CSE 6363-007: Machine Learning Assignment – 1 Report

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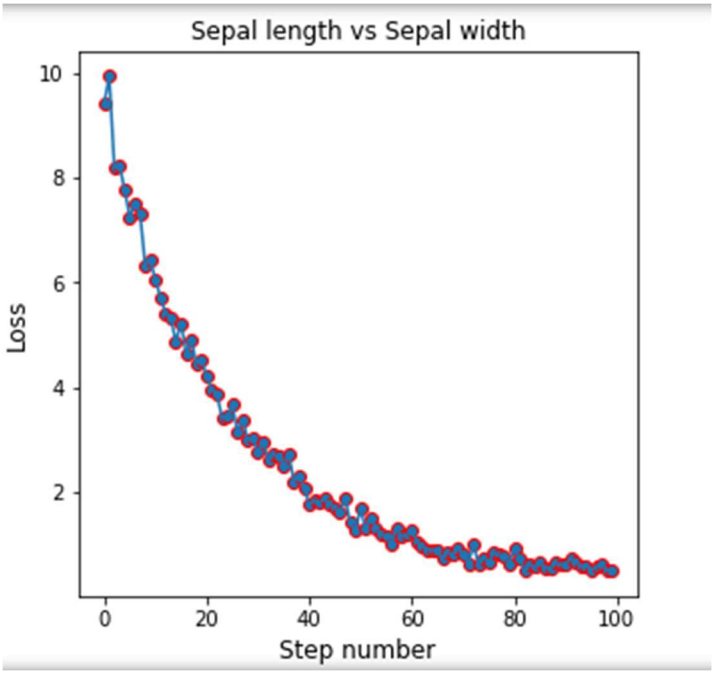
Linear Regression with mini batch gradient descent:

Training 6 selected models: The following 6 plots are plotted with loss against the step number.

Model 1: Training Sepal length and Sepal width

Weight = [0.44154908]

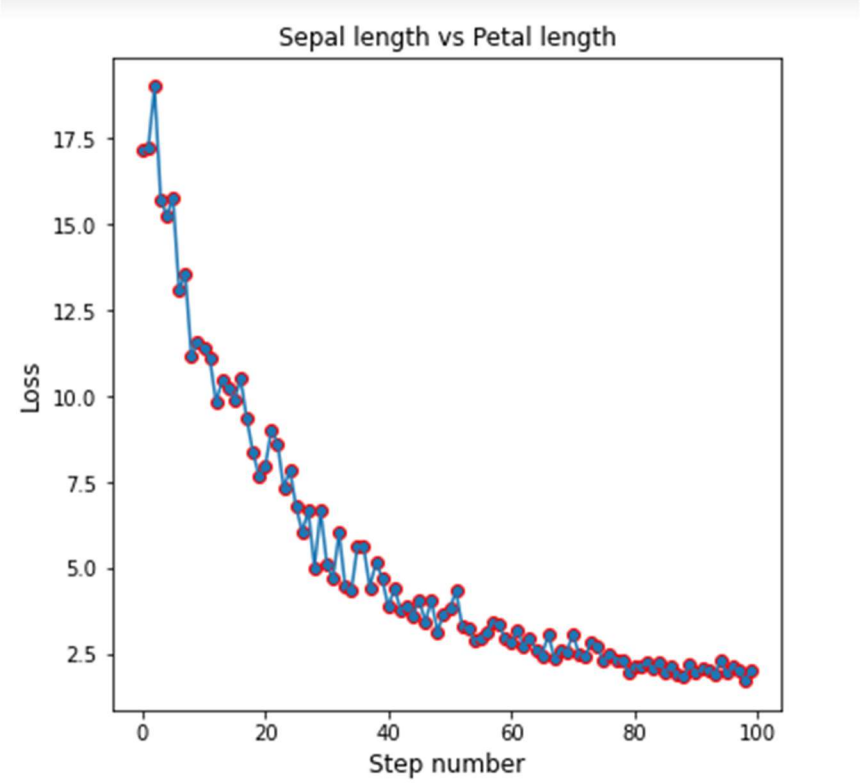
Bias = 0.07810464352663872



Model 2: Training Sepal length and Petal length

Weight = [0.57579318]

