**Practical - 8**

**Aim- Implementation of Naïve Bayes Algorithm on Jupiter Notebook using Python.**

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

from sklearn.datasets import load\_iris

iris = load\_iris()

dir(iris)

**output:-**  ['DESCR', 'data', 'feature\_names', 'filename', 'target', 'target\_names']

iris.data

**output: -** array([[5.1, 3.5, 1.4, 0.2],

[4.9, 3. , 1.4, 0.2],

[4.7, 3.2, 1.3, 0.2],

[4.6, 3.1, 1.5, 0.2],

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[5.5, 3.5, 1.3, 0.2],

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[6.2, 2.9, 4.3, 1.3],

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[5.7, 2.8, 4.1, 1.3],

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[5.8, 2.7, 5.1, 1.9],

[7.1, 3. , 5.9, 2.1],

[6.3, 2.9, 5.6, 1.8],

[6.5, 3. , 5.8, 2.2],

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[7.3, 2.9, 6.3, 1.8],

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[7.2, 3.6, 6.1, 2.5],

[6.5, 3.2, 5.1, 2. ],

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[6.5, 3. , 5.5, 1.8],

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[6.1, 3. , 4.9, 1.8],

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[7.4, 2.8, 6.1, 1.9],

[7.9, 3.8, 6.4, 2. ],

[6.4, 2.8, 5.6, 2.2],

[6.3, 2.8, 5.1, 1.5],

[6.1, 2.6, 5.6, 1.4],

[7.7, 3. , 6.1, 2.3],

[6.3, 3.4, 5.6, 2.4],

[6.4, 3.1, 5.5, 1.8],

[6. , 3. , 4.8, 1.8],

[6.9, 3.1, 5.4, 2.1],

[6.7, 3.1, 5.6, 2.4],

[6.9, 3.1, 5.1, 2.3],

[5.8, 2.7, 5.1, 1.9],

[6.8, 3.2, 5.9, 2.3],

[6.7, 3.3, 5.7, 2.5],

[6.7, 3. , 5.2, 2.3],

[6.3, 2.5, 5. , 1.9],

[6.5, 3. , 5.2, 2. ],

[6.2, 3.4, 5.4, 2.3],

[5.9, 3. , 5.1, 1.8]]”

iris.filename

**output:-** 'C:\\Users\\Admin\\anaconda3\\lib\\site-packages\\sklearn\\datasets\\data\\iris.csv'

df = pd.read\_csv('C:\\Users\\Admin\\anaconda3\\lib\\site-packages\\sklearn\\datasets\\data\\iris.csv')

from sklearn.datasets import load\_iris

iris = load\_iris()

**# store the feature matrix (X) and response vector (y)**

X = iris.data

y = iris.target

**# splitting X and y into training and testing sets**

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

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.4, random\_state=1)

**# training the model on training set**

from sklearn.naive\_bayes import GaussianNB

model = GaussianNB()

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

**output:-** GaussianNB(priors=None, var\_smoothing=1e-09)

**# making predictions on the testing set**

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

**# comparing actual response values (y\_test) with predicted response values (y\_pred)**

from sklearn.metrics import accuracy\_score

print(f'Gaussian Naive Bayes model accuracy(in %):={accuracy\_score(y\_test, y\_pred)\*100} %')

res = model.predict([[6.5,3.0,5.2,2.0]])

print(f'Result = {iris.target\_names[res[0]]}')

**output:-** Gaussian Naive Bayes model accuracy(in %):=95.0 %

Result = virginica