

ML Lab (CS360)

Assignment E1

Total Marks: 10 marks

1. Implement the linear regression using the Gradient Descent Algorithm (batch mode) using the given data splittings:

Dataset: Boston house pricing dataset.

(Hint to load the dataset

```
from sklearn import datasets
```

```
boston = datasets.load_boston(return_X_y=False))
```

```
a) train(30%), validation (10%), and test(60%)
```

The sets of hyperparameters for validation (in case of a) are to be used :

- i) Learning rate : 0.1 , rho : 0.5, epoch : 10
- ii) Learning rate : 0.01, rho : 0.6, epoch : 20
- iii) Learning rate : 0.02, rho : 0.7, epoch : 30
- iv) Learning rate : 0.03, rho : 0.8, epoch : 40
- v) Learning rate : 0.001, rho : 0.9, epoch: 50

Note: Same weights should be initialized every time; **4 marks for only correct coding without results**

Report the following results in .xls **[6 marks (2+2+2)]**

I. Validation MSE considering five sets of hyperparameters

II. Train MSE, Test MSE, Validation MSE considering the best set of hyperparameters

III. Graph plotting for Train MSE vs. Epochs considering the best set of hyperparameters

Please do not copy anyone's code. Try to learn to code.

Thank you
Happy learning