

**STATS 326**  
**Applied Time Series**  
**ASSIGNMENT FOUR**  
**Due: 14 May 2020, 12.00**

**Worth 6% of your final grade (727 4%)**

**Hand-in to the appropriate STATS 326 Hand-in box in the Student Resource Centre**

This assignment will be marked out of 100. Please follow the instructions carefully. Marks will be deducted if you include **R** output, plots etc that are not asked for. You are encouraged to print your assignment “2-up” to save paper.

The data for this assignment is contained in a text file called “A4.Data.txt” that can be downloaded from Canvas. The 5 univariate Time Series variables in that file are called TS1, TS2, TS3, TS4 and TS5. You do not need to create a time series object in **R** for the variables in this assignment.

For each of the following 5 questions you are required to find the best Stationary Time Series Model for the specified series. Your answer to each question should include:

- (i) A plot of the time series, a plot of the acf and a plot of the pacf. [3 marks]
- (ii) The equation of the model you think is most appropriate, given the plots. Justify your choice of model. [4 marks]
- (iii) The **R** output and the estimated equation of your model. [4 marks]
- (iv) A Time Series plot of the Residual Series and a plot of the acf of the residuals. Briefly comment on the plots. [6 marks]
- (v) Check to determine whether there is a better stationary model for the time series. Only include any additional **R** output (as in (iii) – (iv) above) if you find a better model. Otherwise, just say which models you tried (e.g. AR(3), ARMA(2,1), etc), report their AIC value(s) and explain why they were rejected. Only try “sensible” models given what you found in the plots in part (i). [3 marks]

**Question One:** (20 marks) Use the Time Series: TS1

**Question Two:** (20 marks) Use the Time Series: TS2

**Question Three:** (20 marks) Use the Time Series: TS3

**Question Four:** (20 marks) Use the Time Series: TS4

**Question Five:** (20 marks) Use the Time Series: TS5