



Data Analysis

Misk Academy - Udacity

Exploring Weather Trends

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Introduction

This report is exploring weather trends throughout 200 years period globally and compare it to Mecca city weather in Saudi Arabia. It will illustrate data through line graphs after applying moving averages and extracting data using SQL query statements.

Data extraction

In order to extract data stored in temperatures database, the following SQL statements are used:

For checking the available city list and selecting Mecca the closest city to Madinah my home place.

- **select city country from city_list**

for extracting data for a specific city using where clause.

- **select * from city_data where city='Mecca'**

for extracting all global data.

- **select * from global_data**



After checking the desired results the data was exported as csv files then the data was cleaned in a way where blank data was removed.

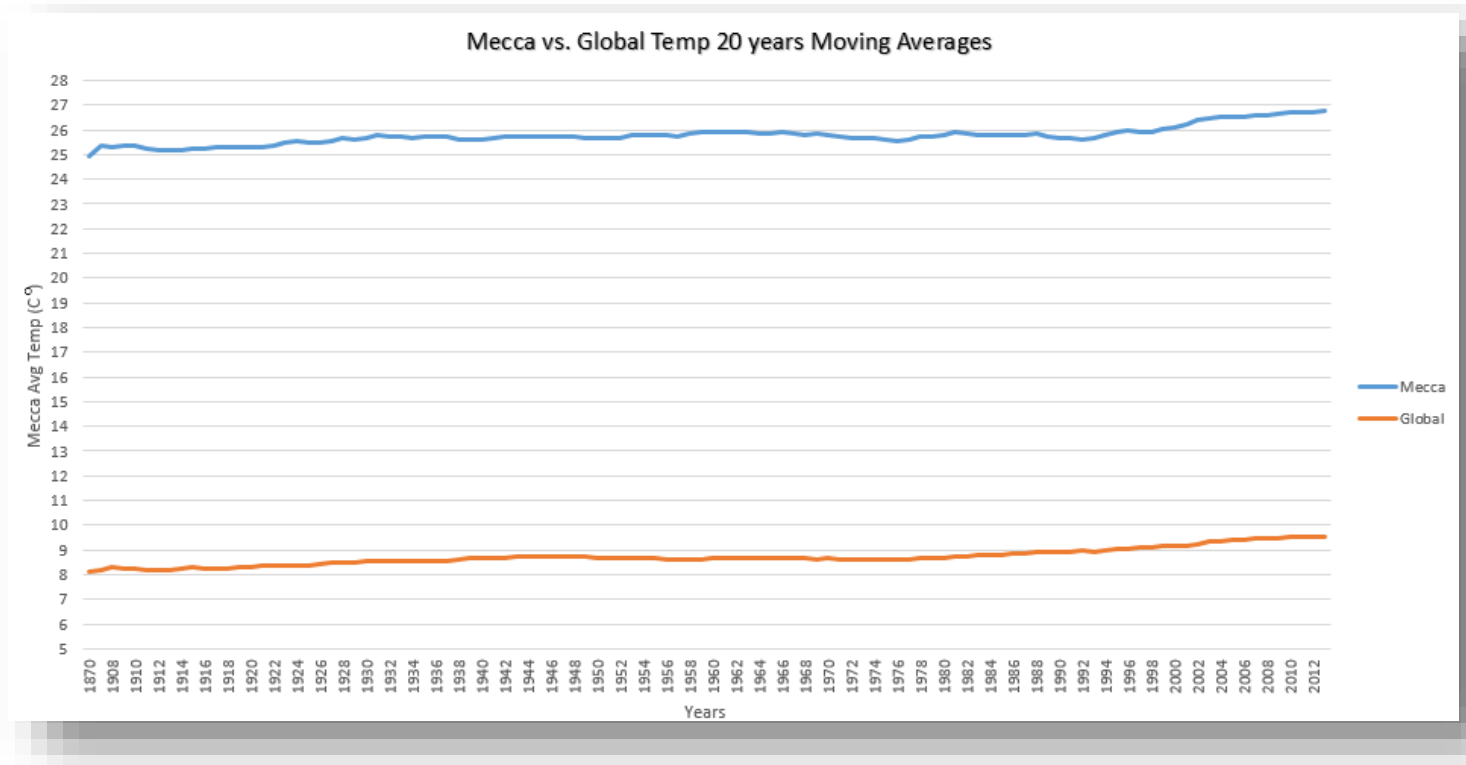
Moving average

At this point the actual data was not used to create the line graphs, instead moving averages were calculated and used in order to create clear and smooth line trends for better observation and comparisons.

Moving average period length used is 20, the reason for selecting 20 as a period length is that we need to smooth out the curve but at the same time we'd like to keep the value of the long history data (over 100 years) and after several attempts it is found that 20 is the ideal period for this data set as it is considered medium-term and the most accurate moving average in our case.

Excel provides several Add-Ins including Data Analysis tools where data can be selected and by entering the desired period length, moving averages results are calculated.

Temperature Trends Observations



The above graph illustrates Mecca city versus global temperatures trends. In general, both Global and local temperatures are rising throughout the years with noticeable steady increase over the 100 years period.

By taking a close look, four different comparisons are noted.

- At the period of 1960 to 1966 the global temperature did not change noticeably as it stayed between the ranges of 8.64°C to 8.67°C. Similarly, Mecca retained a minor temperature change between the years of 1942 to 1948 where the temperature stayed in the range of 25.70°C to 25.73°C, so only 0.3 degrees differences for both Mecca and global.
- In 1997 Mecca temperature started to reach new temperature degrees as 25.9°C till 26.8 °C in 2013.
- The lowest degree registered for Mecca temperature is 24.9°C in 1870 where globally was 8°C in the year of 1892.
- The highest degree registered for global temperature is 9.5°C in 2013, where Mecca reached 26.8°C at the same year.