CSE 6005- Machine Learning
Lab Practice Sheet 3 (Logistic Regression)

Date of Completion : 21/02/2020, 11.59 P.M

- You are supposed to answer the following questions after doing the appropriate experiments.
- Every answer should be supported by the experiment(s) with the details: Objective of the experiment, Design of the experiment, Algorithm and the related code and the inference from the experiment.
- Choice of the data-set for any experiment is your choice, but the data set should be a multi-variate data set.
- Answer for every questions should be in the form of a report with the details of the experiments performed with justification.

1. Consider the data set $X = \{x^t, r^t\}_{t=1}^N$, where $r^t \in \{1, 0\}$, $x^t \in R$. Using any machine learning model, given an $x \notin \{x^1, x^2, ..., x^N\}$, Compute the $P(1|x)$, with two different hypothesis, without using any library function. Compare the performance measure of the two different hypotheses and conclude which hypothesis (of the two chosen by you) learns better. Your code should not compute any probability related estimates.

2. Implement a multinomial logistic regression model for a suitable data set and compute the performance measure of the model.

3. For a multivariate data set where all the input attributes are not numerical, implement the logistic regression model for learning the class of the input. Without using any library function, compute the performance measure of the learning model.

4. Implement a Regression learning model using logistic regression, for an appropriate data set.

5. Implement a binomial logistic regression learning model for a suitable data set, where input attributes are in R^2. Compute the Confusion Matrix of your model for the test data. Compute the following measure for your learning model: (i)Recall (ii)Precision (iii) Accuracy (iv) F-measure.