CS:5101 Machine Learning

Term 3 (Dec 2020 - Feb 2021)

Programming Assignment - 1

Linear Regression & Ridge Regression

Due Date

1) Learn a function, f : $\mathbb{R} \rightarrow \mathbb{R}$, given some training data $X \in \mathbb{R}$, $y \in \mathbb{R}$ using regression, Where

- X : training feature
- y : training label

Implementation of regression function should be done as explained below:

- linear relation between independent and dependent variable (linear regression)
- with L2 regularizer (ridge regression)

Also use cross validation methods K-fold and Leave one Out(LOO) to fine tune your hyperparameter values You need to submit following:

- code in python(.py) file (python notebook are not allowed, in case you code in jupyter notebook covert it to python format and submit)
- It should be done such that we can run the code in following format
  python $< rollnumber.py >< cross\_validation\_technique >< hyperparameter\_value >$
- code should input training data and test data from file as given (from same directory of .py file) and write prediction in submission.csv with two column (X_test,y_test)
- submit a text file with following details cross validation method used, best hyperparameter value ie., in the format
  python $< rollnumber.py >< cross\_validation\_technique >< hyperparameter\_value >$ (command line to execute the code)
- evaluation scheme:
  - 2 mark - K- fold, LOO
  -2 mark - Linear, Ridge
  -1 mark - least mse value

We will be executing your code and checking for plagiarism. For plagiarised code mark will be zero. You are allowed to use necessary inbuilt libraries from scikit learn for implementation