**Chapter 8: Time series**

**Time Series Analysis - Exercise**

The Planning Director approached the Data Science team to examine the feasibility of a joint project.

The commander wants to know what the overall fuel consumption will be per day in advance, and through this information, to reduce fuel transportation costs.

The PD has linked you to an experienced DCO who does these calculations every day and tries to estimate the total amount of fuel the next day but without success.

The DCO is very sure there is a connection between the amount of fuel measured in the previous days and the amount measured tomorrow, but can not model it.

In order to conduct an initial feasibility study, the CSV provided us with overall jet fuel 2008-2016.csv, which includes the total fuel consumption per day between 2008-2016 in liters.

1.Is it possible to predict total fuel consumption from 20.10.15 or later for the given series?

2.If not - explain, use terms such as stationary, ACF PACF test Dicky Fuller, etc.

3.If so - given one test group (from 20.10.15 onwards), how often do you think the model should be updated with new values if it is known that the RMSE has to be less than 1 liter?

Provide a graph describing the original series against your predicted value and RMSE (Root Mean Squared Error)

4.Bonus - Create a dynamic forecast for the series values, provide a graph describing the original series against your predicted value and RMSE

There is alot of material on the subject in this folder, see example for the function used in <https://github.com/amyple/TimeSeriesAnalysiswithPython>.

Fourier

Recommend that you go through the following series of things: (including videos for

experienced hikers) and then go over the presentation that comes with the "speech recognition

" attached to it.

It is important to understand this main idea of this components dissmantle and "frequency

Space", and in addition to its computational significance when it comes to digital information-

DFT and the other artificats that it adds to the theoretical idea.

Please download the presentation and do not view it in the Google Viewer:

<https://medium.com/sho-jp/fourier-transform-101-part-1-b69ea3cb4837>

<https://medium.com/sho-jp/fourier-transform-101-part-2-complex-fourier-series-934a885b3921>

<https://medium.com/sho-jp/fourier-transform-101-part-3-fourier-transform-6def0bd2ca9b>

<https://medium.com/sho-jp/fourier-transform-101-part-4-discrete-fourier-transform-8fc3fbb763f3>