BANA7050 Forecasting and Time Series Methods Homework 3 (Case Study #1)

Case study

The data is monthly bituminous coal production in the US from January 1952 through December 1959, a total of 96 observations. The data is seasonally adjusted (i.e., no need to consider seasonality).

47730 46704 41535 41319 36962 32558 31995 32993 44834 29883 39611

40099 38051 36927 37272 39457 38097 40226 43589 39088 39409 37226

34421 34975 32710 31885 32106 30029 29501 31620 34205 32153 32764

33230 35636 35550 34529 37498 37229 36021 38281 36676 44541 40850

38404 37575 41476 42267 43062 45036 43769 42298 44412 40498 37830

42294 38330 43554 42579 36911 42541 42430 43465 44468 43597 40774

42573 41635 39030 41572 37027 34732 36817 34295 33218 32034 31417

35719 30001 33096 35196 36550 33463 37195 34748 36461 35754 36943

35854 37912 30095 28931 31020 31746 34613 37901

For such a data set, assume stationarity (i.e., no need to check for nonstationarity), build an ARMA model, perform data transformation (only if needed), model identification, model selection, diagnostic checking, parameter estimation, and forecast the next two years (24 observations). Write a short report summarizing your results, but **no longer than 5 pages**.

**Instructions on the Case Study:**

Your report should contain a discussion of: (1) data visualization; (2) the identification of the model to be fit together with your rational based upon the appropriate plots and outputs; (3) estimation of the model parameters and interpretation of significance of the parameters; (4) diagnostic checking on residuals and possible revision to your model choice; (5) forecasts for the period in question.

In your report, please embed the code and corresponding outputs in the report (just like the way the lecture notes are written), interpret your outputs, and write a brief discussion.