EXPERIMENT NO. 8

AIM:

To implement Naive Bayes classification.

THEORY:

Naive Bayes classification is a probabilistic machine learning algorithm based on baye's theorem. It is well suited for text classification task as well as other classification problem.

Here, Bayes' theorem is a fundamental concept in probability theory that describes the probability of an event, based on prior knowledge of conditions that might be related to the event. It can be stated as:

$$P(A|B) = \frac{P(B|A) \times P(A)}{P(B)}$$

Here, $P(A|B)$ is posterior probability of event A occuring.
$P(B|A)$ is likelihood of an event.
$P(A)$ is prior probability of event A occuring.
$P(B)$ is prior probability of event B occuring.

The Naive Bayes classifier assumes that the features

are conditionally independant, which means that the presence or absence of one feature does not affect the presence or absence of other features.

(1) The classifier learns the prior probabilities of each class from the training data. It also calculates the likelihood of each feature, given each class.

(2) For new data point, the classifier calculates the posterior probability of it belonging to each class using Bayes' theorem. It then assigns data point to class with the highest posterior probability, to predict values

(a) Data loading and preprocessing:

We loaded the healthcare dataset using pandas. We then selected specific columns as features and target variable. We then splitted data into training & testing sets. Then we applied feature scaling using StandardScalar to normalize the features

(b) Model Training:

We created gaussian naive bayes classifier using GaussianNB(). We trained the classifier on the

Teacher's Signature:

training dataset using classifier.fit (x=train, y-train).

(c) Prediction & Evaluation:

We made prediction on the test data using classifier.predict (x-test). We later evaluated the model's performance using a confusion matrix confusion_matrix (y-test, y-pred).

(d) Making prediction on new data:

We used the trained classifier to predict the class of new data points using classifier.predict(It has three results as 'Normal', 'Abnormal' and 'Inconclusive'.

CONCLUSION:

Our practical demonstrated the effectiveness of Naive Bayes classifier for predicting classes based on characteristics using dataset. It highlights its value as a simple yet powerful tool for data driven decision making in various fields.