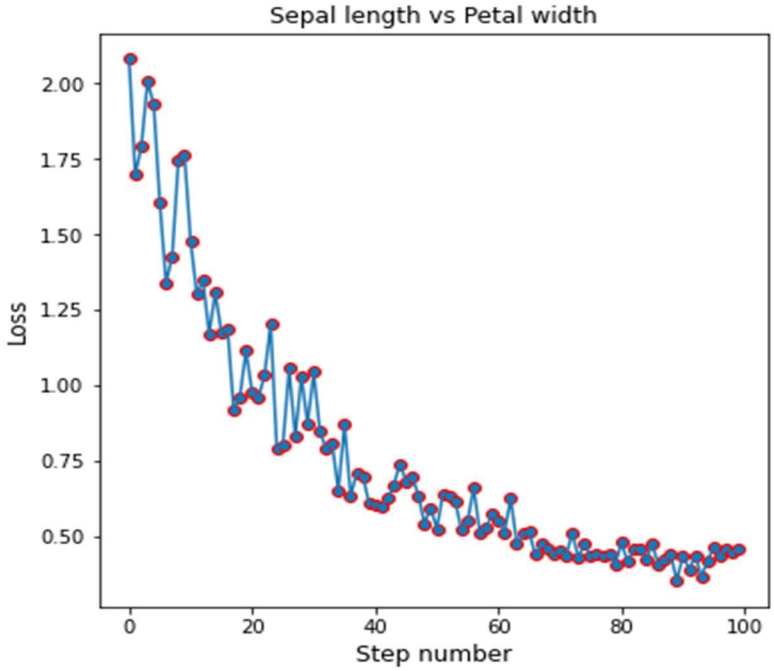
Bias = 0.08837210819277631



Model 3: Training Sepal length and Petal width

Weight = [0.18772396]

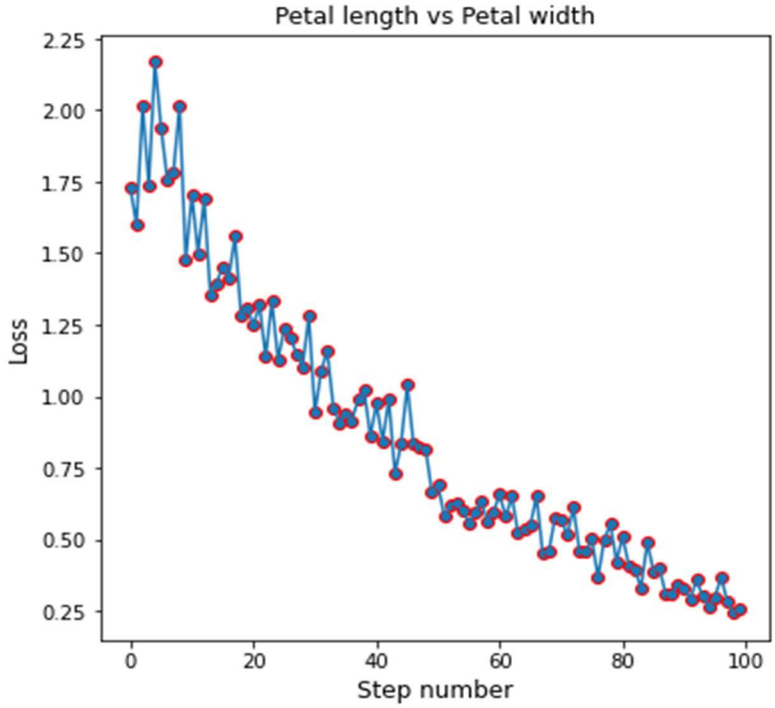
Bias = 0.027818485401681622



Model 4: Training Petal length and Petal width

Weight = [0.21382383]

