Homework №5

Math 107, Spring 2016 Due: April 15 by 4:00 pm

Problem 1

Pew conducted a public opinion poll from July 18 through September 30, 2013 where 6,224 Americans ages 16 and older across the United States were contacted by telephone (either landline or cell phone) and asked the question, "If your local public library closed, what impact would that have on your community as a whole?" 63% of the people contacted answered that it would have a major impact on their community as a whole, 27% answered it would have a minor impact, 7% answered impact, and 3% didn't know. The poll has a margin of error of plus or minus 1.4 percentage points.

(a) Identify the population.

(b) Identify the sample.

(c) What are the cases?

Problem 2

The 2010 General Social Survey asked the question, "After an average work day, about how many hours do you have to relax or pursue activities that you enjoy?" to a random sample of 1,155 Americans. The average relaxing time was found to be 1.65 hours. Determine which of the following is a case, a variable, a sample statistic, or a population parameter.

(a) An American in the sample.

(b) Number of hours spent relaxing after an average work day.

(c) 1.65.

(d) Average number of hours all Americans spend relaxing after an average work day.

Problem 3

Climate change is a hot topic these days. One of the factors that may explain increases in global temperatures is the amount of carbon dioxide in the atmosphere. Annual atmospheric carbon dioxide (CO2) concentrations measured as parts per million by volume (ppmv) are derived from air samples collected at Mauna Loa Observatory in Hawaii. Additionally, we have data on median global temperature (in $^\circ$C) anomaly from 1959 to 2014. The global temperature anomaly is calculated as the deviation from the average global temperature between 1961 and 1990. The data can be found in the file `climate.csv`.

(a) What is the explanatory variable?

(b) What is the response variable?

(c) Using R, create a scatterplot of the data and briefly describe the relationship between temperature anomaly and CO2 concentration.

(d) Using R, calculate the correlation between temperature anomaly and CO2 concentration.

(e) If the temperature anomaly were recorded in degrees Fahrenheit rather than degrees Celsius, how would the correlation change? Explain your answer.