

TIME SERIES ANALYSIS

FIRST MIDTERM 03/12/20

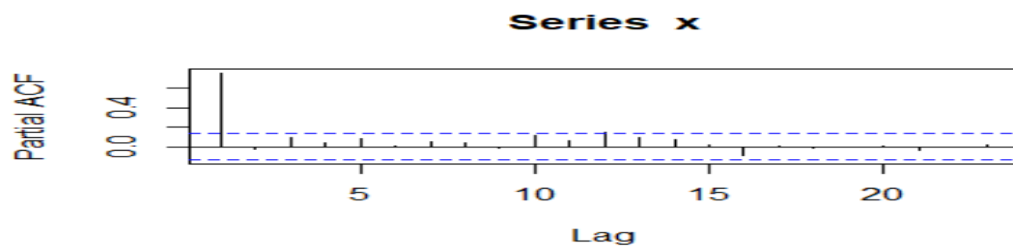
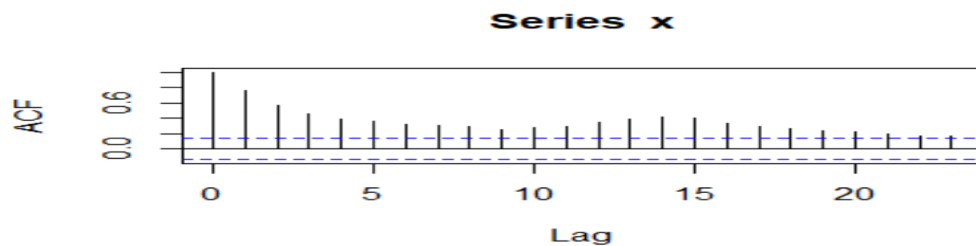
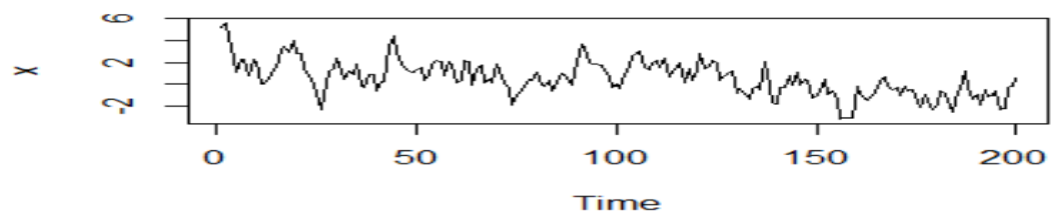
0.1. Short theoretical questions. (4 points.)

1. (2 points) What is the invertibility condition in MA(q) models? In which sense is related with the identification of an unique model?
2. (2 points) Compute the unconditional mean, the unconditional variance and the first three lag correlation coefficients for the following models:
 - $X_t = a_t$
 - $X_t = 0,7X_{t-1} - 0,7X_{t-2} + a_t$
 - $X_t = a_t - 0,8a_{t-1}$
 - $X_t = 0,7X_{t-1} + a_t + 0,3a_{t-1}$

