Weather Trends Analysis

2020

MARCH 27, 2020

Data Analyst Nanodegree
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Aim: The aim of the Weather Trends Analysis is to compare the temperature trends of my city (Port Harcourt - the city nearest to me from the dataset) and the global temperature trends. The analysis also gives a little glimpse into my favourite city, which is New Delhi, India.
These are to be visualized using line graphs.

Data Extraction From The Database:
Extraction of List of Cities: In order to extract list of cities, the SQL command below was executed:

```
SELECT *
FROM city_list;
```

Extraction of Temperatures for Different Cities: In order to extract temperatures for different cities, the SQL command below was executed:

```
SELECT *
FROM city_data;
```

Extraction of Global Temperatures: In order to extract global temperatures, the SQL command below was executed:

```
SELECT *
FROM global_data;
```

After running each code above, the 'Download CSV' button was clicked to download the dataset to my computer in csv format.

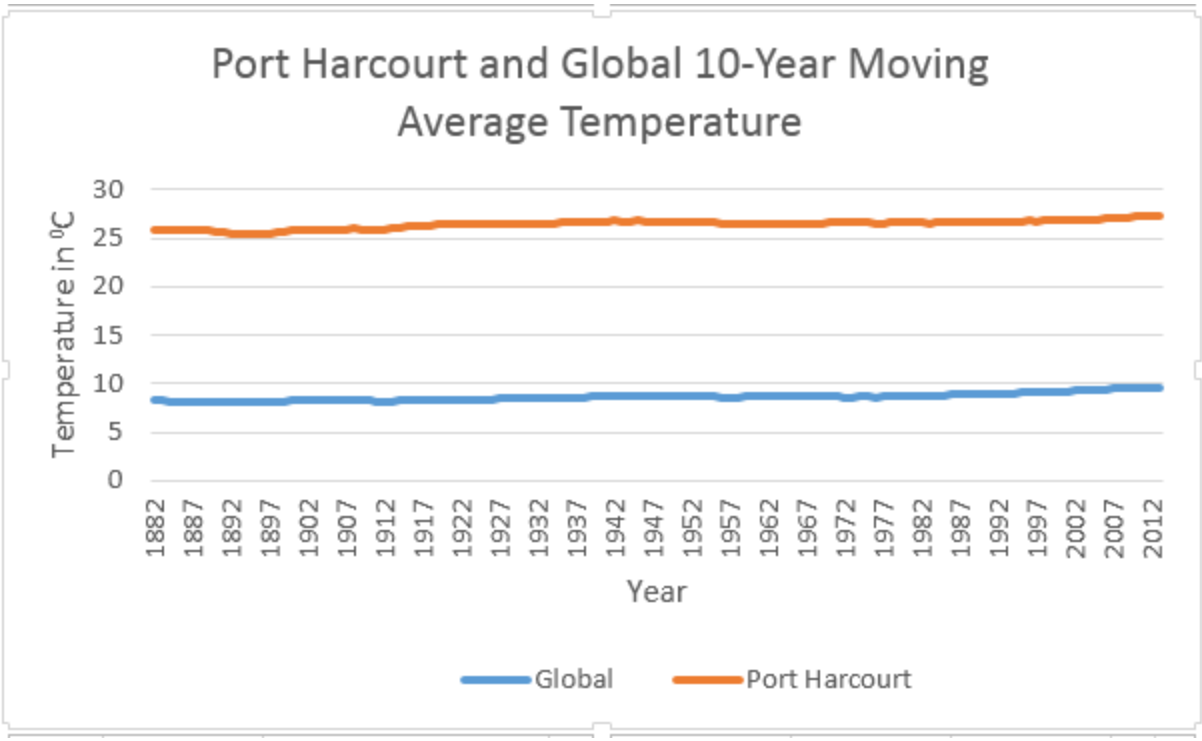
Open CSV Files:
The downloaded csv files were opened using Microsoft Excel 2013. The csv files were saved with .xlsx file extension in order prevent the loss of items such as line graphs and other sheets created in the file.

