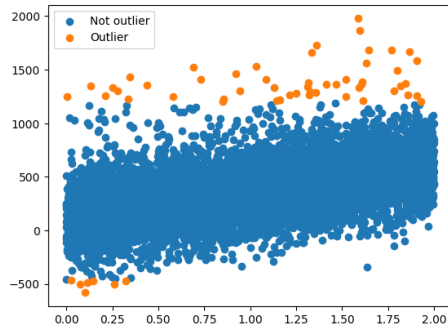


# Assignment1: Linear Regression

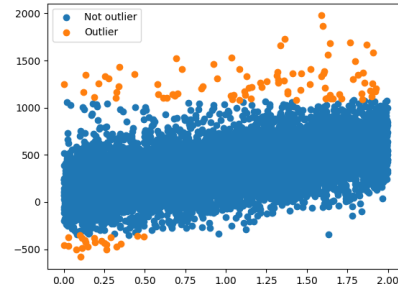
2022EE31883

August 2024

## 1 Data Outliers

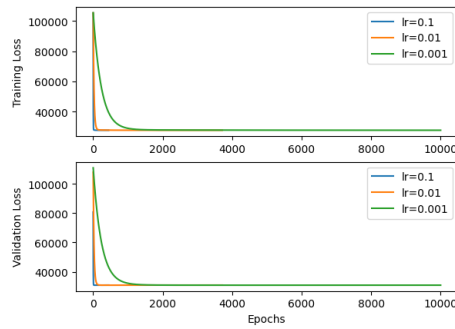


(a) Z-score (YvsX)

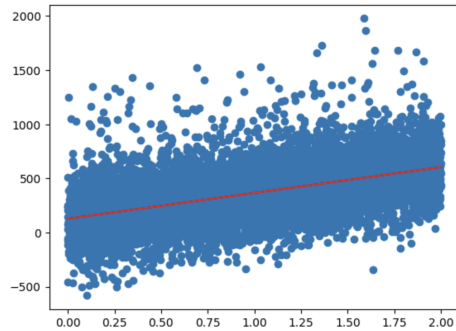


(b) Interquartile Range (IQR) (YvsX)

## 2 Gradient Descent (GD)



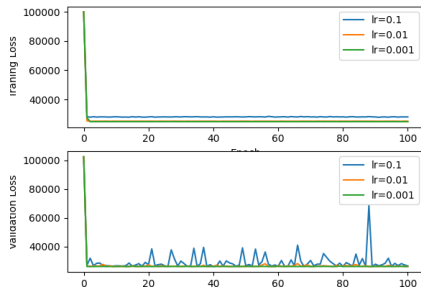
(a) Training and Validation Loss



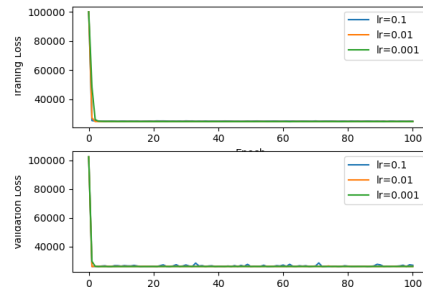
(b) Linear Regression Line(Y and X)

Learning Rate	Slope	Intercept	Epochs	Time
0.1	238.1939796861825	128.52849061959452	444	5sec
0.01	238.10180371981144	128.63585999483203	3657	10sec
0.001	237.81254561377418	128.9727966535979	29118	20sec

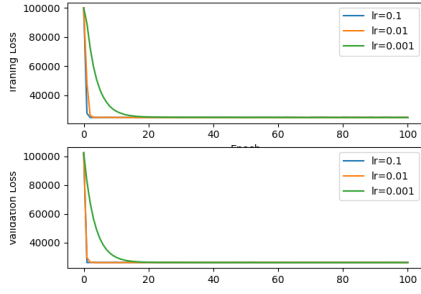
### 3 Stochastic Gradient Descent (SGD)



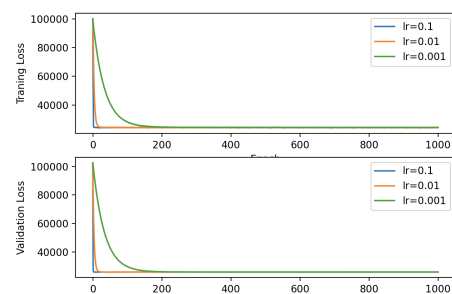
(a) Batch Size=1



(b) Batch Size=10



(c) Batch Size=100



(d) Batch Size=1000

- The plots for the SGD did not converge for the given epsilon at all the batches and all the learning rates hence the loss plots are till to the reasonable epochs.