape

customer\_data.head()

data = customer\_data.iloc[:, 3:5].values

plt.figure(figsize=(10,7))

plt.title("Customer Dendograms")

dend = shc.dendrogram(shc.linkage(data, method='ward'))

cluster = AgglomerativeClustering(n\_clusters=5, linkage='ward')

cluster.fit\_predict(data)

plt.figure(figsize=(10, 7))

plt.scatter(data[:,0], data[:,1], c=cluster.labels\_, cmap='rainbow')

plt.show()