Explore Weather Trends

August 14, 2018

1 Project 1: Explore Weather Trends

1.1 Data Extraction using SQL

city_data:

```
SELECT *
FROM city_list
WHERE country like 'United States'
```

```
SELECT *
FROM city_data
WHERE country = 'United States' AND city = 'San Jose'
```

global_data:

```
SELECT *
FROM global_data
WHERE year >=1849 AND year <= 2013
```

1.2 Data Manipulation using Python

Use pandas library to read the csv files and computer moving average.

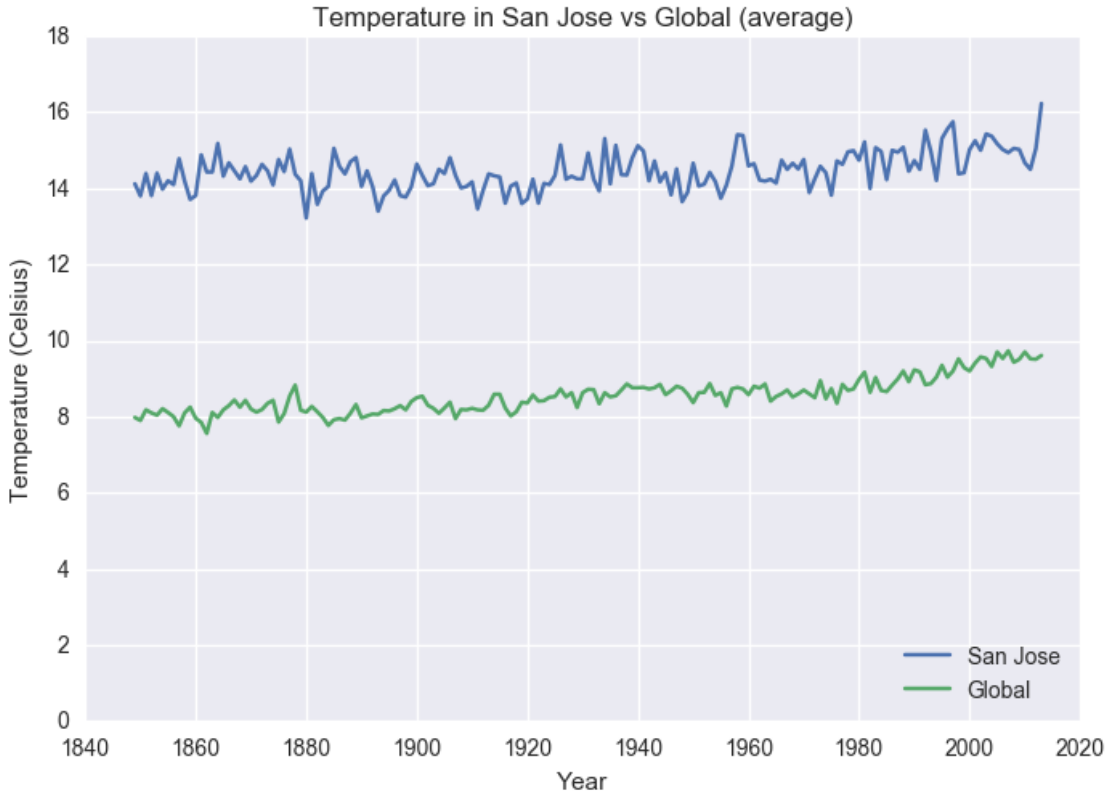
```
In [1]: %matplotlib inline
        import pandas as pd
        import numpy as np
        import matplotlib.pyplot as plt
        import seaborn as sns

        city_data = pd.read_csv('city_data.csv')
        global_data = pd.read_csv('global_data.csv')
        city_data_mv = city_data.rolling(window = 10, on = 'year').mean()
        global_data_mv = global_data.rolling(window = 10, on = 'year').mean()
```

