Group Project One

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# **Scope and purpose**

In this project, we will be exploring the science of climate change. Climate change is a complex topic and many variables can be considered when analysing available data to establish relationships and patterns. However, not all in the scientific communities share the exact same data framework to work from.

Given the size and scope of the topic we have limited the scope of this project, we will therefore analyse primarily 4 variables to substantiate the answer to our primary question: “**What is the relationship between a country’s population, GDP, C02 emissions and temperature**?” ***(****What are the effects of global temperature rises on a population***)?**

Firstly, it is essential to understand the scientific data that underlies climate change. This data should be presented objectively and without complicating individual beliefs or political affiliations. For these purposes, we will be using a dataset that contains data in relation to the variables defined below. Primarily we will utilise the following:

* Temperature (average and projected change)
* Population (actual and annual growth)
* CO2 emissions (per capita and in total)
* GDP per capita

The dataset contains data for the years 1990 - 2020 and the following questions will be addressed on an annualised basis.

# **Questions**

1. Is there a correlation between yearly global average temperature and yearly average global CO2 level ? **(Heesu)**
   1. Null hypothesis: There is no correlation between yearly global average temp and yearly average global CO2 levels
   2. Alternative hypothesis: There is a positive correlation between yearly global average temp and yearly average global CO2 levels
   3. Data:
      1. GlobalTemperature:   
         <https://www.kaggle.com/berkeleyearth/climate-change-earth-surface-temperature-data?select=GlobalTemperatures.csv>
      2. CO2 emission Dataset:  
         <https://www.co2.earth/co2-datasets>
2. If there is a correlation between an increase in global temperature and CO2 levels, then is there a relationship between a **region’s (Oceania, Asia, Africa, etc)** **average temperature and their CO2 yearly CO2 emissions?** *(optional)Can we see a local effect on a country’s temperature from their CO2 levels?* **(Anne)**
   1. Null Hypothesis: A country’s increase in CO2 level does not increase the country’s average temperature (by year)
   2. Alternative Hypothesis: A country’s increase in CO2 level does increase the country’s average temperature.
3. Is there a correlation between a **country’s wealth (GDP per Capita)** and **its yearly average CO2 emissions?** **(Oscar)**
   1. Null hypothesis: Wealth of a country does not affect CO2 emissions.
   2. Alternative hypothesis: The wealthier a country, the more CO2 they emit.
4. Is there a correlation between **global average temperature** and **global population?** (population value to be taken at the end of each year) **(Chad)**
   1. Null hypothesis: There is no correlation between global yearly average temp and global population.
   2. Alternative hypothesis: There is a positive correlation between global yearly average temp and global population.
   3. Data:
      1. Global population:  
         <https://www.worldometers.info/world-population/world-population-by-year/>
      2. Global average temperature: from heesu’s jupyter notebook

*Does this correlation (population vs temperature) exist in individual countries, or does this vary depending on location?* ***Perfectly sets us up for the next 2Q’s***

1. Is there a correlation between a country’s yearly average CO2 levels and life expectancy? Does a country’s CO2 level affect the life expectancy of a population? **(Zheng)**
   1. Null hypothesis: There is no correlation between a country’s yearly average CO2 level
   2. Alternative hypothesis: As CO2 levels increase, a population’s life expectancy decreases.
   3. Data:
      1. <https://data.worldbank.org/indicator/SP.DYN.LE00.IN>

This will enable us to visualise the effects climate change has on a population and present a succinct presentation of our analysis and findings.

# **Sources**

<https://datahelpdesk.worldbank.org/>

<https://www.worldometers.info/world-population/world-population-by-year/>

<https://www.kaggle.com/berkeleyearth/climate-change-earth-surface-temperature-data?select=GlobalTemperatures.csv>

<https://www.co2.earth/co2-datasets>