Exploring Weather Trends - Project guide

May-21, 2020

Udacity Project In Data Analyst Nanodegree

Most people can understand the visualization, as 40% of the people can answer basic questions about the information provided on the record visualization. Therefore, when providing information in the form of linear charts, people show a good understanding of the plots and provide accurate forecasts in this project. In this project, we will extract data from the global temperature database and compare it with the closest big city to where I live in order to draw a blueprint that can be understood and answer different questions:

Is your city hotter or cooler on average compared to the global average? Has the difference been consistent over time?

“How do the changes in your city’s temperatures over time compare to the changes in the global average?”

What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?

Content :

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Temperature Trend Analysis over the Last 30 Years in Riyadh

Country, Saudi Arabia

Abstract: Long-term temperature changes are a major determinant of climate change, and this has an effect on rainfall, relative humidity, wind speed, etc.

With reference to the station to study climate data for the meteorological station in Riyadh by database, we find that the average temperatures have an increased general trend

Keyword: temperature; precipitation; Saudi Arabia; mann kendall; climate variability

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1. Introduction

Riyadh is one of the cities most vulnerable to climate change because of hight warming, which will have bad consequences for humans and nature, as drought, floods and heat stress are expected to increase.

Riyadh has experienced an increase in temperature since the beginning of the eighties and consequently changes in rainfall and prolonged droughts that affected agricultural production and livestock and thus lead to an increase in food insecurity in the future and all these are Negative indicators in global. This is due to the environmental impacts of factories, car exhausts, wars, etc., while a glimmer of hope appeared in maintaining climate balance and stopping the widening of the ozone hole at the moment of the emergence of Corona disease by stopping the causes of this environmental pollution.

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2. . Description Study Area

Riyadh is the capital of Saudi Arabia and the largest city on the Arabian Peninsula. Riyadh is located on the eastern part of the Najd plateau at about 600 metres (2,000 ft) above sea level

Riyadh region

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3. Data analysis method And Tools

The monthly and yearly mean temperature was calculated by the database and mean analysis to detect any possible trends in the data during the study period.

And from our role, we inquired about the temperature of the city of Riyadh, using SQL through database, and then explain results by drawing the plots in the Python and using the Excel program To confirm the results and To multiply the ways of analyzing data by various the tools.

To write pretty code in this document, I have used VSCode and PyCharm color formatting.

note

In this study ,I have listed links or resources in the references giving a value like ([*]) in order to make reference index.

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4. Code

4.1 Extraction of Data from provided Database

To Query cities are available for " Saudi Arabia" in the Database:

```
SELECT *
FROM city_list
WHERE country = 'Saudi Arabia'
```

To join the two tables to extract Global Average Temp and City Average Temp in each years:

```
SELECT global_data.year, global_data.avg_temp AS "GlobalAT",
city_data.avg_temp AS "CityAT"
FROM global_data
JOIN city_data
ON global_data.year = city_data.year
WHERE city LIKE 'Riyadh'
```

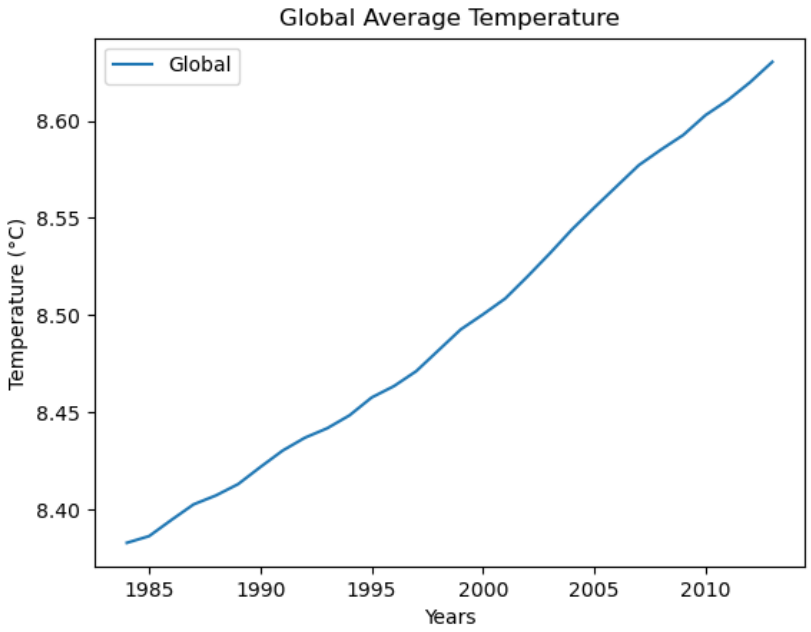
Compare the temperature in Riyadh and Global , download the file as CSV format. as "results.csv".

