Class Exercise 1

Consider the simple linear model, $y = \theta_1 x_1 + \theta_2 x_2 + \theta_{22} x_2^2$. Use the data (Data_class.mat) to fit the parameters $\theta_1, \theta_2, \theta_{22}$ using the linear LSQ formula.

Class Exercise 2

Consider a simple nonlinear model with two parameters,

$$y = \frac{x}{e^{(\theta_1 + \theta_2 x)} + 1}.$$

Make the model linear and use the data below to fit the parameters θ_1, θ_2 using the linear LSQ formula.
X = [5 7 11 12 15 17 19]
Y = [1.83 2.53 3.87 4.20 5.14 5.75 6.35]

Class Exercise 3

Consider a simple nonlinear model with two parameters, $y = \theta_1 x^{\theta_2}$. Make the model linear and use the data below to fit the parameters θ_1, θ_2 using the linear LSQ formula.
X = [1:3:9, 11 14 19 21 23]
Y = [2.04 128.01 686.04 2662.01 5488.01 13718.07 18522.07 24334.07]

Class Exercise 4

Consider a simple nonlinear model with two parameters,

$$y = \frac{\theta_1 x}{\theta_2 + x}.$$

Make the model linear and use the data below to fit the parameters θ_1, θ_2 using the linear LSQ formula.
X = [1:2:8, 9 13 17] Y = [2.00 3.60 4.29 4.67 4.91 5.20 5.37]