M.Sc. Assignment

Non-Linear Regression Analysis

Due date is 12.04.19, 7 p.m. NO EXTENSION. NO CONSULTATION WITH YOUR FRIENDS. IF I FIND SIMILAR COPIES BOTH WILL GET 0

1. Consider the Data-1, which is of the form $(t, y(t))$. Try to fit the following model to the given data set:

$$y(t) = \alpha_1 e^{\beta_1 t} + \alpha_2 e^{\beta_2 t} + \epsilon(t).$$

Here $\epsilon(t)$ is a sequence of $i.i.d.$ random variable with mean zero and finite variance.

1. Plot the data.
2. Can you find real solution using Prony's equations?
3. Plot the contours.
4. Estimate the unknown parameters using Newton Raphson or Gauss Newton method.
5. Estimate the unknown parameters using Osborne's method.
6. Plot the predicted curve.
7. Plot the errors.
8. Find the confidence intervals of the unknown parameters. the number of components using cross validation approach.