Assignment#2 (6) part-c and part-d – Machine Learning

B.Tech – 5th Sem

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Google Colab links for code

Q6 - C
https://colab.research.google.com/drive/1gFdpcak6c4g818OtzdPAPAKShwBrgGNs?usp=sharing

Q6 - D
https://colab.research.google.com/drive/1Zhoz1dQ9QsmRh5IqWA69-3RYiyX_f88v?usp=sharing

Results Q6 - C

Using scaled batch gradient without regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[7730.872053867435, 8069.264303687423, 11077.015405893277, 18485.569122447192]
Mean absolute percentage error is: 18.30641888247704

Using scaled batch gradient with regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[5037.585668619078, 11147.667574879839, 10378.580439168689, 22647.298983883848]
Mean absolute percentage error is: 19.92701396456417

Scaled batch gradient without regularisation performs better in comparison to Scaled batch gradient with regularisation

Using Stochastic gradient without regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[18648.663069990776, 15073.501985961251, 15766.862790309351, 22357.23427068568]
Mean absolute percentage error is: 32.87903970192347

Using Stochastic gradient with regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[69852.81456771938, 196.16376268823387, 1257.4622739827178, 431.8951419159166]
Mean absolute percentage error is: 22.675518794902167

Stochastic gradient with regularisation performs better as compared to Stochastic gradient without regularisation

Using Scaled Minibatch gradient without regularisation for batch size = 20
Final coefficients are:
[6340.552295015755, 2827.87646125345, 15916.90159915714, 10968.772912396124]
Mean absolute percentage error is: 20.275262089497147

Using Scaled Minibatch gradient with regularisation for batch size = 20
Final coefficients are:
[888.9201243627547, 5168.211726125255, 17701.360814619125, 15202.387873756412]
Mean absolute percentage error is: 19.550681895981263

Scaled Minibatch gradient with regularisation performs better than Scaled Minibatch gradient without regularisation

Results Q6(d)

Using Locally Weighted Linear Regression for Tau = 5e-05
Mean absolute percentage error is: [5.40732082]

Using scaled batch gradient with regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[5037.585668619078, 11147.667574879839, 10378.580439168689, 22647.298983883848]
Mean absolute percentage error is: 19.92701396456417

Using Stochastic gradient with regularisation
Initial coefficients:
[0, 0, 0, 0]
Final coefficients are:
[68977.37183533033, 153.6672368058788, 622.1158811423422, 207.34938918615728]
Mean absolute percentage error is: 22.392602067246287

Using Scaled Minibatch gradient with regularisation for batch size = 20
Final coefficients are:
[888.9201243627547, 5168.211726125255, 17701.360814619125, 15202.387873756412]
Mean absolute percentage error is: 19.550681895981263