

Linear Regression Models
Statistics GR5205/GU4205 — Fall 2020

Homework 1

The following problems are due on Tuesday, September 28, 11:59pm.

1. R exercises

In economics, we believe that low unemployment will lead to higher inflation. The reasoning being that labor is hard to find so employers need to attract workers with higher salaries. With higher salaries, people are willing to pay more for goods and therefore leading to inflation. We will roughly validate this theory at the US national level at a very coarse time scale. You are not expected to have taken an economics class to do this assignment.

Download the data `unemployment_cpi_unempl_2000_2020.json` in HW1. This is a dataset from the Bureau of Labor Statistics regarding inflation and unemployment.

(a) Standardizing the dataset. Please read in the JSON data and export a CSV file with the following columns:

- year
- period: this should take on values between “1st Half” or “2nd Half”
- unemployment: this should be an average percentage over the appropriate months
- cpi: this shouldn’t need much processing

Hint: if you haven’t seen a JSON file before, here’s some sample code for R:

```
library(jsonlite)
data <- read_json("MYFILE.json")
class(data)
```

(b) Calculate the inflation rate and add a column to your data named inflation. For example, the inflation rate for 2000, 2nd Half should be

$$(170.2 - 167.6)/167.6 * 100 = 1.55\%.$$

If an inflation cannot be calculated, please replace the value with NA.

(c) Plot the scatter plot between the inflation and unemployment rate with the axes labeled with units. Inflation should be on the y-axis.

2. Read the articles in the provided links below (direct click on the url):

- Accuweather: <https://www.zdnet.com/article/accuweather-caught-sending-geo-location-data-even-when-denied-access>
- Deep Fakes: <https://www.lawfareblog.com/deep-fakes-looming-crisis-national-security-democracy-and-privacy>
- Facial Analysis: <https://www.nytimes.com/2018/06/21/opinion/facial-analysis-technology-bias.html>
- Google: <https://www.theguardian.com/technology/2016/oct/21/how-to-disable-google-ad-tracking-gmail-youtube-browse>

- (a) What are the potential unethical things related to the researches mentioned in the news?
- (b) Were the collections of data justified? Should researchers use data collected in similar manners?
- (c) Please share us your opinion on the data collection procedure.