***How Naive Bayes Classifier works?***

***Code:***

import numpy as np

import matplotlib.pyplot as plt

from sklearn.naive\_bayes import GaussianNB

from sklearn.datasets import make\_classification

# Generate a synthetic dataset

X, y = make\_classification(n\_samples=1000, n\_features=2, n\_redundant=0, n\_informative=2, random\_state=42)

# Train a Gaussian Naive Bayes classifier

clf = GaussianNB()

clf.fit(X, y)

# Define the range of values for the two features

x\_min, x\_max = X[:, 0].min() - 1, X[:, 0].max() + 1

y\_min, y\_max = X[:, 1].min() - 1, X[:, 1].max() + 1

# Generate a grid of points in the feature space

xx, yy = np.meshgrid(np.arange(x\_min, x\_max, 0.1), np.arange(y\_min, y\_max, 0.1))

# Predict the class of each point on the grid

Z = clf.predict(np.c\_[xx.ravel(), yy.ravel()])

Z = Z.reshape(xx.shape)

# Plot the classification map and decision boundary

plt.contourf(xx, yy, Z, alpha=0.3)

plt.scatter(X[:, 0], X[:, 1], c=y, alpha=0.8)

plt.xlabel('Feature 1')

plt.ylabel('Feature 2')

plt.title('Naive Bayes decision boundary')

plt.show()

***Quiz:***

1. **Naïve Bayes assumes that the features are independent of each other given the class label.**

False

True

2. **Naïve Bayes can handle missing data by ignoring the missing values.**

True

False

3. **Naïve Bayes is a type of unsupervised learning algorithm.**

True

False