CS4486 Artificial Intelligence
Project 2

香港城市大學
City University of Hong Kong
專業 創新 胸懷全球
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Important Notes

1. *Write your report using your preferred word editor (maximum 15 pages). On top of the first page, provide your name and matriculation number.*
2. *Students can modify the Matlab file provided or use other programming language to solve the problem given. All modifications should be justified and explained clearly in the report.*
3. *The solution and report should be the results of each individual work.*
4. *The report together with the codes should be submitted in a zip file ([Your MatricNumber].zip) to the Canvas system before the due date of* ***4 May 2020 (Monday, 11:59PM)****. No late submission will be accepted. If you have any query, please kindly contact my TA Mr HUANG Zhian (zahuang2-c@my.cityu.edu.hk).*

Project Description

You are required to implement an artificial neural network (ANN) for solving a diabetes classification problem using the training method of genetic algorithm. Some information regarding this classification problem are available on Machine Learning Repository website (http://archive.ics.uci.edu/ml/datasets/diabetes). The purpose of this project is to learn, by looking at the various aspects of an application, the strengths and limitations of ANN and its training methods.

An example of multi-layer perceptrons (MLPs) for solving the diabetes classification problem using gradient descent-based backpropagation training method is provided (together with the source codes in Matlab and the dataset file). Students can modify the Matlab file provided or use other programming language to solve the diabetes classification problem based on the given dataset using a type of ANNs via the training method of genetic algorithm.

The report should include the following details:

- A short description of the problem.
- What are the inputs and outputs of the ANN?
- How is training data gathered?
- How is the ANN trained (or learned)?
- How do you ensure that the ANN can generalize well? (Note: Generalization refers to the ability of the ANN to perform accurately on unseen data.)
- How does the ANN perform in comparison with other methods/training algorithms?
- You are encouraged to experiment with the various parameters, for example, different number of hidden layers in ANN, different number of hidden units in ANN, different population size and number of generations in the genetic algorithm etc., and discuss the effects of changing these parameters.
- Any other interesting information that you think is pertinent.