2018

Project 1:
Explore Weather Trends

UDACITY: DATA ANALYST NANODEGREE PROGRAM

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1. Summary

This project is to analyse and compare the temperature trends in local city - Singapore to overall global temperature trends.

2. Data Extraction

The tool used for data extraction is SQL.

2.1. Find nearest city – Singapore

```
SELECT *
FROM city_list
WHERE city LIKE 'Singapore'
```

2.2. Extract both Singapore and global data

Extract both Singapore and global data by joining the 2 tables and create new columns for the respective average temperature.

```
SELECT global_data.year, city_data.city, city_data.avg_temp AS Singapore,
global_data.avg_temp AS Global
FROM city_data JOIN global_data
ON city_data.year = global_data.year
WHERE city_data.city LIKE 'Singapore'
```

2.3. Remove missing data from Singapore average temperature

There were missing average temperature data for Singapore from year 1825 to 1838 thus they were removed for this analysis.

```
SELECT global_data.year, city_data.city, city_data.avg_temp AS Singapore,
global_data.avg_temp AS Global
FROM city_data JOIN global_data
ON city_data.year = global_data.year
WHERE city_data.city LIKE 'Singapore' AND global_data.year > 1838
```

2.4. Export to CSV

Singapore and global data extracted and exported to CSV.

3. Data Manipulation

The tool used for data manipulation is Microsoft Excel. Moving average was calculated for 3, 5 and 10 years. 3, 5 and 10 years was chosen as lower values produce a less smooth line where pattern can be observed.

3.1. Calculate 3-Year Moving Average

3-Year Moving average were calculated using the excel formula shown below, where column B contains Singapore average temperature and column G contains global average temperature. The same formula was used all the way down to the end of the data.

= Average (B2:B4)
= Average (G2:G4)

3.2. Calculate 5-Year Moving Average

5-Year Moving average were calculated using the excel formula shown below, where column B contains Singapore average temperature and column G contains global average temperature. The same formula was used all the way down to the end of the data.

= Average (B2:B6)
= Average (G2:G6)

