COMPUTATIONAL INTELLIGENCE PROJECT – FALL 2022

FOR MY DEAR STUDENTS

The current project may seem a little challenging to you, because you may not be already familiar with most of the classification methods. However, you don't need to be intimidated by the project. You need merely to study the specified section of the book (ISL book), watch the related part of the course (the ML bootcamp by J. Portilla) and maybe do some search. I believe in you. Do your best.

Z. Dehghani-Bidgoli

PROJECT DESCRIPTION

You'll be given a dataset containing observed values of 12 predictors on 49 instances, as well as an output variable. The output variable is a qualitative (categorical) variable with values in three different classes. In addition, you'll be allocated one of the following classification methods randomly.

#	Classification method	Section no. on ISL	Part no. on the ML bootcamp
1	KNN	2.2	18
2	Logistic Regression	4.3	17
3	LDA, QDA	4.4	-
4	Naïve Bayes	4.4	-
5	SVM	Ch. 9	20
6	Decision Tree	Ch. 8	19
7	Neural Networks	10.1	25

The Objective

Using the data and the given classification method do the following tasks:

- **Task #1: Carry out an exploratory data analysis (EDA) and provide some informative plots, as well as giving your insights into the data on the basis of the plots.**
- **Task #2: Classify the data using the given classification method in to the three different classes. Use leave-one-out (LOO) cross validation. In the end, report the overall test confusion matrix, as well as the accuracy in addition to the method details such as hyperparameter values, learning time and so on.**
- **Task #3(optional): Opt for more significant predictors using one or multiple variable (feature) selection methods and report the results (the same as task #2) on the reduced data. Discuss the results in comparison with each other (if any) and those on the whole dataset. Has the feature selection been useful? In what way?**

The Opportunity

Reaching an accuracy greater than 87.7% brings you an extra bonus of 2 marks.

The Report

*Arrange the results in a well-structured document as the report, then email me the report, and the Jupyter notebook (the code) by the end of **Bahman**. Moreover, you need to present your results and findings in either an on-line or on-site meeting for me and your classmates.*