**Experiment 5: Implement Naïve Bayes Classifier using sklearn library**

**Theory:**

1. **Naïve Bayes Classifier**

   Naive Bayes classifiers are a family of simple probabilistic classifiers based on applying Bayes' theorem with strong (naive) independence assumptions between the features in machine learning.

   Problem statement:

   – Given features $X_1$, $X_2$,…,$X_n$

   – Predict a label Y

$$P(Y|X_1,\ldots,X_n) = \frac{P(X_1,\ldots,X_n|Y)P(Y)}{P(X_1,\ldots,X_n)}$$

or

$$P(H\ |E) = \frac{P(E\ |H)\ *\ P(H)}{P(E)}$$

- P(H) is the probability of hypothesis H being true. This is known as the prior probability.
- P(E) is the probability of the evidence(regardless of the hypothesis).
- P(E|H) is the probability of the evidence given that hypothesis is true.
- P(H|E) is the probability of the hypothesis given that the evidence is there.

**Implementation:**

1. **sklearn.naive_bayes.GaussianNB**

Syntax:

*class* sklearn.naive_bayes.**GaussianNB**() ¶

Creates Gaussian Naive Bayes (GaussianNB) classifier.

**About Dataset:**

(Describe your dataset)

**Conclusion:** In this way, we implemented the Gaussian Naïve Bayes classifier on a given dataset and measured its performance.