- SQL Queries Used to Extract Data

```
select * from global_data;
select * from city_list;
select * from city_data;
select * from global_data order by year;
select  * from city_list where country='United States'
and city like 'S%';
select  * from city_data where  city = 'San Jose'
order by year;
select  year, avg_temp from city_data where  city = 'San Jose'
order by year;
select  year, avg_temp from city_data where  city = 'Hyderabad' and country='India'
order by year;
```

- Google Spreadsheet was used to calculate moving averages and to plot linear chart for global temperatures, San Jose and Hyderabad cities average temperatures. Initially, moving averages were calculated for 5 , 20 and 35 years. Although linear chart of global temperature moving average was smooth, San Jose city linear chart still showed spikes . In order to reduce spikes moving average for 50 years was considered and plotted across. Hyderabad city (India) temperatures were also chosen to compare temperature changes across the continents.

- The key consideration was to use same time period of years across global temperatures and city temperatures. The time period of 1849 to 2013 was chosen to calculate moving average and to plot linear chart. The data was available for all these years. Also, 100 data points were available to plot linear chart.
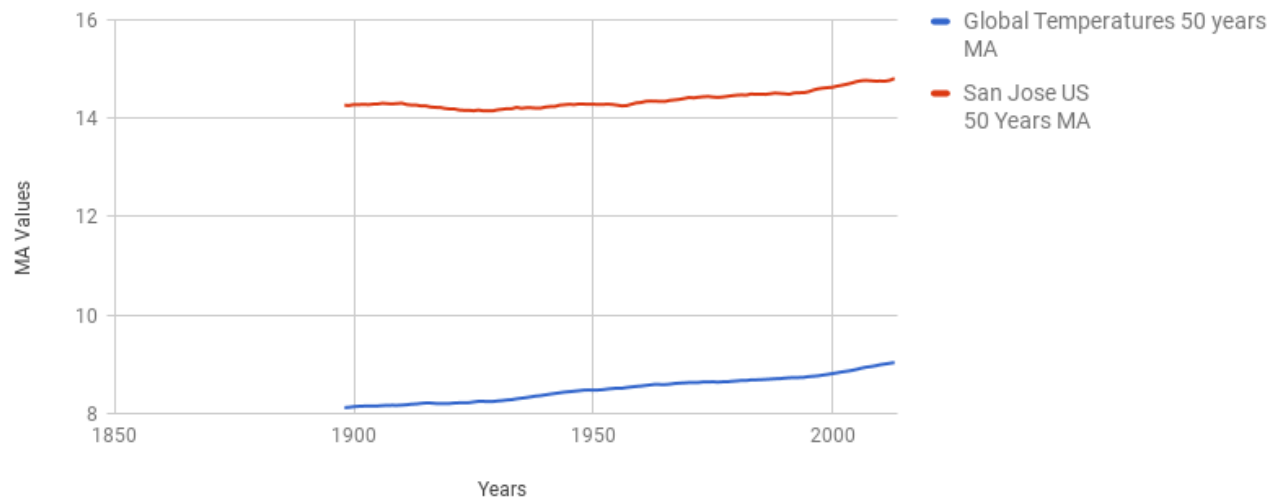