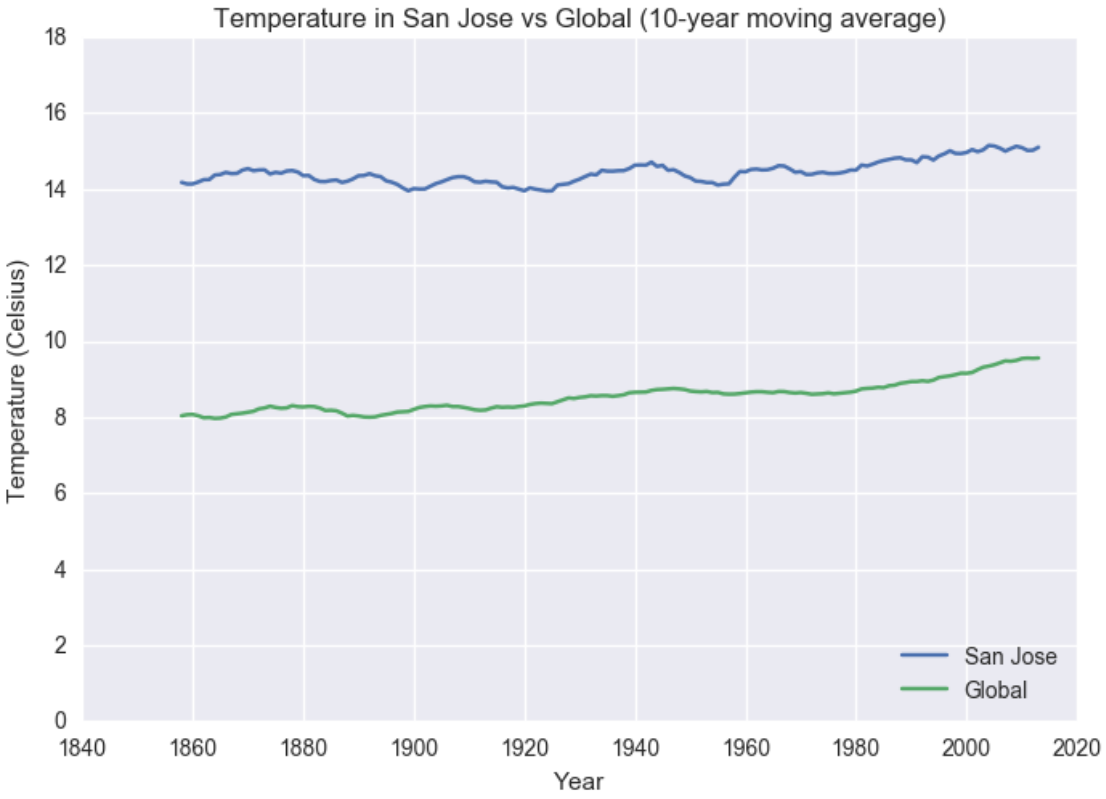
1.3 Data Visualization

Key consideration: line chart is the correct plot to visualize the temperature trends.

```
In [2]: plt.plot(city_data['year'],city_data['avg_temp'], label = 'San Jose')
        plt.plot(global_data['year'],global_data['avg_temp'], label = 'Global')
        plt.xlabel('Year')
        plt.ylabel('Temperature (Celsius)')
        plt.legend(loc=4)
        plt.ylim([0,18])
        plt.title('Temperature in San Jose vs Global (average)');
```




```
In [3]: plt.plot(city_data_mv['year'],city_data_mv['avg_temp'], label = 'San Jose')
        plt.plot(global_data_mv['year'],global_data_mv['avg_temp'], label = 'Global')
        plt.xlabel('Year')
        plt.ylabel('Temperature (Celsius)')
        plt.legend(loc=4)
        plt.ylim([0,18])
        plt.title('Temperature in San Jose vs Global (10-year moving average)');
```



1.4 Data Interpretation

1. From the moving average chart: the global average temperature is higher than San Jose average temperature. The difference is about 6 Celsius
2. From the moving average chart: overall both the global temperature and San Jose temperature are rising during the past 150 years
3. From the moving average chart: the slope of the line tells us that the temperature changing rate is not constant
4. From the moving average chart: San Jose temperature is not steadily increasing as the global temperature. San Jose temperature line has more obvious peaks and valleys
5. From the average chart: San Jose temperature is soaring during the recent 5 years!