ECON 0150 | Spring 2026 | Homework 1.3

Due: Friday, January 30 at 5PM

Homework is designed to both test your knowledge and challenge you to apply familiar concepts in new applications. Answer clearly and completely. You are welcomed and encouraged to work in groups so long as your work is your own. Submit your figures and answers to Gradescope.

Q1. US Economic Growth

The dataset `us_real_gdp.csv` contains annual US Real GDP (in trillions of dollars) from 1970 to 2023.

a) What is the data structure of this dataset?

b) Create a line graph of US Real GDP over time.

c) Describe the overall trend. Are there any periods where the trend changes noticeably?

Q2. US Economic Growth Rates

Use the same `us_real_gdp.csv` dataset to create a new column that calculates the **annual growth rate** of Real GDP. The growth rate formula is:

$$g_t = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \tag{1}$$

a) Create a line graph of the growth rate over time.

b) In which years did the US economy shrink (negative growth)? What might explain these periods?

c) What is the average growth rate over this period?

Q3. Seasonal Patterns in Coffee Prices

The dataset `Monthly_Coffee_Prices.csv` contains monthly coffee prices from 1973 to 2025.

a) Create a multi-boxplot of coffee prices grouped by month.

b) Which month has the highest median price?

c) Which months show the most price variability (largest range)?

d) Based on your multi-boxplot, is there a clear seasonal pattern in coffee prices? Explain in one sentence.

Q4. Choosing the Right Visualization

You've now created line graphs (Q1-Q2) and a multi-boxplot (Q3).

a) If you wanted to know whether coffee prices are higher today than in 2000, which visualization would you use?

b) If you wanted to know whether coffee prices tend to be higher in certain months, which visualization would you use?