R programming and applications

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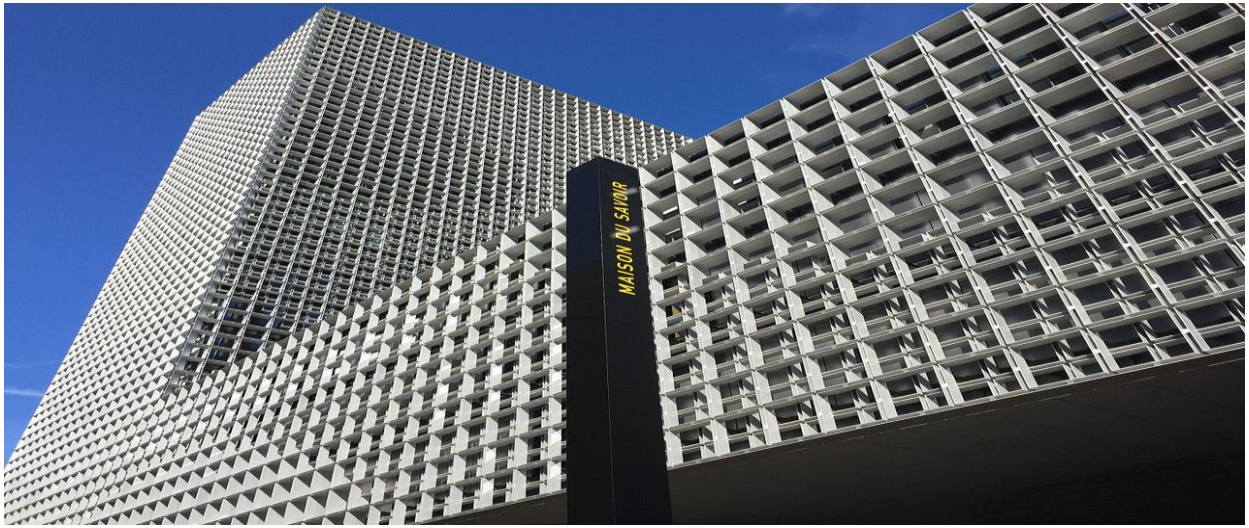

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Master's evaluation:final report

Instructions

- Do the exercises in a right order.
- The entire program in R should be written (in annex). Use only functions studied in class.
- Explain carefully the steps in your reasoning.
- Give all the graphs, the interesting results of programs, and comments in the text.
- December 5: Post the pdf file on moodle before 17:00 p.m.

Exercise 1

Name	Series
Adrovic Amila	Fund1
Asgari Mohsen	Fund2
Bovery Ruben	Fund3
De Leonardis Matteo	Fund4
Estanqueiro Catarina	Fund5
Klimenko Maksim	Fund6
Schaaf Emanuel	Fund7
Vassalo Simone	Fund8

Exercise 1

We consider a fund data series From the file 8 Funds.csv

1. Open the data series and summarize its characteristics.
2. Represent graphically the data set.
3. Is the series stationary? Explain.
4. What kind of process you have?
5. Write the following models and explain which ones are relevant for your data series?

   - MA(1)
   - AR(1)
   - MA(2)
   - ARMA(1,2)

Exercise 2

We consider the monthly adjusted closing price data on Microsoft (MSFT) from January 2010 to March 2020.

1. Estimate a simple smoothing average using k=10 and represent the original series and the smoothed series.
2. Decompose the series using an additive scheme and plot the adjusted series.
3. Use an exponential Holt filter to smooth the series and represent the holt Winters filtering.
4. Prediction using n.ahead=10 using the function predict and the function forecast.
5. Diagnostics tests on the errors of forecasts.

Exercise 3

We consider the file C7ex5 from the reference book: Analyse des séries temporelles, Dunod, 5iéme édition, 2022 (R. Bourbonnais, V. Terraza)

1. Descriptive Analysis of the data series.
2. What are the stochastic properties of ser1,ser2 and ser3?
3. Determine if ARMA processes are relevant of all the data series.
4. Analyse the Residuals of the models estimated and if relevant give a prediction of the models for 5 periods.
5. Interpret all your results.