

|  |  |  |  |
| --- | --- | --- | --- |
| Course | Machine Learning (IN221) | | Feb. 2025 |
| Staff | Dr. Mahmoud Gamal | Eng. Ahmed Métwalli | |

## Sheet 2: Z-Score Normalization – Cross Validation and Logistic Regression

## Question 1:

We have a dataset of students' study hours and their attendance corresponding exam scores:

Solve using Logistic Regression algorithm, use Alpha = 0.01, 0.05, 0.1 and compare loss.

|  |  |  |  |
| --- | --- | --- | --- |
| **Student** | **Hours Studied** | **Attendance (%)** | **Passed (Y)** |
| 1 | 2 | 90 | 0 |
| 2 | 4 | 60 | 0 |
| 3 | 6 | 80 | 1 |
| 4 | 8 | 50 | 0 |
| 5 | 10 | 90 | 1 |

**Guidelines:**

* **Perform Z-Score normalization**
* **Only 3 iterations**

## Question 2:

Explain the difference between linear regression and logistic regression. Show how cross validation works for regression and for classification, their types and how they detect overfitting and underfitting.