Pattern Recognition and Machine Learning
Assignment 3
Course Instructor : Arun Rajkumar.
Release Date : April 18, 2024
Submission Date: On or before 11:59:59 PM on May 05, 2024

SCORING: There is 1 question in this assignment. The contribution of points scored in this assignment towards your final grades will be 10 points

The points will be decided based on the clarity and rigour of the report provided and the correctness of the code submitted.

WHAT SHOULD YOU SUBMIT? You should submit a zip file titled 'Solutions_rollnumber.zip' where rollnumber is your institute roll number. Your assignment will NOT be graded if it does not contain all of the following:

- A text file titled 'Details.txt' with your name and roll number.
- A PDF file which includes explanations regarding each of the solution as required in the question. Title this file as 'Report.pdf'
- Clearly named source code for all the programs that you write for the assignment .

CODE LIBRARY: You are expected to code all algorithms from scratch. You cannot use standard inbuilt libraries for **algorithms** taught in class. You are free to use inbuilt libraries for plots. You can code using either Python or Matlab or C.

GUIDELINES: Keep the below points in mind before submission.

- Plagiarism of any kind is unacceptable. These include copying text or code from any online sources. These will lead to disciplinary actions according to institute guidelines.
- Any graph that you plot is unacceptable for grading unless it labels the x-axis and y-axis clearly.
- Don't be vague in your explanations. The clearer your answer is, the more chance it will be scored higher.

LATE SUBMISSION POLICY You are expected to submit your assignment on or before the deadline to avoid any penalty. Late submission incurs a penalty in points equal to the number of days your submission is late by. Any late submission post three days of the deadline would not be graded and will fetch 0 points.

SPAM or HAM

In this assignment, you will build a spam classifier from scratch. No training data will be provided. You are free to use whatever training data that is publicly available/does not have any copyright restrictions (You can build your own training data as well if you think that is useful). You are free to extract features as you think will be appropriate for this problem. The final code you submit should have a function/procedure which when invoked will be able to automatically read a set a emails from a folder titled test in the current directory. Each file in this folder will be a test email and will be named 'email.txt' ('email1.txt', 'email2.txt', etc). For each of these emails, the classifier should predict +1 (spam) or 0 (non Spam). You are free to use whichever algorithm learnt in the course to build a classifier (or even use more than one). The algorithms (except SVM) need to be coded from scratch. Your report should clearly detail information relating to the data-set chosen, the features extracted and the exact algorithm/procedure used for training including hyperparameter tuning/kernel selection if any. The performance of the algorithm will be based on the accuracy on the test set.