# Data Structures and Algorithms

# INFO 6205

# Homework 9

# Due: November 17, 2019

Put all your java, compiled class files and documentation files into a zip file named Homework9.zip and submit it via the dropbox on the blackboard before the END of

due date. Put your name on all .java files. There will be a short Quiz on this homework.

1. Describe these concepts:

Predictive accuracy?

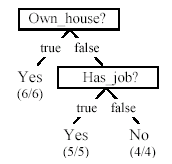
What is the key in building a decision tree?

What is evaluation method?

Describe ALL evaluation classification methods and their differences?

Scoring and Ranking Method, How does it work?

Lift Analysis Curve

How does Naive Bayes is different from other Evaluation Classification methods?

2. Consider the sequences x = TACGGGTAT and y = GGACGTACGA. Assume that the match score is +1, and the mismatch is -1, and gap penalties is -2.

A) Fill out the dynamic programming table for a global alignment between x and y.

B) Draw arrows in the cells to store traceback information.

C) What is the score of the optimal global alignment and what alignment(s)

achieves this score?

3. Consider this decision tree. Is this an optimal decision tree?

Data: Loan application data

Task: Predict whether a loan should be approved or not.

Performance measure: accuracy

4. Consider n-fold cross-validation method:

a) How does algorithm work for Training and Test

<https://towardsdatascience.com/why-and-how-to-cross-validate-a-model-d6424b45261f>

b) Explain this code. Compile and Run if you can, analyze the results.

<https://github.com/haifengl/smile/blob/master/core/src/main/java/smile/validation/CrossValidation.java>

5. Naive Bayes Classification,

<https://towardsdatascience.com/naive-bayes-classifier-81d512f50a7c>

Naive Bayes three types of classifiers. What are they, explain.

How does it work? Provide an example showing results

6. Consider the following example using Naive Bayes classifier:

<https://www.codingame.com/playgrounds/6734/machine-learning-with-java---part-5-naive-bayes>

a) Describe Example

b) Run program, describe outputs

c) Take the Java code and build it in your environment