Time Sereies Analysis Summer 2016

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Requirement

1. Write your assignment using R Markdown.

2. Deadline and submission to announce later.

Model and data description

- Series J data from Box and Jenkins (1976) contains the gas rate and the percentage CO2 in the gas.

- We aim at fitting the gas and furance data using the distributed lag model

$$co2_t = \alpha + \sum_{i}^{s} v_i \cdot gas_{t-i-b} + e_t, (1)$$

- where e_t is serially correlated.

- The first six observations of the data set and the time series plots of CO2 and Gas series are shown below.

```
##    InputGasRate  CO2
## 1        -0.109 53.8
## 2         0.000 53.6
## 3         0.178 53.5
## 4         0.339 53.5
## 5         0.373 53.4
## 6         0.441 53.1
```
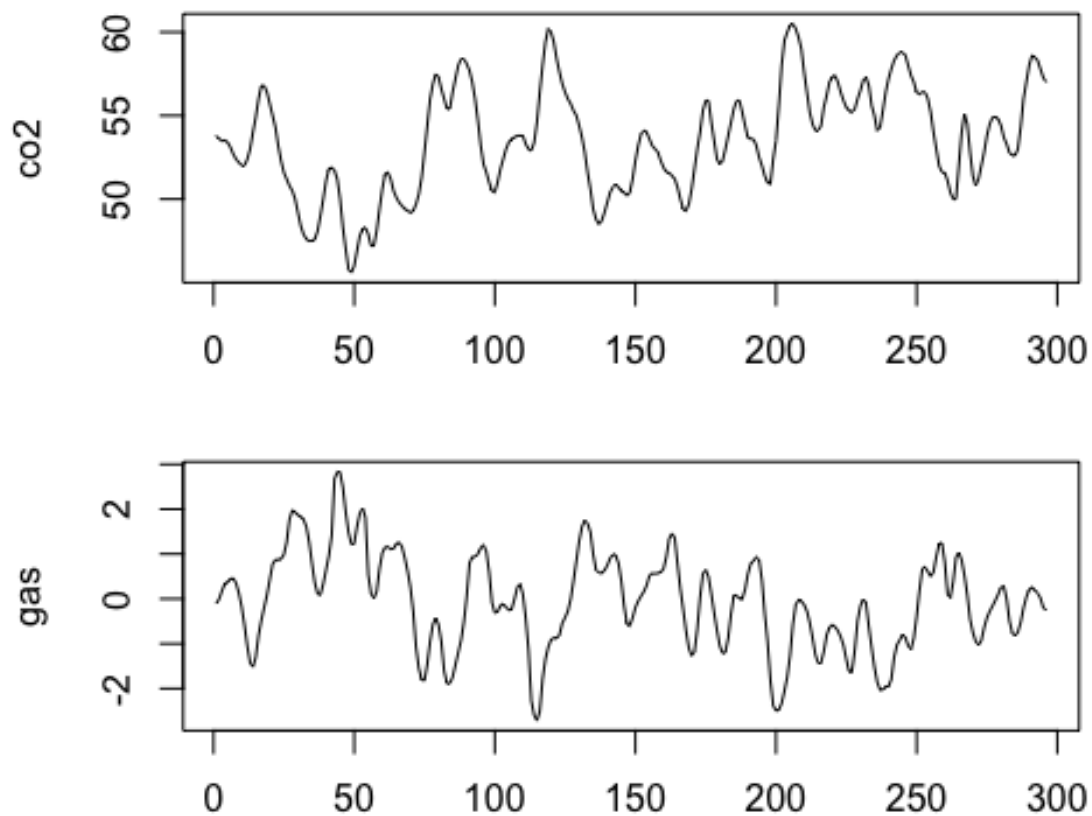
Question

1. **Use the ideas of prewhitening taught in class to identify b and s.** (Hint: assume that the gas series follows an AR(5) model and use 'filter' function in R)

2. **Fit Eqn. (1) based on your preliminary identification and R arima function** (Hint: You could select a different model if some model parameters are insignificant or model is inadequate)

3. **Checking model adequacy of your fitted model.**