

## BLG 454E Learning From Data - HW2

**Deadline: 29/12/2024 23:59**

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### Homework Policy

- Use comments whenever necessary to explain your code.
- You will use Python as the programming language.
- You will be given an ipynb file that requires completing the necessary sections.
- You can not import additional libraries; only use built-in functions and imported libraries by us.
- We encourage you to use [Google Colab](#) and not deal with any Python environment setup.
- You will submit two files: the notebook file you completed and the report of your work.
- For any comments or questions, please contact your TAs;
  - [erzurumluoglu18@itu.edu.tr](mailto:erzurumluoglu18@itu.edu.tr)
  - [saritas21@itu.edu.tr](mailto:saritas21@itu.edu.tr)

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### Homework Description

- As your second assignment, we prepared this homework that covers the implementation and application of Decision Tree and Logistic Regression methods.
- There are two sections in the given ipynb file. In the first one, you will be asked to code your own Logistic Regression method by using MSE loss and Cross Entropy Loss. For the second section, you will implement your own Decision Tree method.
- The descriptions are written in the ipynb file.
- After that, we want you to prepare a report whose details are below.

### **Report Content:**

1. Provide a theoretical background of the Logistic Regression Method and loss functions. Provide detailed comments on the results obtained. Discuss the impact of the learning rate and the number of iteration parameters on accuracy scores during the training process, utilizing hyperparameter tuning for analysis (15 points)
2. Provide a theoretical background of the Decision Tree method and provide detailed comments on the results obtained. Discuss the impact of the max\_depth hyperparameter on the accuracy score, utilizing hyperparameter tuning for analysis. (15 points)