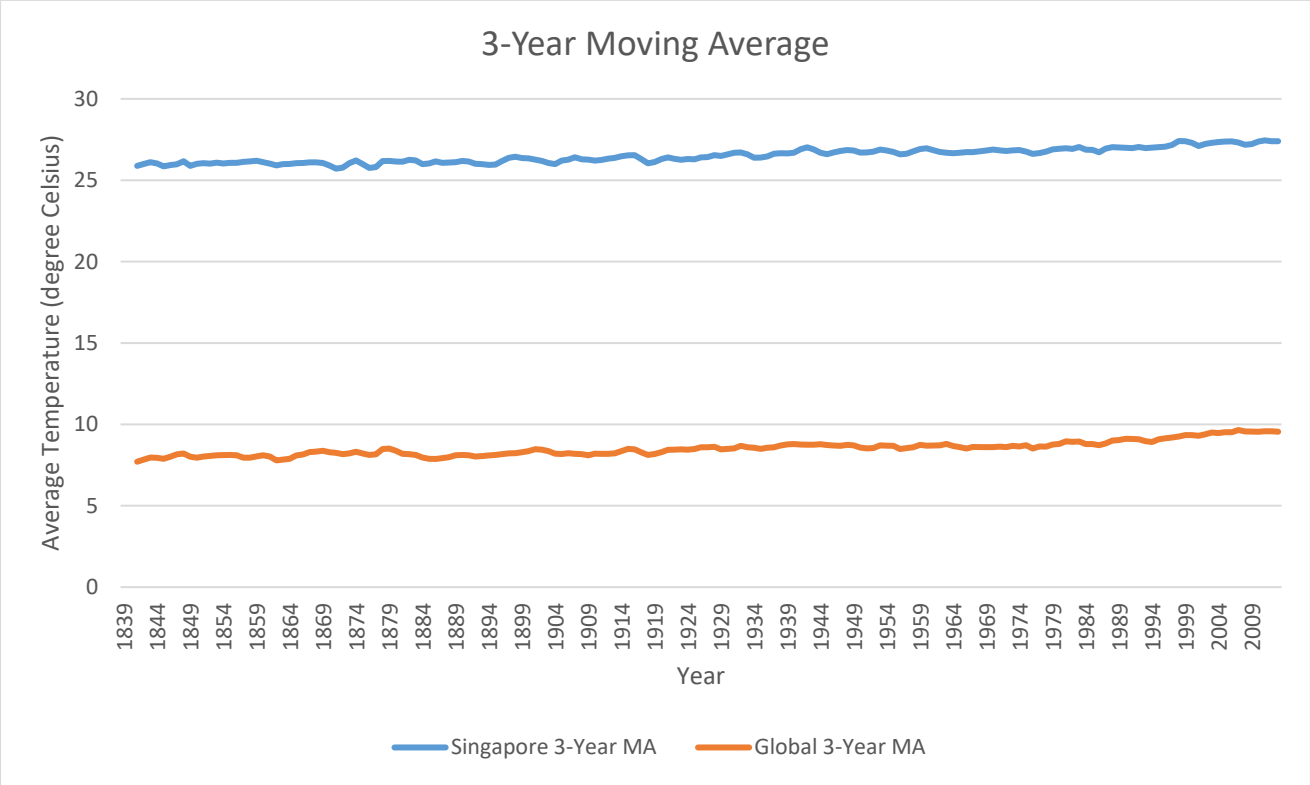
3.3. Calculate 10-Year Moving Average

10-Year Moving average were calculated using the excel formula shown below, where column B contains Singapore average temperature and column G contains global average temperature. The same formula was used all the way down to the end of the data.

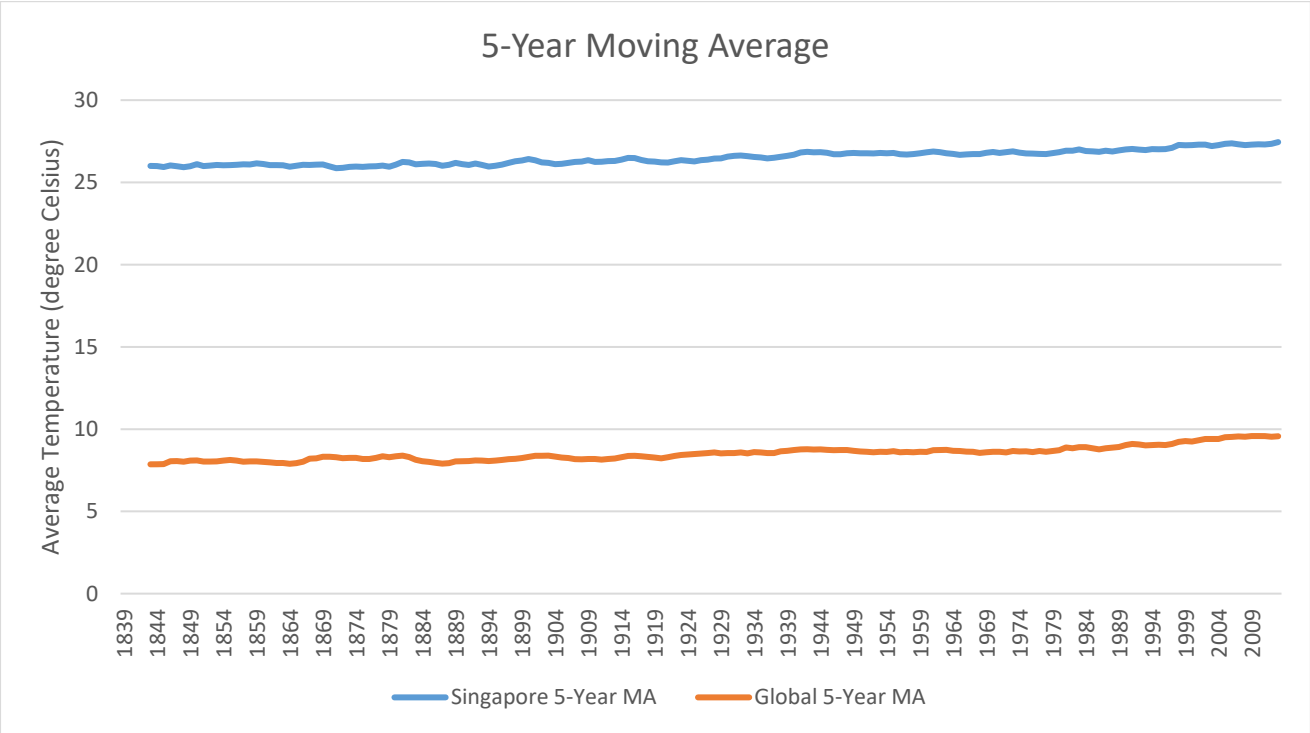
= Average (B2:B11)
= Average (G2:G11)

