**Practical-8**

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

**CODE:-**

In [ ]:

import numpy as np

In [2]:

import matplotlib.pyplot as plt

In [3]:

import pandas as pd

In [6]:

from sklearn.datasets import load\_iris

iris=load\_iris()

dir(iris)

Out[6]:

['DESCR', 'data', 'feature\_names', 'filename', 'target', 'target\_names']

In [7]:

iris.data

Out[7]:

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],

[5. , 3.6, 1.4, 0.2],

[5.4, 3.9, 1.7, 0.4],

[4.6, 3.4, 1.4, 0.3],

[5. , 3.4, 1.5, 0.2],

[4.4, 2.9, 1.4, 0.2],

[4.9, 3.1, 1.5, 0.1],

[5.4, 3.7, 1.5, 0.2],

[4.8, 3.4, 1.6, 0.2],

[4.8, 3. , 1.4, 0.1],

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[5.8, 4. , 1.2, 0.2],

[5.7, 4.4, 1.5, 0.4],

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[5.7, 3.8, 1.7, 0.3],

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[4.8, 3. , 1.4, 0.3],

[5.1, 3.8, 1.6, 0.2],

[4.6, 3.2, 1.4, 0.2],

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[5. , 3.3, 1.4, 0.2],

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[6.8, 2.8, 4.8, 1.4],

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[5.8, 2.7, 3.9, 1.2],

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[6. , 3.4, 4.5, 1.6],

[6.7, 3.1, 4.7, 1.5],

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[5.6, 3. , 4.1, 1.3],

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[5.5, 2.6, 4.4, 1.2],

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[5.8, 2.6, 4. , 1.2],

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[6.2, 2.9, 4.3, 1.3],

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[5.7, 2.8, 4.1, 1.3],

[6.3, 3.3, 6. , 2.5],

[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],

[7.6, 3. , 6.6, 2.1],

[4.9, 2.5, 4.5, 1.7],

[7.3, 2.9, 6.3, 1.8],

[6.7, 2.5, 5.8, 1.8],

[7.2, 3.6, 6.1, 2.5],

[6.5, 3.2, 5.1, 2. ],

[6.4, 2.7, 5.3, 1.9],

[6.8, 3. , 5.5, 2.1],

[5.7, 2.5, 5. , 2. ],

[5.8, 2.8, 5.1, 2.4],

[6.4, 3.2, 5.3, 2.3],

[6.5, 3. , 5.5, 1.8],

[7.7, 3.8, 6.7, 2.2],

[7.7, 2.6, 6.9, 2.3],

[6. , 2.2, 5. , 1.5],

[6.9, 3.2, 5.7, 2.3],

[5.6, 2.8, 4.9, 2. ],

[7.7, 2.8, 6.7, 2. ],

[6.3, 2.7, 4.9, 1.8],

[6.7, 3.3, 5.7, 2.1],

[7.2, 3.2, 6. , 1.8],

[6.2, 2.8, 4.8, 1.8],

[6.1, 3. , 4.9, 1.8],

[6.4, 2.8, 5.6, 2.1],

[7.2, 3. , 5.8, 1.6],

[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]])

In [8]:

iris.filename

Out[8]:

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

In [11]:

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

In [14]:

from sklearn.datasets import load\_iris

iris=load\_iris()

In [16]:

X=iris.data

Y=iris.target

In [18]:

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)

In [20]:

from sklearn.naive\_bayes import GaussianNB

model = GaussianNB()

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

Out[20]:

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

In [22]:

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

In [25]:

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]]}')

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

Result = virginica