

# Statistical Methods in AI

## Problem 4

### Linear Regression

#### Lasso Regularizations

A Model is trained using the different values of alpha.

Alpha	Accuracy
0.0002	0.720
0.0004	0.731
0.01	0.639
0.1	0.639

Alpha = 0.0004 and Threshold = 0.55

#### Ridge Regularizations

Alpha	Accuracy
0.05	0.72
0.02	0.73
0.1	0.71
1.0	0.69
10	0.64

Alpha = 0.02 and Threshold = 0.55

## Elastic-net Regularizations

The two hyperparameters in it are:-

- 1) alpha
- 2) l1\_ratio

l1\_ratio (constant) = 1. Observe accuracy on changes alpha

Alpha	Accuracy
0.00001	0.707
0.0001	0.702
0.001	0.697
0.01	0.639

alpha(constant) = 0.00001 and l1\_ratio is changing

l1_ratio	Accuracy
0.00001	0.707
0.0001	0.707
0.01	0.707
0.1	0.707
1	0.707
100	0.697
1000	0.639

alpha = 0.0001, l1\_rate = 1 and Threshold = 0.56

## No Regularizations

Obtained accuracy = 0.7452 as no hyperparameter.