**CS4990 Fall 2019 Project Assignment 1**

1. **Write** a report to **analyze and discuss** the impact of different **batch sizes** on the performance of the models trained in Task 4

**Solution**:

The impact of **batch sizes** on the performance of the models trained in Task 4 is as below:

The Stochastic Gradient Descent Model produces the Mean Squared error close to the accuracy of the linear regression model from scikit-learn library when the parameter are as below,

Learning\_rate= 0.09

Epoches= 910

Batch\_Size= 32

Then,

Mean Squared Error of Test Data= 12.1456

Mean Squared Error of Train Data= 10.8207

When the batch-size is changed, the Mean Squared Error changes respectively:

* batch\_size=50

The MSE for testing data: 12.1552

The MSE for training data: 10.8210

* batch\_size=100

The MSE for testing data: 12.1592

The MSE for training data: 10.8208

* batch\_size=300

The MSE for testing data: 12.1484

The MSE for training data: 10.8207

* batch\_size=500

The MSE for testing data: 12.1486

The MSE for training data: 10.8207

* batch\_size=1000

The MSE for testing data: 12. 1486

The MSE for training data: 10.8207

As we can see, the Mean Squared Error decrease with increase in batch size and then becomes constant with batch\_size.