San Jose US Average Temperatures and MA
50 Years MA
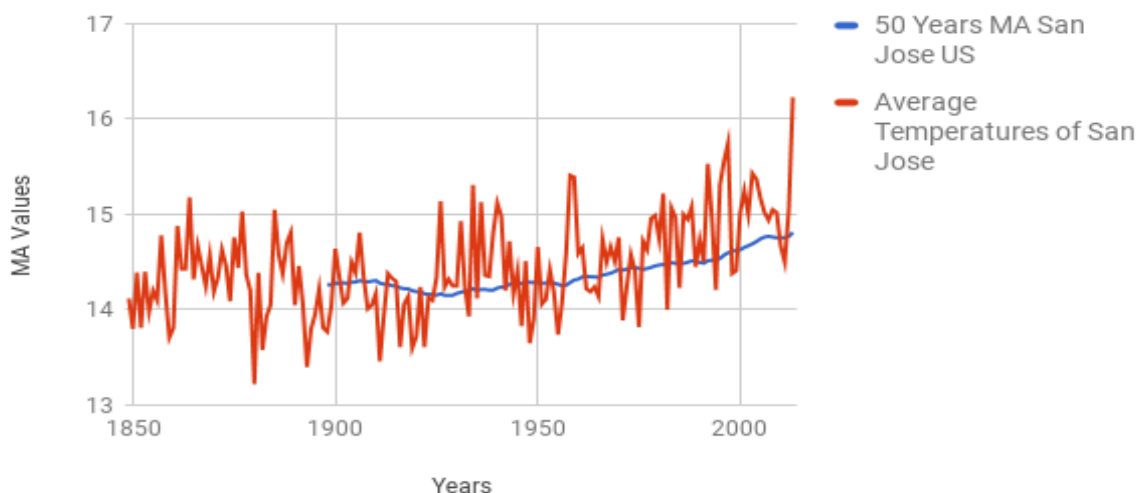
Global Average Temperatures and MA
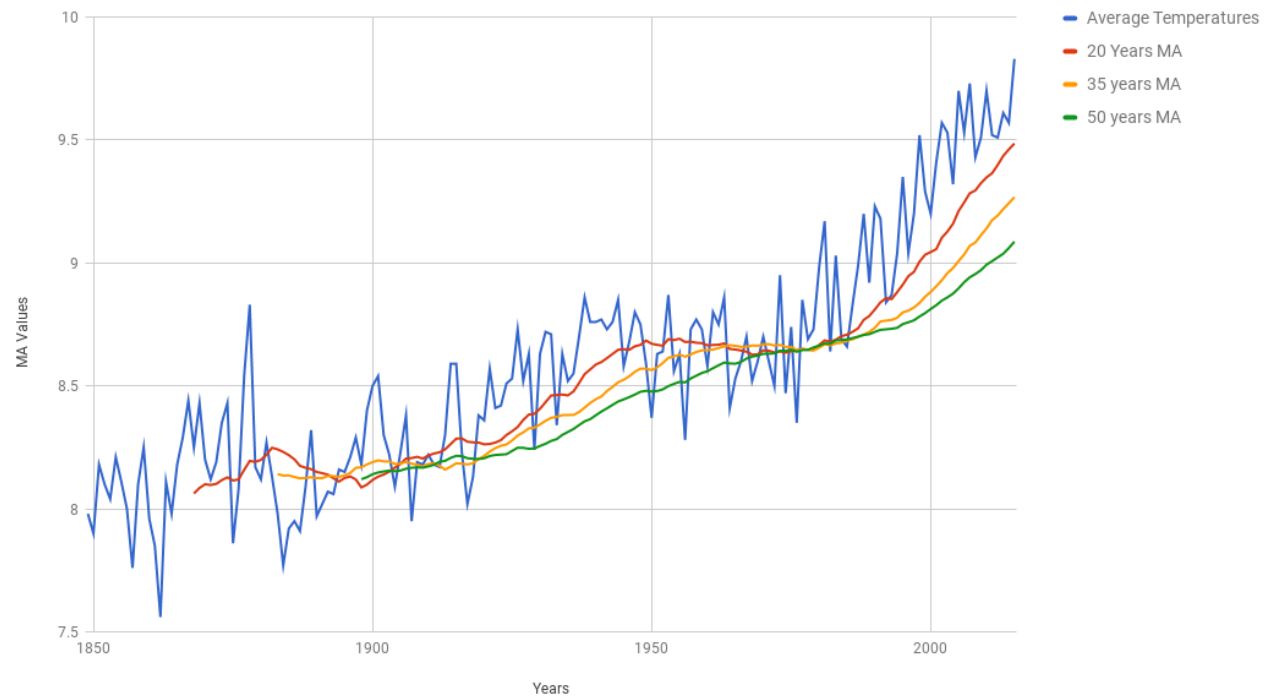
Global Temperatures and San Jose 50 Years Moving Average

Observations
- San Jose City has been hotter than Average Global Temperature. The city is consistently holding temperature that is 6 C above average global temperature.
- San Jose city and global average temperature has been raising without any spikes or dips. San Jose city temperatures was steady during time period of 1898 to 1950 and has risen 0.2 C in time frame of 1829 to 2013. But global temperature was raising consistently due to combine effect of all other cities. It can be inferred here that San Jose city had a small role in raising temperatures during time period of 1898 to 1950 .
- The moving average of San Jose has cut through average temperatures to indicate steady trend in comparison to global temperatures 50 year moving average lying below global average temperatures indicating raising temperature.
- Moving average and line Chart is plotted for Hyderabad city. This city is consistently 18 C and 12 C higher than average global temperature and San Jose. Also, moving average of Hyderabad is almost steady but slightly inclined upwards after year 2000 indicating slow raising temperatures.
- Correlation coefficient is calculated between years and average temperature (r = 0.467 San Jose / r = 0.669 Hyderabad / r= 0.863 Global Temperature). The high value of correlation coefficient for global temperatures shows raising temperature trend and low value of or San Jose shows steady temperatures with coming years.
- Moving average of short-term 20 years is above 35 and 50 shows consistent raising of temperatures at a faster pace. It is evident in moving average line chart and coefficient correlation that in last 100 years global temperatures have been raising making the world a bit hotter.

50 Years MA San Jose, US and Hyderabad, India