

Machine Learning Assignment 1

13th January 2025

Introduction

Welcome to the first assignment of your Machine Learning course. In this assignment, you will implement and compare three supervised learning algorithms: **Linear Regression**, **Logistic Regression**, and **Support Vector Machines (SVM)**.

Objective

The goal of this assignment is to:

- Train models using Linear Regression, Logistic Regression, and SVM on the provided training dataset.
- Predict labels for the test dataset using the trained models.
- Submit the predicted labels as a CSV file for evaluation.

Dataset Details

You are provided with:

- **Training Dataset:** Contains features and corresponding labels. Use this dataset to train your models.
- **Test Dataset:** Contains only the features (no labels). Use your trained models to predict the labels for this dataset.

Instructions

1. Open the provided Jupyter Notebook

- `ml-assignment1-part1.ipynb`
- `ml-assignment1-part2.ipynb`

These contain the skeleton code and detailed comments to guide your implementation.

2. Use the training dataset to implement:

- Linear Regression for regression tasks.
 - Logistic Regression and SVM for classification tasks.
3. Predict the labels for the test dataset using the trained models.

Submission Guidelines

- Submit your predicted labels in a CSV file with naming format as instructed in notebook.
- Upload the CSV file and jupyter notebook as single zip file named as RollNo.zip to the submission portal before the deadline.
- Ensure your CSV file follows the required format to avoid penalties.

Evaluation Criteria

Your submission will be evaluated based on:

1. Distribution of loss on test data for Linear Regression task.
2. Accuracy on the unlabelled test data for classification tasks (Logistic Regression and SVM).
3. Correct implementation of the models in the provided notebook.
4. Adherence to the submission format.

Important Notes

- Ensure reproducibility by setting random seeds wherever necessary.
- You are encouraged to explore hyperparameter tuning to improve the performance of your models.
- Plagiarism in any form will result in serious action.

Deadline for Submission: 26th January 2025 (EOD)