4.2 Python Code for Drawing Line Chart

Import python libraries here , like pandas read file 'results.csv' and convert data to DataFrame. Matplotlib for Line plot,it is a plotting library for the Python programming language to plot a lot charts for data analysis [1]

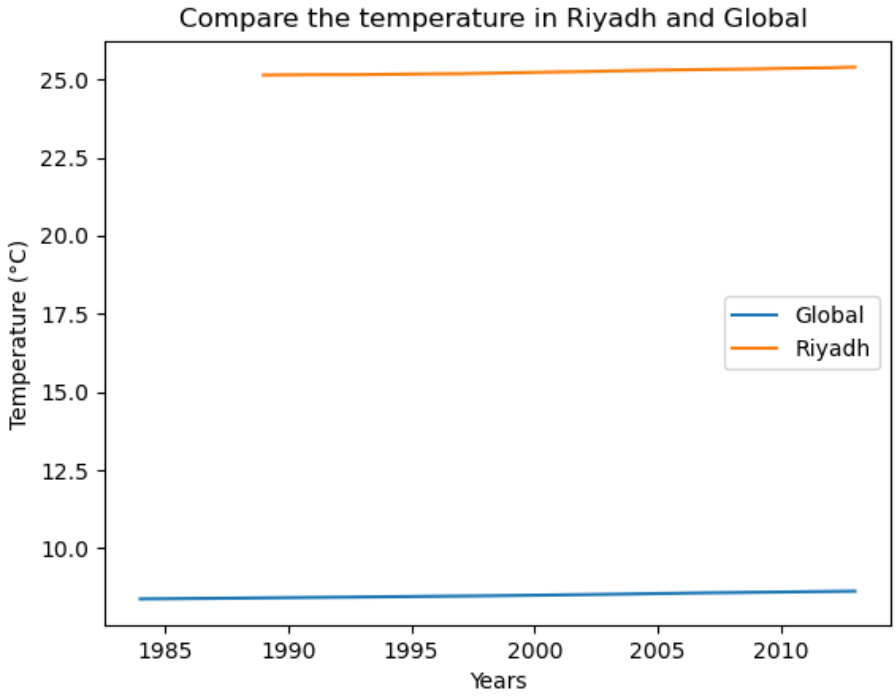
```
# import Libraries
import numpy as np
import pandas as pd # For processing large amounts of data
from matplotlib import pyplot as plt   # plot library I use line
chart as the simple

# read DataSet in python
data = pd.read_csv("results.csv")

#Drawing the plot Global Temperature
plt.plot(data['year'], data['GlobalAT'].rolling(142).mean(), label =
'Global')
plt.legend()
plt.xlabel("Years")
plt.ylabel("Temperature (°C)")
plt.title("Global Average Temperature")
plt.show()
```

rolling() fuction calculate moving averages in order to draw smooth graph. [2]

