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## Homework 2 - ARIMA modeling

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Course: STP 598 - Time Series (Class # 12767)

Semester: Spring 2022

Due date: 12pm, February 28th, 2022.

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### **Part I - Solving Tsay's (2010) problem 2.15, page 107<sup>1</sup>**

*The quarterly gross domestic product implicit price deflator is often used as a measure of inflation. The file `q-gdpdef.txt`<sup>2</sup> contains the data for the United States from the first quarter of 1947 to the last quarter of 2008. Data format is year, month, day, and deflator. The data are seasonally adjusted and equal to 100 for year 2000. Build an ARIMA model for the series and check the validity of the fitted model. Use the fitted model to predict the inflation for each quarter of 2009. The data are obtained from the Federal Reserve Bank of St Louis.*

### **Part II - Updating the data up to the 4th quarter of 2021**

Download the up-to-date quarterly gross domestic implicit price deflator time series from the Federal Reserve Bank of St Louis<sup>3</sup>. Fit the ARIMA models from Part I with data up to the 4th quarter of 2020 (2020.IV) and use 2021.I to 2021.IV (4 quarters) for forecasting comparisons.

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<sup>1</sup>Tsay (2010) Analysis of Financial Time Series, Third Edition. Wiley-Interscience, Probability and Statistics.

<sup>2</sup><https://faculty.chicagobooth.edu/-/media/faculty/ruey-s-tsay/teaching/fts3/q-gdpdef.txt>

<sup>3</sup> <https://fred.stlouisfed.org/series/GDPDEF>