Margin =

Classification score for true class - Maximal Classification score for the false classes.

1. The definition of classification score depends on classifier.

Example: KNN (5KNN)

A. Classification score for true class = % of neighbors belonging to true class

B. Classification score for false class = % of neighbors belonging to false class

Take maximum of B.

Example: Naive Bayes

A. Classification score for true class = Posterior probability for true class given x.

B. Classification score for false class = Posterior probability for false class given x.

Take maximum of B.

Example: 5 KNN

corresponding to an observation x, we found that

3 neighbors belong to +

2 neighbor belong to -

true class is +

the classification score for the true class would be 3/5

the classification score for the flase class would be 2/5

Margin = 3/5-2/5 = 1/5

6 KNN

3 neighbors belong to +

2 neighbor belong to -

1 neighbor belong to 0

true class is +

the classification score for the true class would be 3/5

the classification score for the false class - would be 2/5 and false class 0 would be 1/5.

the maximum of (2/5,1/5) is 2/5 so

Margin = 3/5-2/5 = 1/5

Similarly for naive bayes

We found that the P(+/x) = 0.75

the probability for P(-/x) = 0.25

True class + than

classification score for the true class would be 0.75

the classification score for the false class = 0.25

Margin = 0.75-0.25 = 0.5