5. Data Visualisation

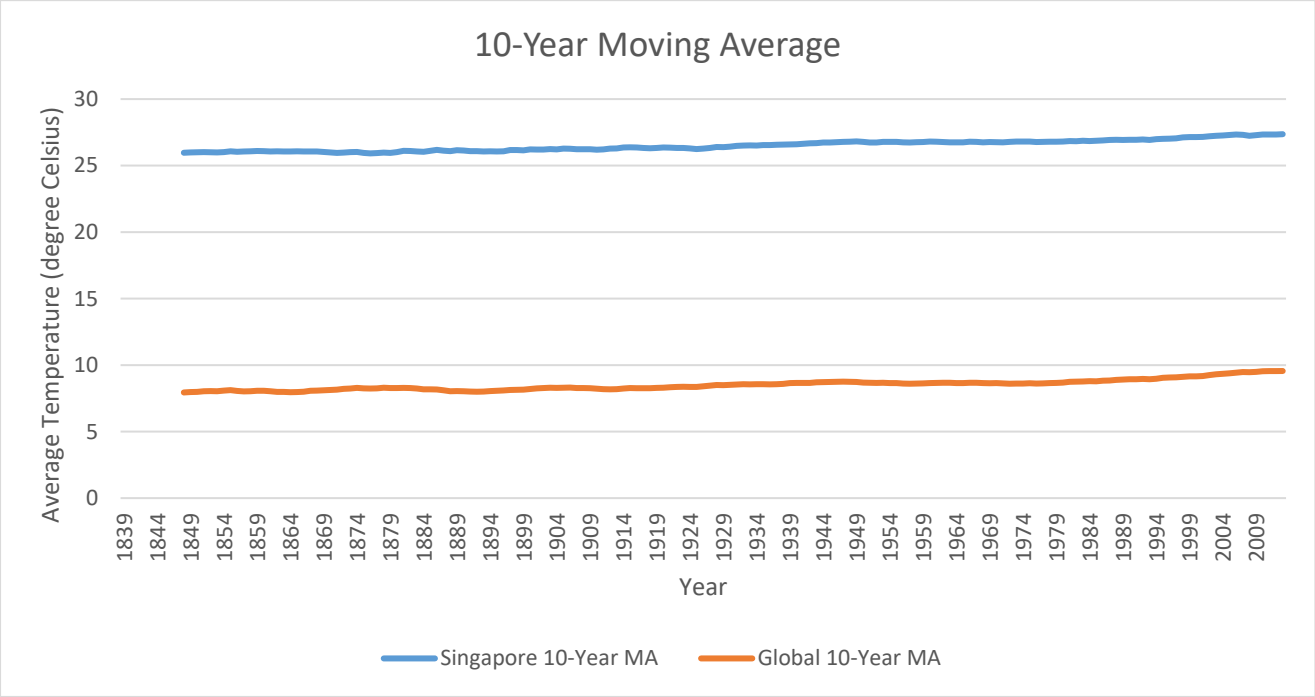
5.1. 3-Year Moving Average



5.2. 5-Year Moving Average



5.3. 10-Year Moving Average



6. Observation

6.1. Similarities

- Singapore and global average temperature are both observed to be consistently increasing in the same upwards pattern.
- Overall trend of both Singapore and global are consistent increasing over the last few hundred years which means that the world is getting hotter.

6.2. Differences

- Singapore average temperature is observed to be hotter on average compared to the global average.
- Singapore average temperature is between 26 to 27 degree Celsius where global average temperature is between 8 to 10 degree Celsius. Singapore is approximately 3 times hotter than global average.
- The changes in Singapore's average temperature over time fluctuate more than the changes in global average temperature. By looking at the 3-Year Moving Average Line Chart, there are times where there is a drop or increase in temperature.