**Ayça Avcı**
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**QMBU450**
**HW #2:**

**Question:** What is the correlation between GDP per capita and unemployment rate?

**Hypothesis:** Countries with higher GDP per capita have more economic power and higher standard of living. So, if GPD per capita higher in a country, it implies that total unemployment rate will be less in percentwise.

**Prediction:** GDP per capita and unemployment, total (% of total labor force) will have a simple linear relation.

To test the hypothesis, below data is gathered for all the countries around the world from the World Bank Database API:

1. GDP Per Capita (Current US$)
2. Unemployment, total (% of total labor force) (modeled ILO estimate)

Since the World Bank Database does not have all the countries' data, list-wise deletion is performed to eliminate NaN values. Simple linear regression is applied to the data gathered to see any liner relation between the outcome variable (Unemployment, total (% of total labor force) (modeled ILO estimate)) and the covariate (GDP Per Capita (Current US$)). Normalization and scaling is done to the variables to get more meaningful results. When regression model is run, below results are gathered:

With given format of Y = alpha + beta*X:

Alpha value is: 0.0733421286942184
Beta value is: -0.039223794085329916
Standard error is: 0.020155165127085779
95% Confidence interval for beta: [-0.07872791773441806, 0.00028032956375823037]

**Result:** Since 95% confidence interval does not contain 0, null hypothesis of not having any significant relation between outcome variable (Unemployment, total (% of total labor force) (modeled ILO estimate)) and the covariate (GDP per Capita (Current US$)) is rejected. There is a linear relation between these according to the linear regression model.