**Machine learning worksheet solution**

1. The computational complexity of linear regression is:

A) (𝑛 2.4 ) B) 𝑂(𝑛) C) 𝑂(𝑛 2 ) D) 𝑂(𝑛 3 )

**Answer:-B**

2. Which of the following can be used to fit non-linear data?

A) Lasso Regression

B) Logistic Regression

C) Polynomial Regression

D) Ridge Regression

**Answer:-** D

3. Which of the following can be used to optimize the cost function of Linear Regression?

A) Entropy

B) Gradient Descent

C) Pasting

D) None of the above.

**Answer:-B**

4. Which of the following method does not have closed form solution for its coefficients?

A) extrapolation

B) Ridge

C) Lasso

D) Elastic Nets

**Answer:-c**

5. Which gradient descent algorithm always gives optimal solution?

A) Stochastic Gradient Descent

B) Mini-Batch Gradient Descent

C) Batch Gradient Descent

D) All of the above

**Answer:-A**

6. Generalization error measures how well a model performs on training data.

A) True B) False

**Asnwer:-A**

7. The cost function of linear regression can be given as (𝑤0, 𝑤1 ) = 1 2𝑚 ∑ (𝑤0 + 𝑤1𝑥 (𝑖) − 𝑦 (𝑖) ) 𝑚 2 𝑖=1 . The half term at start is due to:

A) scaling cost function by half makes gradient descent converge faster.

B) presence of half makes it easy to do grid search.

C) it does not matter whether half is there or not.

D) None of the above.

**Answer:-**

8. Which of the following will have symmetric relation between dependent variable and independent variable?

A) Regression

B) Correlation

C) Both of them

D) None of these

**Asnwer:- C**

Q.11. What Linear Regression training algorithm can you use if you have a training set with millions of features?

Ans. I could use batch gradient descent, stochastic gradient descent, or mini-batch gradient descent. SGD and MBGD would work the best because neither of them need to load the entire dataset into memory in order to take 1 step of gradient descent. Batch would be ok with the caveat that you have enough memory to load all the data. The normal equations method would not be a good choice because it is computationally inefficient. The main cause of the computational complexity comes from inverse operation on an (n x n) matrix.

Q.12 . . Which algorithms will not suffer or might suffer, if the features in training set have very different scales?

Ans. The normal equations method does not require normalizing the features, so it remains unaffected by features in the training set having very different scales .Feature scaling is required for the various gradient descent algorithms. Feature scaling will help gradient descent converge quicker.