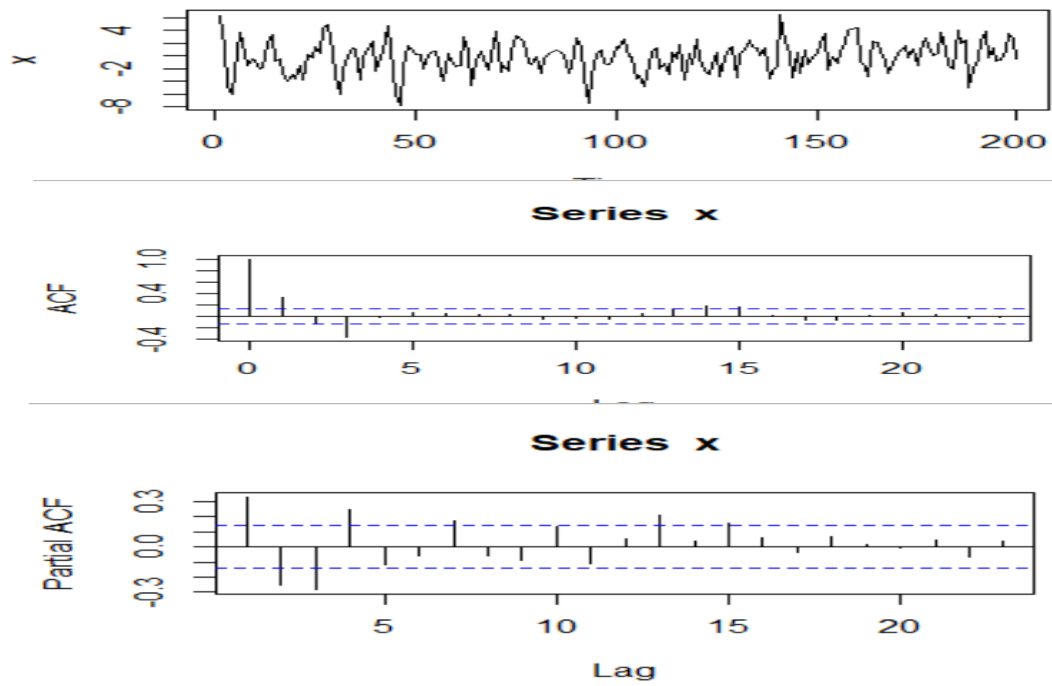
0.2. Exercises (6 points).

1. (2 points each) Identify the p and q orders of the ARMA(p,q) models that best describe the following examples and simulate a new process with similar characteristics.

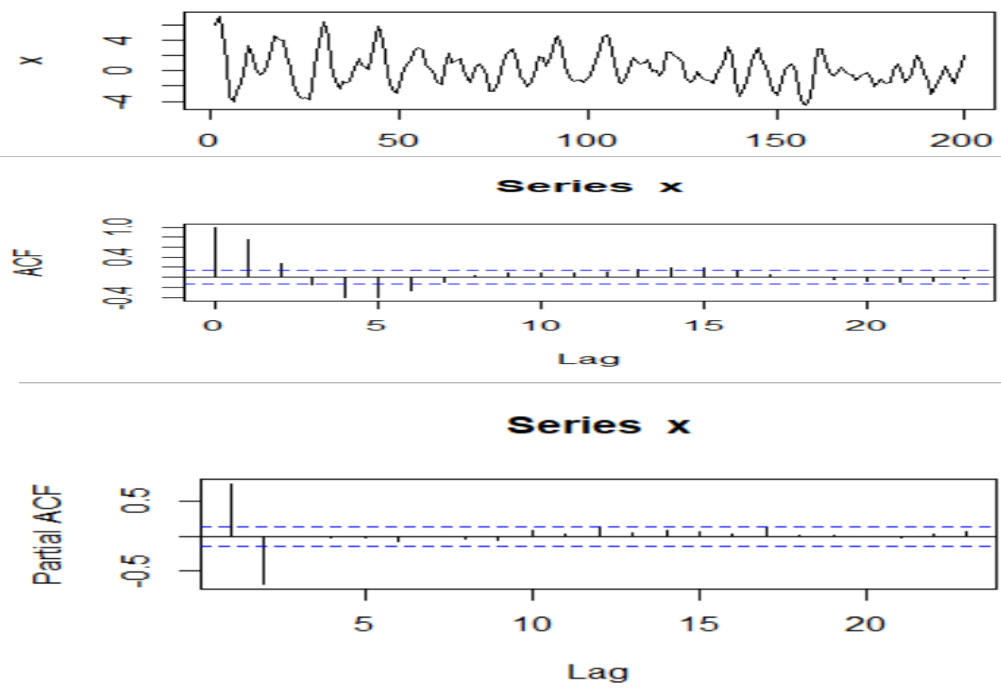
EXAMPLE 1:



EXAMPLE 2:



EXAMPLE 3:



Instructions

- The exam is open book. It means that you can use any material (slides, your own notes, internet). Only condition is that the exam should contain nothing literally copied from any source, use your own words to explain the ideas.
- The exam is intended to be solved individually and I will monitor possible cases of plagiarism.
- Questions can be answered in a rather short way, but in the grading I will value originality, relation with other concepts, references, examples, self thinking...