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Lab report-1

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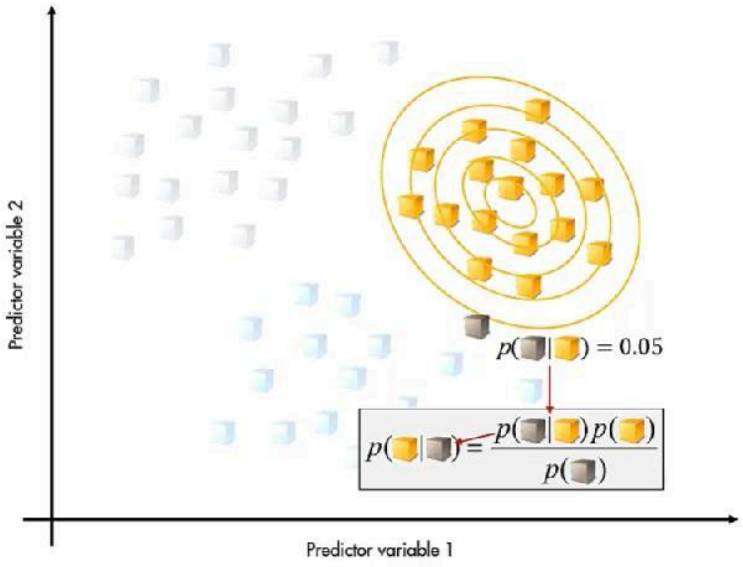
```
clc;
clear all;
close all;
```

A naïve Bayes classifier assumes the independence of the predictors within each class. A probabilty distribution within each class. We can determine a new observation at a given location.

```
img= imread("C:\Users\acer\Documents\4th year\Machine Learning
\naive_bayer.png");
imshow(img)
```



Loads and formats the data.

```
heartData = readtable("C:\Users\acer\Documents\4th year\Machine
 Learning\mlml_course_files\Course Files\heartDiseaseData.csv");
```

```
heartData.HeartDisease = categorical(heartData.HeartDisease);
% Partitions the data into training and test sets.
pt = cvpartition(heartData.HeartDisease,"HoldOut",0.3);
hdTrain = heartData(training(pt),:);
hdTest = heartData(test(pt),:);
```

Naive Bayes function

You can set the "DistributionNames" property using an array of distribution names. Repmat function to create a string array with repeated values.

```
dists = [repmat("kernel",1,11) repmat("mvmn",1,10)];
mdl = fitcnb(hdTrain,"HeartDisease","DistributionNames",dists)
% mdl = fitcnb(hdTrain,"HeartDisease","DistributionNames","kernel")
```

```
mdl =

  ClassificationNaiveBayes
            PredictorNames: {1×21 cell}
              ResponseName: 'HeartDisease'
     CategoricalPredictors: [12 13 14 15 16 17 18 19 20 21]
                ClassNames: [false    true]
            ScoreTransform: 'none'
           NumObservations: 299
         DistributionNames: {1×21 cell}
    DistributionParameters: {2×21 cell}
         CategoricalLevels: {1×21 cell}
                    Kernel: {1×21 cell}
                   Support: {1×21 cell}
                     Width: [2×21 double]
```

Calculating the loss for the training and test sets

Shows us the error in the prediction of the data in the training and the testing set. Also shows the loss in data for training and testing test.

```
errTrain = resubLoss(mdl);
errTest = loss(mdl,hdTest);
disp("Training Error: " + errTrain)
disp("Test Error: " + errTest)
```

```
Training Error: 0.16054
Test Error: 0.32735
```

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