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**Homework 3**

**Reading Data:** I read the files with the same implementation as homework 2. Additionally, I changed one hot encoding to label encoding.

**Estimating Parameters:** I estimated the feature probabilities by simply taking their mean

against all elements of a given class.

**Images:** I resized my arrays for each class then concatenated them together. I did some image manipulations using the ‘PIL’ library to obtain the output given in the PDF.

**Scoring:** I used Bernoulli Naive Bayes Classifier by using the following function from the book.



I did not use P(C) because it is a constant as the prior probability of each class is 0.2.

**Confusion Matrix:** I predicted the class of each observation by taking the highest class score from the score array. Created the confusion matrix comparing the prediction with truth using pandas.crosstab. For the test set I used the estimated parameters from the training set.