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COSC 4335*“Data Mining”* Assignment 3 Fall 2018

*Making Sense of Data—Learning and Comparing Classification Models for a Dataset*

First Draft

Individual Project

Due date: Th., November 15, 11p (if you submit by Tu., November 13. 11p you get a 3% bonus)

Last updated: October 22, 2018 at 9:30am

This course assignment is an opportunity for you to investigate different classification approaches; the idea is to apply different classification techniques to a challenging dataset, to compare the results, to potentially enhance the accuracy of the learnt models via selecting better parameters/preprocessing/using kernels/incorporating background knowledge and to summarize your findings in a report. You must choose one dataset from the below list and compare and interpret the results of using different approaches, listed below, for the dataset:

List of datasets to choose from:

1. Leaf Data Set: <https://archive.ics.uci.edu/ml/datasets/Leaf>
2. Mushroom Data Set: <https://archive.ics.uci.edu/ml/datasets/Mushroom>
3. Tic-Tac-Toe Endgame Data Set: [https://archive.ics.uci.edu/ml/datasets/Tic-Tac-Toe+Endgame](https://archive.ics.uci.edu/ml/datasets/Tic-Tac-Toe%2BEndgame)

Next select any 3 from the following 4 approaches to obtain classification models for the dataset you chose above:

1. Neural Networks
2. Support Vector Machines
3. Random Forest
4. Decision Trees

Other requirements for Assignment3:

* Accuracy of classification algorithms should be measured using 10-fold cross validation.
* Classification models that achieve higher accuracies will get more points.
* In your report after comparing the experimental results, write a paragraph or two trying to explain/speculate why, in your opinion one classification algorithm outperformed the others.
* Include a brief discussion in your report, how you have selected the parameters of particular data mining algorithms.
* In the report also include a brief description of the software you have used in the project.
* Finally, at the end of your report provide a 1-2 paragraphs summary that summarizes your most important findings of Assignment3
* Your report must contain all the results you obtained for the 3 classification models as only the report will be graded.
* R supports support vector machines, neural networks, and random forests. However, you can use any tool you like for Assignment3; e.g. scikit-learn is another popular tool.

Deliverables:

* Please submit ONLY the report using blackboard.
* Name the report as *<last name>\_StudentID\_*P3.docx (or *<last name>*\_*StudentID\_*P3\_.pdf )