# Experiment Number: 05

**Aim:** Implementation of Naïve Bayes classifier using WEKA

**Problem Statement:** To implement Naïve Bayes classifier using WEKA

## Theory:

It is a simple probabilistic classifier based on applying Bayesian' theorem with strong (naive) independence assumptions. A more descriptive term for the underlying probability model would be "independent feature model".

In simple terms, a naive Bayesian classifier assumes that the presence (or absence) of a particular feature of a class is unrelated to the presence (or absence) of any other feature. For example, a fruit may be considered to be an apple if it is red, round, and about 4" in diameter. Even if these features depend on each other or upon the existence of the other features, a naive Bayesian classifier considers all of these properties to independently contribute to the probability that this fruit is an apple.

Depending on the precise nature of the probability model, naive Bayesian classifiers can be trained very efficiently in a supervised learning setting. In many practical applications, parameter estimation for naive Bayesian models uses the method of maximum likelihood; in other words, one can work with the naive Bayesian model without believing in Bayesian probability or using any Bayesian methods.

An advantage of the naive Bayesian classifier is that it only requires a small amount of training data to estimate the parameters (means and variances of the variables) necessary for classification. Because independent variables are assumed, only the variances of the variables for each class need to be determined and not the entire covariance matrix.

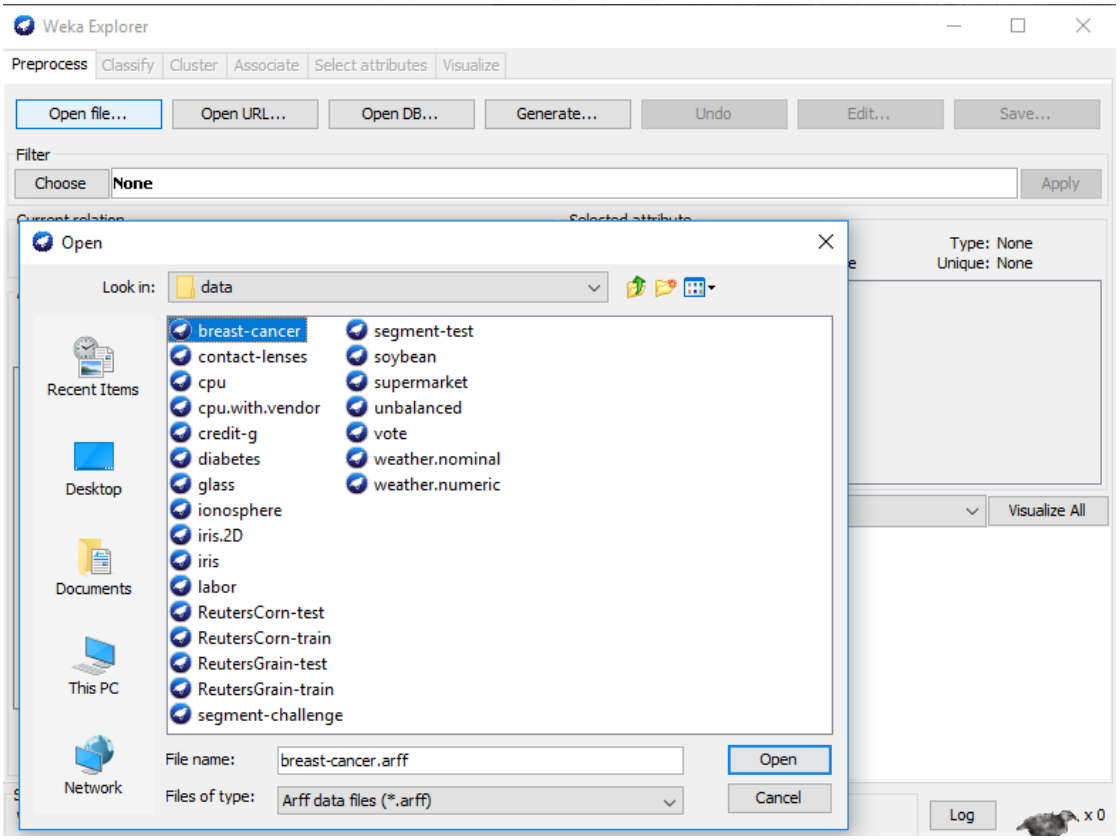
# Procedure:

## Open a data file

In “Preprocess” panel, click “Open file” button, and choose an ARFF file from “data” folder. Now the other tabs are active.

