Homework 5
ECON 686

This homework will **not** be turned in. It provides practice for the exam and should take from one to two hours to complete, depending on how well you have kept up with the material over the last month.

You will find monthly data on oil and gasoline prices in your RStudio Server directory. The files are named `oilprice.csv` and `gasprice.csv`. They are monthly observations covering many years.

1. If the goal is to forecast gasoline prices, why would you want to account for what is happening to the price of oil? Do you expect oil prices and gas prices to be positively or negatively correlated?
2. Take the *seasonal difference* of both variables. Is it more natural to take the percentage change or the difference when doing this?
3. Estimate an AR(1) model of the seasonal difference of the price of gas. Make forecasts for the next three months after the end of your sample.
4. Estimate a VAR(1) model of the seasonal difference of the prices of gas and oil. Make forecasts of the gas price change for the next three months after the end of your sample. Are these forecasts similar to those in (3)? What does this tell you?
5. Do a scenario analysis where the price of oil *rises by 50%* the month after your sample ends, and is then unchanged forever after. Compare the forecast of gasoline prices with the case where the price of oil *falls by 50%* the month after your sample ends.
6. Do you think the results in (5) make sense in terms of sign and magnitude?

You will find the files `testdata1.csv` and `testdata2.csv` in your RStudio Server directory. You can read them in using

```
testdata1 <- read.csv("testdata1.csv", header=TRUE)
testdata2 <- read.csv("testdata2.csv", header=TRUE)
```

7. Insert the data from both of those files into a new SQLite database from R, using the methods from the lecture. Put each in its own table.
8. Write a query to print out only the names of everyone over age 30.
9. Do a join and then print out the average income of people over 30.