ECON 0150 | Fall 2024 | Homework 2

Due: Friday, Sept 20

Homework is designed to both test your knowlege 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. Use the datafiles to answer the following questions. Then submit your figures and answers to Gradescope.

Q1. Marriage Rates

The following questions are based on **crude marriage rates** — numbers of marriages per one thousand inhabitants — in 1990 and 2019. Each row represents a different European country.

a) Create a new column of absolute change in marriage rates from 1990 to 2019. The **absolute change** between two values is the result of subtracting the old value from the new value. Which country in this dataset has the largest absolute change between these years (*Hint: do not take an absolute value; positive is greater than negative.*)?

b) How many countries in this dataset experienced an increase in their marriage rates between 1990 and 2019?

c) Create a new column of relative change in marriage rates from 1990 to 2019. The **relative change** between two values is the ratio resulting from dividing the absolute change by the old value. Which country in this dataset has the largest relative change between these years?

Q2. Amazon Book Sales

We'll explore the list of 50 bestselling Amazon books each year between 2009 and 2021. Prices are expressed in US dollars and rounded to the nearest dollar. (*Hint: Use the Excel command =SUBTOTAL(103, G:G) to count rows in a sorted table, where column G is the column you're interested in counting.*)

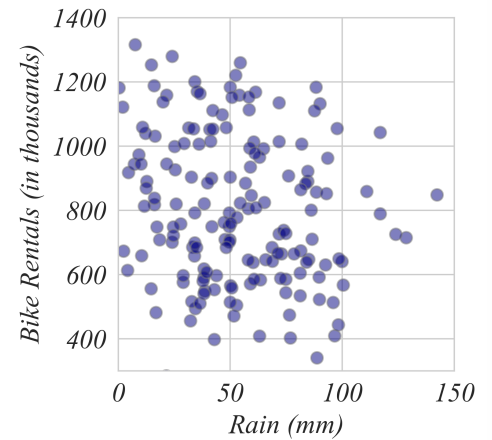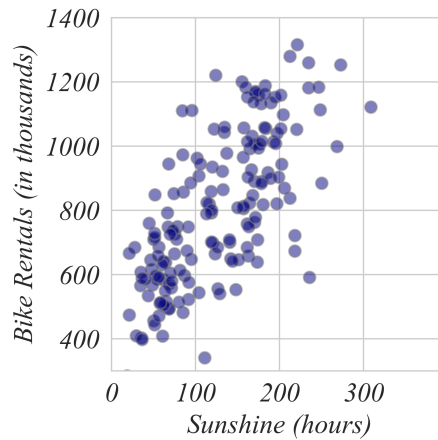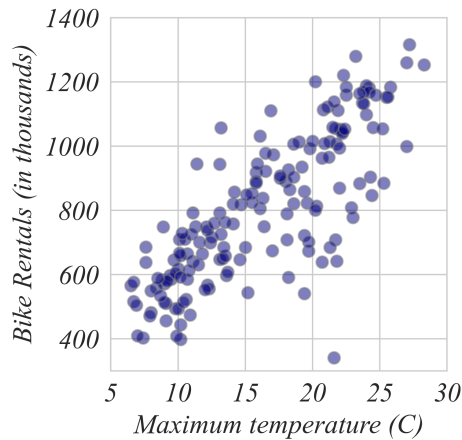a) How many bestsellers are fiction books?

b) How many nonfiction bestsellers cost more than 50 dollars?

c) How many bestsellers from after 2015 didn't cost anything?

d) Use the 'Median Price' column to construct a new column of book price relative to the average bestseller price that year. How many books are cheaper than the average bestseller that year?

Q3. Bike Hires and Weather

In the following questions, we'll analyze a data set that includes the monthly number of bike hires in London as well as monthly weather data: minimum and maximum temperature in degree Celsius, rain in millimeters, and hours of sunshine.

a) From the list below, how much did it rain in the month with the largest number of bike hires?

- 7.6 mm
- 27.6 mm
- 137.6 mm
- 157.6 mm

b) When were bikes most popular?

- In very sunny months
- In moderately sunny months
- In cloudy months
- Sunshine and bike hires were not strongly related

c) In months with what maximum temperatures were bikes most popular?

- Between 5 C and 10 C
- Between 15 C and 20 C
- Between 25 C and 30 C
- Maximum temperature and bike hires were not strongly related