If you specify a “CSV” file, it will be automatically converted into ARFF file.

Select for example  diabetes.arff .



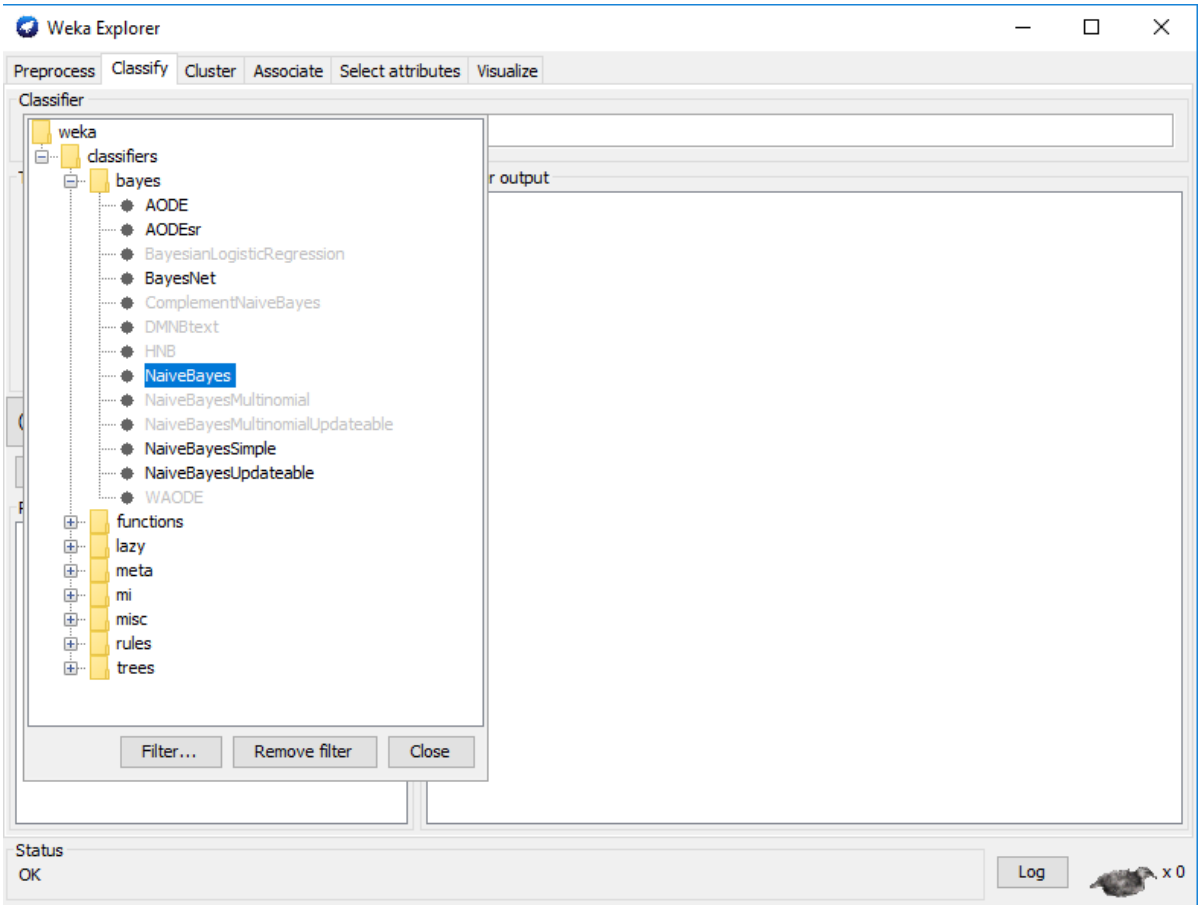
## Build a Naïve bayes classifier

- Switch to “Classify” tab
- Select “Bayes”– by Clicking “Choose” button – Selecting classifiers >> Bayes >> NaiveBayes

