Machine Learning (ECE 4850)

Instructor: Dr. Shekaramiz

Submission Type: Online, Canvas

Reading: Materials we learned in class and regression using least-square error method.

In this homework, you are asked to perform some simple tasks using MATLAB/PYTHON. The commands that I use here are based on MATLAB.

The Bitcoin data (BTC-USD) in given to you ('BTC-USD.xlxs'). The data is from 1/1/2017 to 1/6/2023. We focus on the closing price of this stock. This data will serve as the population.

a) Compute the mean and variance of the population.
b) Plot the histogram of the population (set the length of bins to 30 days). Discuss what it shows.
c) Normalize the histogram data.
d) Plot the population (Matlab ocmmand: plot(x,y,'o')). Use appropriate labels for the x- and y-axis (x demonstrates the day (eg., 1, 2, …) or time-stamp and y-axis shows the closing price). In the title of this figure, state when is the starting and ending date of your data.
e) On the same figure, show the population mean with a red line .
f) Predict the average closing price of Bitcoin for **Feb. 15, 2023** based on the collected data using any regression model that you can come up with and solve it using the least-square error method. Justify your proposed model.
g) Submit your codes along with a technical report that contains an introduction about the project, a section on the results (with figures), and a conclusion section.
h) Prepare a set of slides with your teammate (if you have any) and be prepared to present your work in class for 10 minutes.

Good Luck