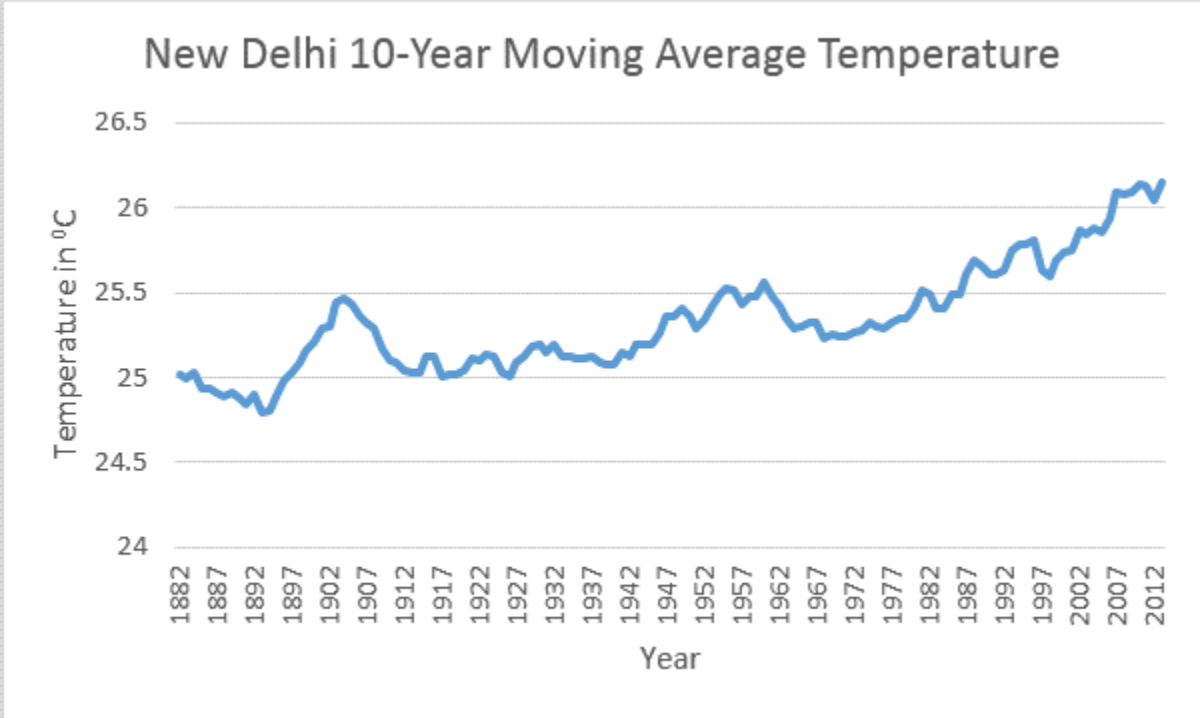
Line Charts For Temperatures Trends Visualization:

Line charts for temperatures trends were created for Port Harcourt, Nigeria, the Globe (The world temperatures) and New Delhi, India, my favourite city. A 10-year moving averages were utilized which smooth out lines and make trends more observable.

Limitations:

Due to missing data between 1863 and 1872 for Port Harcourt, Nigeria, the analysis was carried out for years between 1873 and 2013. This was applicable to the Globe and New Delhi temperatures.





Correlation Coefficients:

The correlation coefficients for Port Harcourt, Globe and New Delhi were calculated. These show the correlation between the years and the temperatures.

The correlation coefficient was calculated using the formula below in Excel:

Correlation coefficient = CORREL(array1, array2)[1]

Where array1 is the range of years and array2 is the range of temperatures.

Correlation coefficient for Port Harcourt = CORREL(B2:B142, E2:E142)[2]

Correlation coefficient for Globe = CORREL(A3:A143, B3:B143)[3]

Correlation coefficient for New Delhi = CORREL(A2:A142, D2:D142)[4]

The correlation coefficient for Port Harcourt, Globe and New Delhi are 0.8, 0.9 and 0.6 respectively.

Observations:

The following were observed from the line graphs and calculated correlation coefficients:

- The temperature of city becomes hotter compared to the global temperatures
- There a strong correlation between temperatures and years. This shows that as the year increases the temperature also increases.
- The temperature trends for my city, the globe and my favourite city are identical and consistent.
- The temperature trends for Port Harcourt and the globe have a sharp increase towards the ends of the graphs.

Conclusion:

In conclusion, except something drastic is done about the world temperatures, it will continue to increase steadily over the years.

References:

1: https://www.extendoffice.com/documents/excel/4152-excel-calculate-correlation-between-two-variables.html
2: https://drive.google.com/open?id=1s_etRJ0dH32XBYGa0znpztQ6ukn_dRgo
3: https://drive.google.com/open?id=14_MtYeAJF3EcwjY6vSZkLgOKcQHsLnfK
4: https://drive.google.com/open?id=1BX5Q3SgmOUcx6TeFPXwl4FkDHG58Iaz-