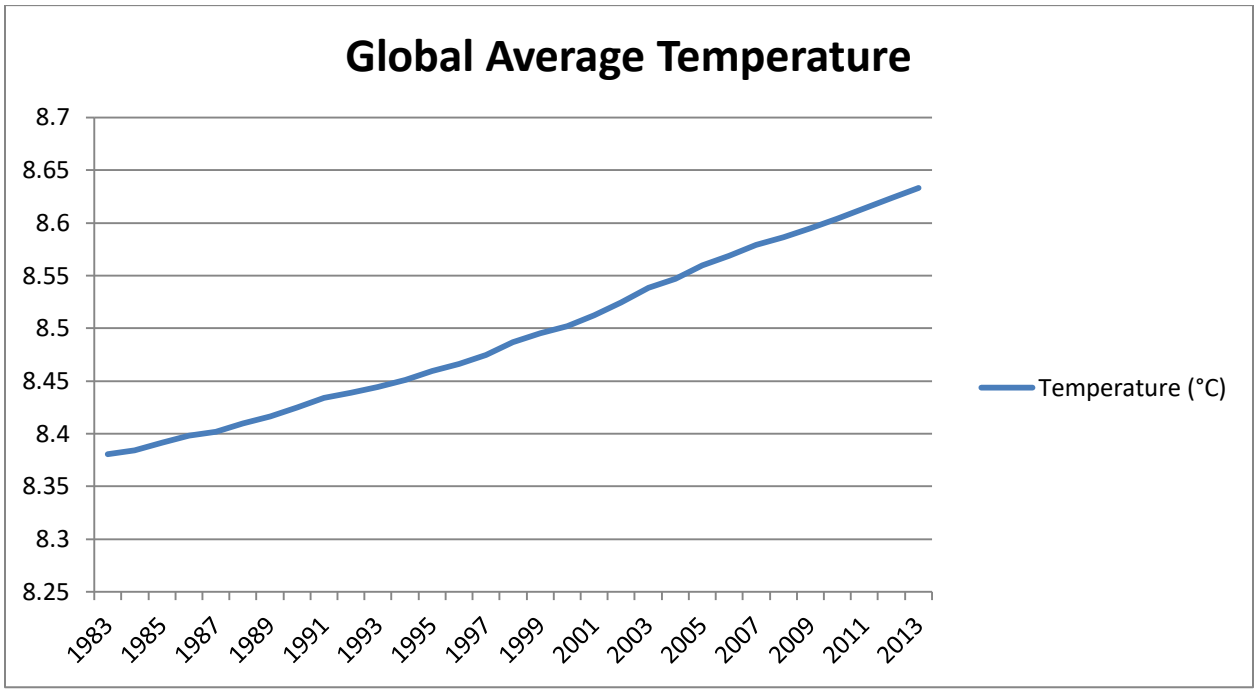


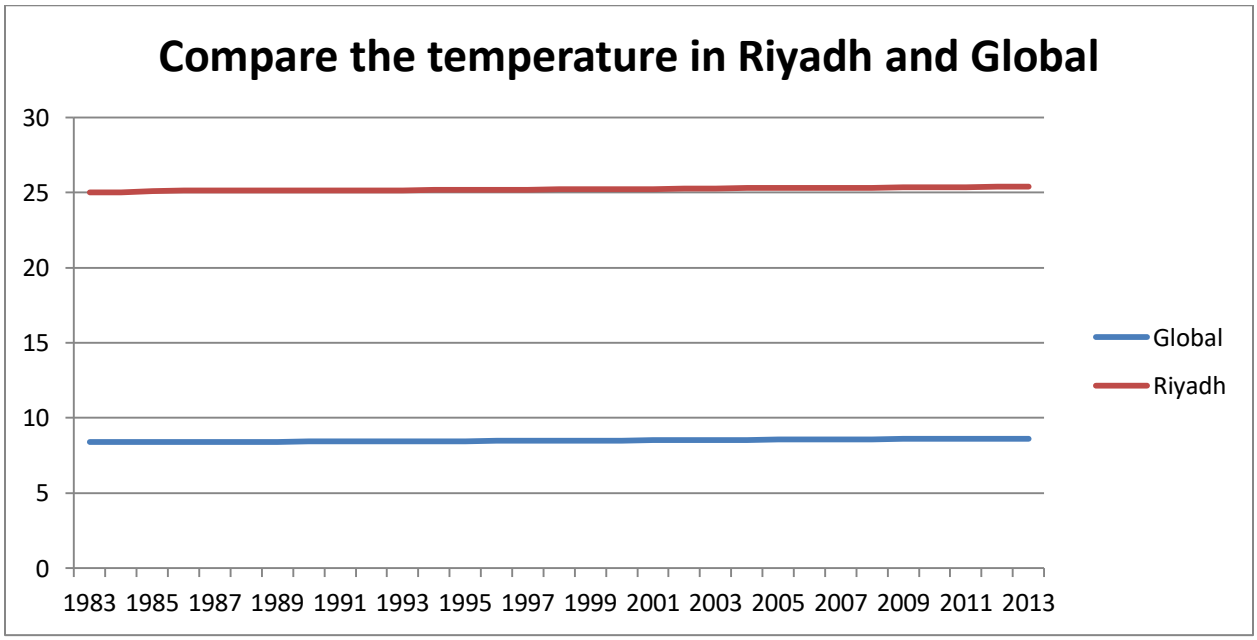
Drawing the line plot for Riyadh Temperature

```
plt.plot(data['year'], data['CityAT'].rolling(142).mean(), label = 'Riyadh')
```



In Exacle:


Global Average Temperature
8.7
8.65
8.6
8.55
8.5
8.45
8.4
8.35
8.3
8.25
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Temperature (°C)


Compare the temperature in Riyadh and Global
30
25
20
15
10
5
0
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013
Global
Riyadh

5. Conclusion

The maximum temperature is in June

The lowest temperature in January

The average heat in Riyadh is 25 degrees, which exceeds the average global temperature, so the rate of rainfall will be minimal in Riyadh, not exceeding 150 mm / year.

Increased drought in the region

Air temperature has a major effect on the water cycle in the study area

Riyadh is vulnerable to climate change, where climate change occurs every ten years, and in the last years there is a positive indication of an increase in the rate of rainfall compared to previous years.

Therefore, concerned parties should take into consideration consideration of temperature fluctuations in the region in order to develop an adaptation strategy

Halting the expansion of the ozone hole to maintain the non-increase in the temperature of the earth by setting an international policy that compels all countries to balance the environment, given that the land belongs to all.

REFERENCES:

The image of Riyadh City : https://www.almrsal.com/wp-content/uploads/2014/12/riyadh.jpg

1. Intro to Data Analysis / Visualization with Python, Matplotlib and Pandas | Matplotlib Tutorial

https://www.youtube.com/watch?v=a9UrKTVEeZA

2. Calculation for Moving Average in Python:

http://www.learndatasci.com/python-finance-part-3-moving-average-trading-strategy/

https://pandas.pydata.org/pandas-docs/stable/generated/pandas.DataFrame.rolling.html