EXPLORING WEATHER TRENDS IN LA PAZ BOLIVIA

OVERVIEW

The goal of this project is to explore and analyze the weather trends in La Paz Bolivia and the Global Temperature. For the current project, I've extracted the dataset using SQL (Environment Provided by Udacity) with the following steps:

TOOL USED:

- ➔ SQL (Udacity Environment)
- ➔ Pycharm (Python3)

STEP 1: Finding the nearest city where I live.

```
FROM city_list
WHERE country = 'Bolivia';
```

STEP 2: Changing the column names from city_data and global_data.

```
ALTER TABLE city_data
RENAME COLUMN avg_temp TO avg_temp_city;

ALTER TABLE global_data
RENAME COLUMN avg_temp TO avg_temp_global;
```

STEP 3: Using a CTE (Common Table Expression) making the filtering by county easier.

```
WITH merge AS (
      SELECT *
      FROM city_data
      LEFT JOIN global_data
            ON city_data.year = global_data.year
)
SELECT *
FROM merge
WHERE country = 'Bolivia';
```

LOADING THE DATA

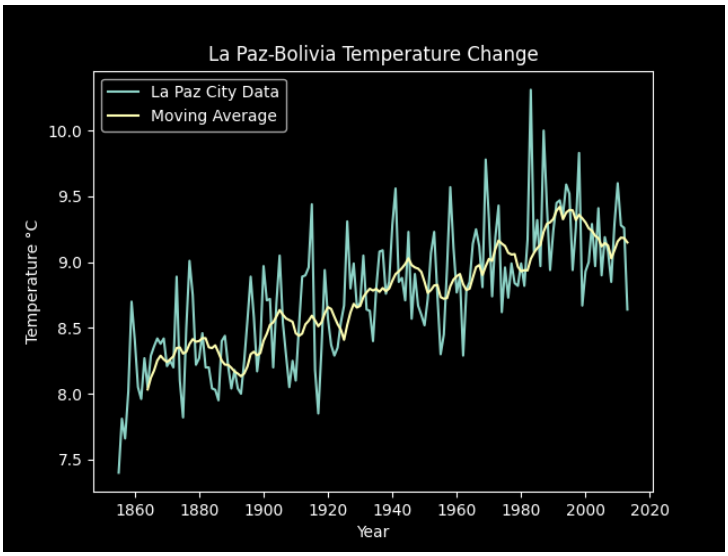
```
import pandas as pd # Data processing, CSV file
from matplotlib import pyplot as plt # For visualizing the data
# Let's explore a little bit the dataset
weather = pd.read_csv('Exploring_Weather_Trends_In_La_Paz_Bolivia.csv')
print(weather.head())
```

CALCULATING MOVING AVERAGES

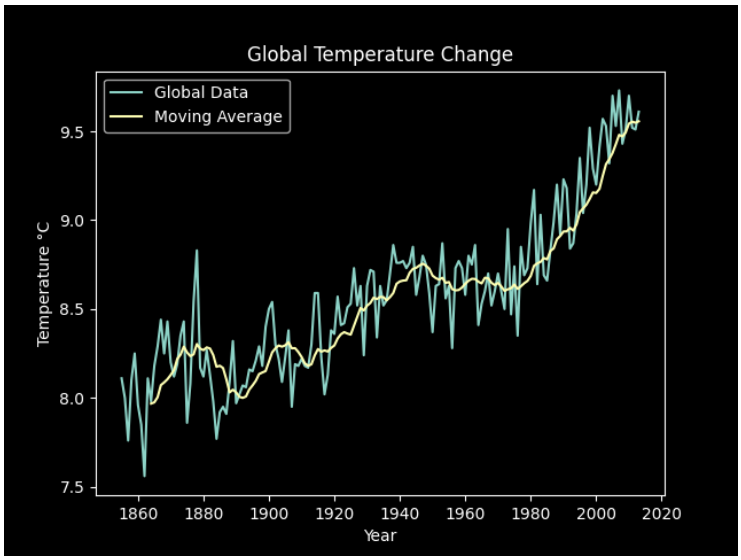
```
"""Note: Smoothing the data with moving averages is key for temperature trend
analyzing"""

# Calculating the moving average (ma_temp_city) on a 10 year basis for La Paz
city data
weather['ma_temp_city'] = weather['avg_temp_city'].rolling(window=10).mean()
# Creating the moving average (ma_temp_city) on a 10 year basis for Global
data
weather['ma_temp_global'] =
weather['avg_temp_global'].rolling(window=10).mean()
print(weather.head())
```

