

STAT 497

QUIZ 1

(Due: December 12, 2024, Thursday, 11:59 pm)

- *You should work on your own. Please feel free to get help from me, but not from anyone else. Let me know if my wording in the questions is not clear.*
- *Please ensure that you show all the details of your solution.*
- *Late submissions for the quiz will not be accepted.*
- *Ensure you provide detailed solutions and interpretations for all results.*
- *Upload both the "Rmarkdown" file and the "HTML" file to ODTUCLASS.*

QUESTION:

For this quiz, you will work with the **jj_ts** dataset from the **timeSeriesDataSets** package in R. The "jj_ts" data represent **quarterly** earnings per share (EPS) of Johnson & Johnson in dollars. The dataset contains quarterly observations starting from 1960 and ending in 1981.

- (5 pts) Plot the series, draw ACF and PACF plots. Interpret the plots in terms of trend and seasonality.
- (5 pts) Split the data into train and test set. (You should take last 8 observations as test set)
- (15 pts) Check the stationarity of the series. If it is not stationary, make it stationary.
- (15 pts) If there is seasonal unit root in data, remove the seasonal unit root and evaluate the unit root tests you applied. Interpret your results.
- (20 pts) Identify a proper ARMA, ARIMA or SARIMA models.
- (10 pts) Find the best model and interpret the results.
- (20 pts) Apply Diagnostic Checking. Interpret the results.
- (10 pts) After deciding the model, obtain forecast values from the model and calculate accuracy. Interpret the accuracy of the model.