# Linear Regression Analysis

## Data-set

The data-set and it's description can be found at this URL- **https://archive.ics.uci.edu/ml/datasets/Combined+Cycle+Power+Plant.** The task is to predict the EP(power consumption) values and the loss over a test set. Taking the test set to be the last 2000 examples in the data-set, with the rest of examples used for training the model.

## Part A: Normal Equations Method

Refer to the section 3.1.1 (Equations 3.15-3.17) of Pattern Recognition and Machine Learning by Christopher Bishop.

## Part B: Gradient Descent Method

Taking loss function to be half the sum of squared errors over the training set. Minimizing the loss function using Gradient Descent by choosing an appropriate learning rate and stopping criteria.

## Part C: Gradient Descent with Regularization

Performing L1 and L2 regularization. Using a part of the training data for validation purpose & determining the most optimal regularization coefficient.