VISUALIZATION

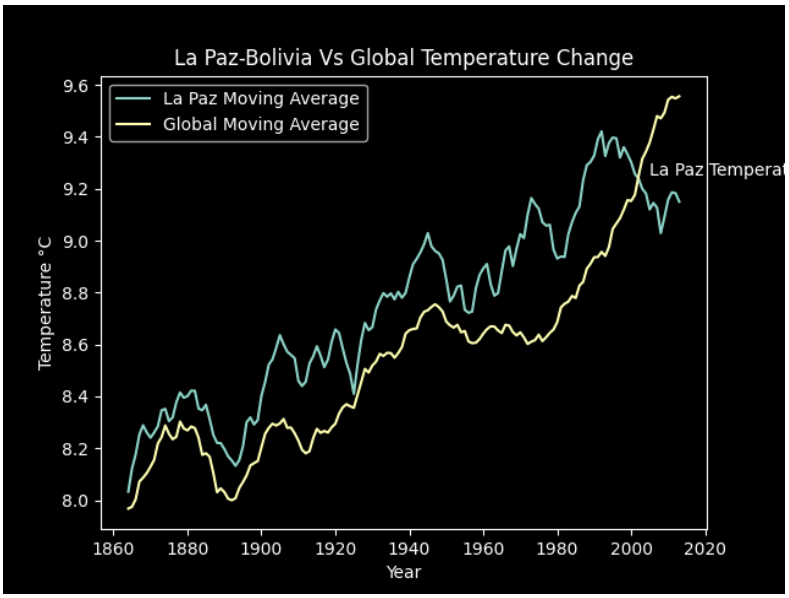
```
# Plotting La Paz-Bolivia Temperature Change
plt.style.use('dark_background')
plt.style.use('seaborn-notebook')
plt.plot(weather.year, weather.avg_temp_city, label='La Paz City Data')
plt.plot(weather.year, weather.ma_temp_city, label='Moving Average')
plt.title('La Paz-Bolivia Temperature Change')
plt.xlabel('Year')
plt.ylabel('Temperature °C')
plt.legend()
plt.show()
```




```
# Plotting Global Temperature Change
plt.plot(weather.year, weather.avg_temp_global, label='Global Data')
plt.plot(weather.year, weather.ma_temp_global, label='Moving Average')
plt.title('Global Temperature Change')
plt.xlabel('Year')
plt.ylabel('Temperature °C')
plt.legend()
plt.show()
```



```
# Plotting La Paz-Bolivia Vs Global Temperature Change
plt.plot(weather.year, weather.ma_temp_city, label='La Paz Moving Average')
plt.plot(weather.year, weather.ma_temp_global, label='Global Moving Average')
plt.title('La Paz-Bolivia Vs Global Temperature Change')
plt.xlabel('Year')
plt.ylabel('Temperature °C')
plt.text(2005, 9.25, 'La Paz Temperature Decrease')
plt.legend()
plt.show()
```



OBSERVATIONS

1. We can see that the global temperature is getting hotter and hotter.
2. The overall trend seems to be an increase in temperature that is consistent overtime.
3. We can see that the average temperature in La Paz was much hotter than the Global temperature from 1860 to 2004 approximately.
4. Notice that since 2005, La Paz city has decreased in the temperature average. La Paz is very known for its changing weather.

REFERENCES

https://www.dallasfed.org/research/basics/moving.aspx