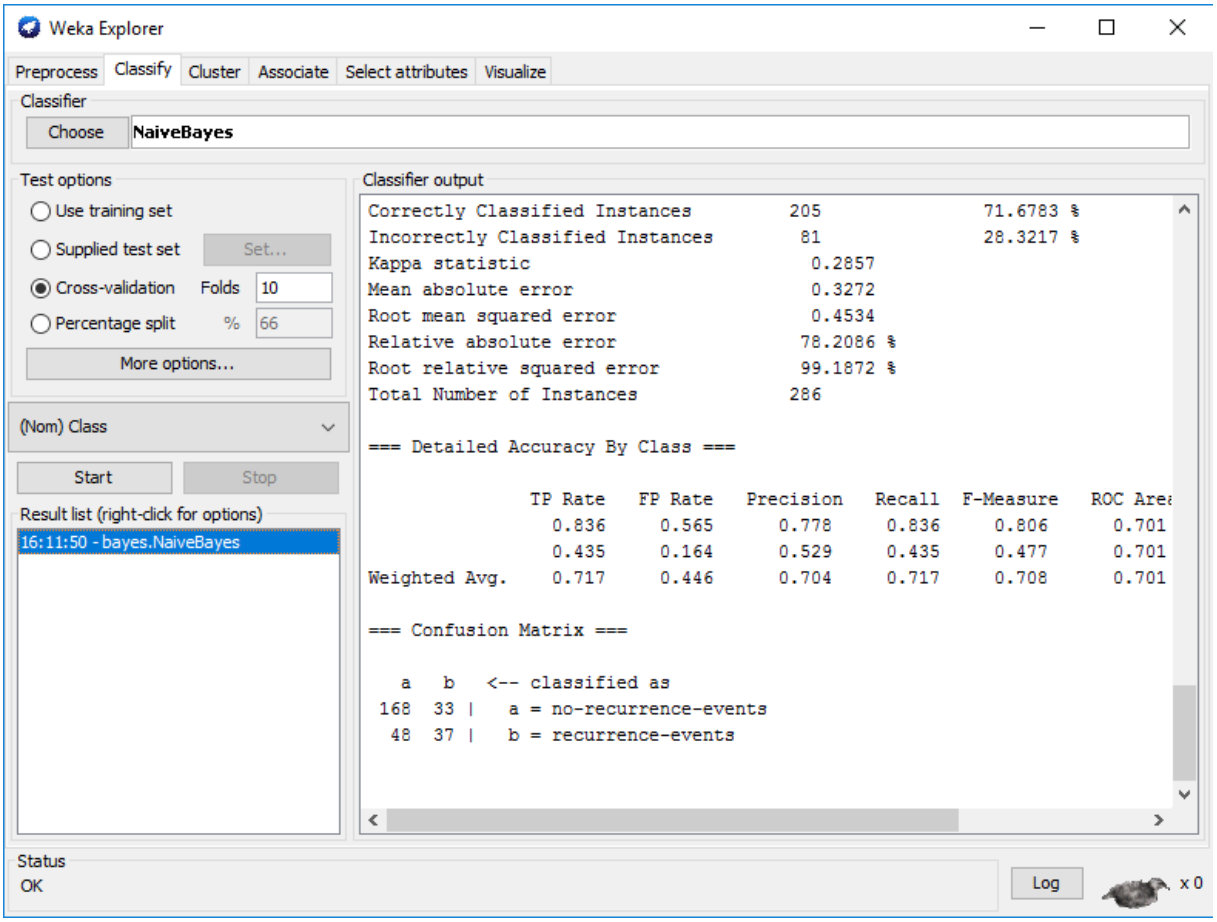


- Invoke classifier by clicking “start” button
- Weka keeps the results of different classifiers in the “Result List” pane.

## Classifier



**Naïve Bayes classifier Result**




**Classifier Output**

Classifier output includes:

- Summary of the data set
- Correctly Classified Instances
- Incorrectly Classified Instances
- Total Number of Instances
- Detailed Accuracy By Class
- Confusion Matrix
- Some other statistics

## Conclusion:

Write Conclusion