WRITEUP ASSIGNMENT 2

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MOTIVATION

Global warming is one of the biggest environmental concerns in the post-Industrial Revolution era. Global warming is the heating of the Earth's atmosphere due to an increase in the concentrations of heat-absorbing greenhouse gases. One of the primary causes of global warming is human activities like burning fossils, deforestation, etc. An increase in the human population has led to an increase in such activities, thus leading to global warming. Through this project, I want to observe how the temperature of Earth has changed over the years with population change.

GOAL

The goal of the project is to understand the change in temperature of Earth over the years and analyse one of the major causes of global warming, population growth. Through the Exploratory Data Analysis, this project enables the users to understand the relationship between climate change and world population growth. Through the EDA techniques, we will be able to answer the question: **How has the world's climate changed over the years and how does it relate to the population of the world?**

DESIGN DETAILS:

The deployed app consists of three interactive charts to enable users to understand the above-mentioned goal.

1. **Change in temperature of countries over the years**: This chart allows the user to visualise the change in temperature of various countries over the years 1961-2018. The user is allowed to use a slider to look at a particular year or run the animation to see the change over the mentioned time.
2. **Chart of World Population vs Average World Temperature**: This chart allows the user to visualise the change in temperature with the world's population over the years. The user can interact with the chart by cropping out an area to focus on a particular period and population change
3. **Country Level Change in Temperature vs Population**: The third chart allows the user to select a country dynamically and visualise the change in the average of minimum temperatures and the average of maximum temperatures of a country with the change in the population of the particular country. The user can interact with the chart by cropping out a focus area.

I looked at other methods of visualisation including bar plots, heatmaps, and time series. But to show a change in the climate along with a comparison with population change, I decided to use scatter plots and a world map consisting of a heatmap.

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DEVELOPMENT PROCESS:

The development process can be divided into four steps:

1. **Finding a relevant dataset:** I started by looking at some popular datasets that I found interesting. I ended up combining three datasets; a) Climate Change Data, b) Country Average Temperatures by month and year, c) World population by years
2. **Cleaning the dataset**: Once I finalised the dataset, I worked on cleaning it to keep only the information relevant to the goals of the project.
3. **Figuring out the visualisation techniques:** After cleaning the dataset, I worked on deciding the visualizations I wanted to include and implemented them in python.
4. **Integration of python file with streamlit**: As the last step, I integrated the python code from steps 2 and 3 with Streamlit libraries and worked on the formatting of the application.

I spent about 15-18 hours in the whole development process. The most time consuming was step 4 as this was the first time I was using Streamlit and I had to go through documentations to understand even the smallest of issues.

DATASETS:

1. Climate Change dataset by country: https://www.kaggle.com/sevgisarac/climate-change/data
2. Monthly Temperature Data of countries: http://berkeleyearth.org/data/
3. World Population Data: https://data.worldbank.org