Multilabel classification

I explored and compared the performance of different multilabel classification algorithms on different datasets using the metrics accuracy score and Hamming loss. Accuracy score is the proportion of predicted labels that exactly match the corresponding labels in the test set, higher being better. The Hamming loss is the fraction of incorrectly predicted labels, lower being better.

The algorithms I used were decision tree, random forest, and multilabel kNN with random state = 0. The datasets I used were emotions, genbase, and medical.

Results

For the emotions dataset, the best performing classifier by both accuracy and Hamming loss was random forest with an accuracy score of 0.28 and Hamming loss of 0.19. Decision tree and kNN both had around 0.20 accuracy and 0.30 Hamming loss.

For the genbase dataset, the best performing classifier was also random forest by both accuracy score and Hamming loss, with 0.97 accuracy and 0.0013 Hamming loss, with decision tree only being slightly worse. Multilabel kNN was significantly worse with 0.27 accuracy and 0.047 Hamming loss.

For the medical dataset, the best performing classifiers were decision tree and random forest, both having accuracy around 0.64 and Hamming loss around 0.12-0.14. Multilabel kNN was significantly worse with 0.43 accuracy and 0.019 Hamming loss.