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Homework 2:
Advanced Data Analysis in Python

Research question: How does ease of doing business affect GDP per capita?

Hypothesis: A higher score of ease of doing business makes the country more attractive to companies. These companies prefer to build or extend their businesses in places where it is easy to do business. Besides, a higher ease of doing business supports the entrepreneurial spirit and makes the country end up with even more companies. Such attractiveness for businesses increase the business activities and result in increased GDP per capita.

***H_0** = There is no statistically significant relationship between ease of doing business and GDP per capita*

To test the hypothesis, I have gathered data for all the countries using World Bank Database API.
A simple linear regression is applied to the data to see any linear relation between the outcome variable (GDP per capita in US$) and the input variable (ease of doing business).

$$h(x) = \alpha + \beta x$$

Where $h(x_{\$})$ is the predicted response value. α and β values as well as standard error for beta are found as the following according to the model:

$$\alpha = -151.58$$

$$\beta = 534.31$$

$$SE(\beta) = 52.87$$

With given standard error, 95% credible interval for the β value is found as:

$$CI_{0.95} = [430.69;637.92]$$

Result: Since 95% confidence interval does not contain 0, null hypothesis is rejected. There is a statistically significant linear relationship between ease of doing business and GDP per capita according to the simple linear regression model.