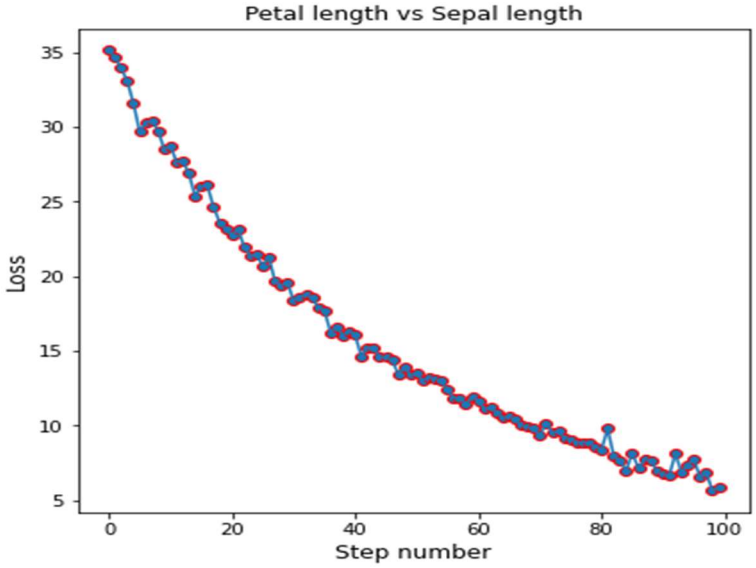
Bias = 0.0425848754945865



Model 5: Training Petal length and Sepal length

Weight = [0.85212987]

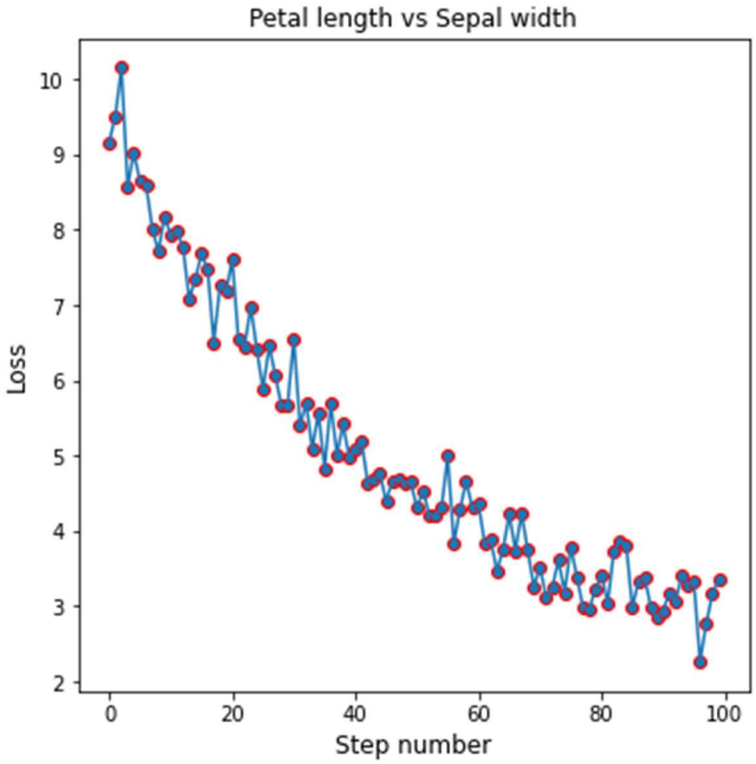
Bias = 0.227785766485147



Model 6: Training Petal length and Sepal width

Weight = [0.40948227]

Bias = 0.12432381737490135



Result: According to the test results Petal length is most effective in predicting Petal width with Mean Squared Error 0.25663803392081047

L2 Regularization for Petal length and Sepal length:

Model without regularization:

weights = [0.1826582 0.06539506]

loss without regularization -> 0.6829589990638798

Model with regularization:

weights = [0.18065681 0.06487274]

loss with regularization -> 0.6706895115996018