CENG 420 | ELEC 569A

Assignment Three due date (July 18, 2017)

There are 2 pages and 3 questions in this assignment. Read the questions carefully before you attempt to answer the assignment

QUESTION 1) [CENG-420: 80 Points] [ELEC-569A: 100 Points]

K-Nearest Neighbors Algorithm is a supervised machine learning algorithm that we can use for classification and regression problem. By default, the KNN works for binary classification problems. Work with your team to extend the KNN to work with one-class classification problem where the training data the algorithm has one class, and in the production, the algorithm works with more that one class.

Step 1) Verify your algorithm using the iris flower data set by selecting 15 random instances from the "Iris setosa" class. Use 10 instances for training and 5 instances for testing.

Step 2) After you built the KNN one class classifier test your algorithm in production by selecting randomly 5 instances from " Iris versicolor" class and 5 instances from the "Iris setosa". Make sure that the 5 instances from the "Iris setosa" for production test are not included in the 15 random instances you used in the training and validation in Step 1.

Requirement Reading

Please download the paper "A review of novelty detection" by Marco A.F. Pimentel n , David A. Clifton, Lei Clifton, Lionel Tarassenko

Read the following sections 1 Introductions, 3 Distance-based novelty detection, and 7 Application domains. The paper is attached and on the course github repo

QUESTION 2) [CENG-420: 70 Points] [ELEC-569A: 50 Points]

The database below is from Movies Night dataset. Each row has a collection of movies watched by a group of users. What association rules can be found in this set if the target minimum support (i.e coverage) is 60% and the target minimum confidence (i.e. accuracy) is 80% ?

T1: King Arthur, American Pie, Daredevil, Batman vs Superman
T2: Cinderella, American Pie, Batman vs Superman, Enchanted,
T3: Daredevil, American Pie, Cinderella, Enchanted, Batman vs Superman
T4: Batman vs Superman, American Pie, Daredevil

QUESTION 3) Write your own Final Exam|Quiz

Write or design one question in one of the following topics

- Supervised Learning
- Unsupervised Learning
- Neural Network and Deep Learning

The group with the best or the most interesting question will be awarded **20 bonus points** limited to the assignments (any of the three assignments.)

Finally, one or more of the top (best) suggested questions by all the groups will be **included** in the final quiz|exam