

BITS F464 - Machine Learning
I Semester 2019-2020
Assignment #1
Weightage: 10%
Due Date: 09th November, 2019 (Saturday)

1. Linear basis function models for Regression

- (a) Take a regression problem for which data is available (check UCI ML Repository) and try out different basis functions.
- (b) Build a Bayesian Linear Regression Model* and compare it with models developed in (a). DO a quantitative as well as qualitative comparison.

**Chapter 3 of Bishop Book on Pattern Recognition and Machine Learning. Bayesian Linear Regression is the new model you will learn through this assignment.*

You need to submit a hand-written report. Figures, tables, and graphs can be taken printed.

2. Build your first Neural Network

- (a) You are required to write a program for a Multilayer Perceptron (MLP) classifier in C or Java (no Python, no R) with 1 hidden layer. You should provision for use of different activation functions and different variants of Gradient Descent algorithms.
- (b) Generalize your code to work with any number of hidden layers.
- (c) Test your code using one binary and one multiclass classification problem.
- (d) Compare accuracies using different activation functions and different variants of Gradient Descent. (using 1 hidden layer only)

Objectives: To understand the intricacies of Neural Networks and to get some insights into the working of deep neural networks.

Group Information:

Max. 03 students are allowed per group. NO RELAXATION!

Navneet Goyal
goel@
6121-K, NAB.