- What tools did you use for each step? (Python, SQL, Excel, etc)

  I used SQL to fetch the data from the database , the data being fetched consist Of the Global Average Temperature Data as well as the Average Temperature of The Agra which is also my nearest city.. The moving average and visualization Was both done in R language with a little help from ggplot library

  The SQL Queries are

  ```
  SELECT year,avg_temp

  FROM city_data

  WHERE city='Agra'


  SELECT *

  FROM global_data


  SELECT city,country

  FROM city_list

  WHERE country='India'
  ```

- How did you calculate the moving average?

  I checked the Data first of any null values in both csv files , the temperature of Agra consist of the missing temp values with the last missing value from the year 1864. Therefore i filtered both the dataset for year greater than 1864. After that Using a for loop in R i was successfully was able to calculate the 10 year moving Moving average for both the local and global temperature. Inside the For loop i combined the value corresponding to the current index to 10 index before the current index. After combining i took the sum of it all and divided it by 10. I did that for all the rows in dataframe thereafter

```
[89]: Local1 <- Local[Local$year>1864,]

[90]: Global1 <- Global[Global$year>1864,]

[91]: for (x in 10:nrow(Local1)){
          Local1[x,"MOVE"] <- sum(Local1$avg_temp[x:x-10])/10
      }

[93]: for (x in 10:nrow(Global1)){
          Global1[x,"MOVE"] <- sum(Global1$avg_temp[x:x-10])/10
      }

[95]: Global2 <-  Global1[-c(1:10),]
      Local2  <-  Local1[-c(1:10),]   #Filtering the null values

[101]: tail(Local2,5)   #Local Temperature dataset MOVE here Average Temperature
       tail(Global2,5)  #Global Temperature dataset MOVE here Average Temperature
```

	year	avg_temp	MOVE
214	2009	26.55	2.612
215	2010	26.51	2.598
216	2011	25.53	2.576
217	2012	25.86	2.666
218	2013	26.69	2.584

	year	avg_temp	MOVE
262	2011	9.52	0.941
263	2012	9.51	0.957
264	2013	9.61	0.953
265	2014	9.57	0.932
266	2015	9.83	0.970

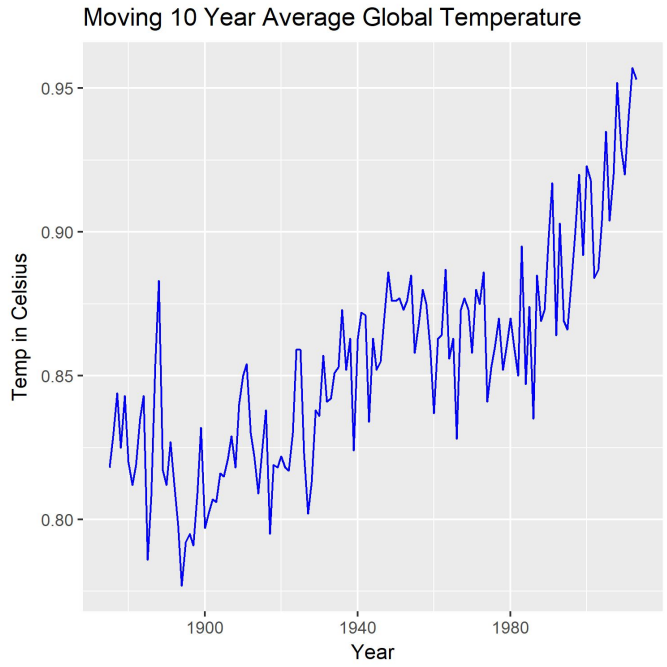
```
[98]: Temperature_Measure=cbind(Year=Local2$year,LocalTemp=Local2$MOVE,GlobalTemp=Global2$MOVE) #Combining all in same data frame
```

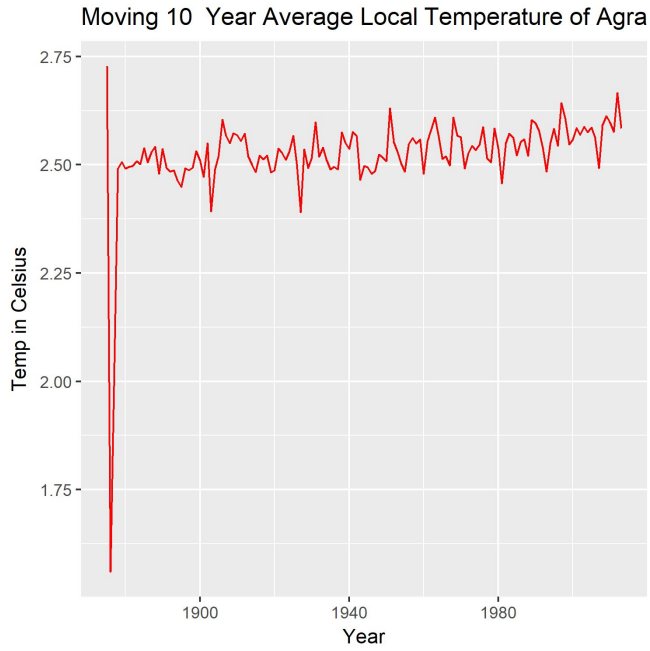
(R Code for Moving Average)

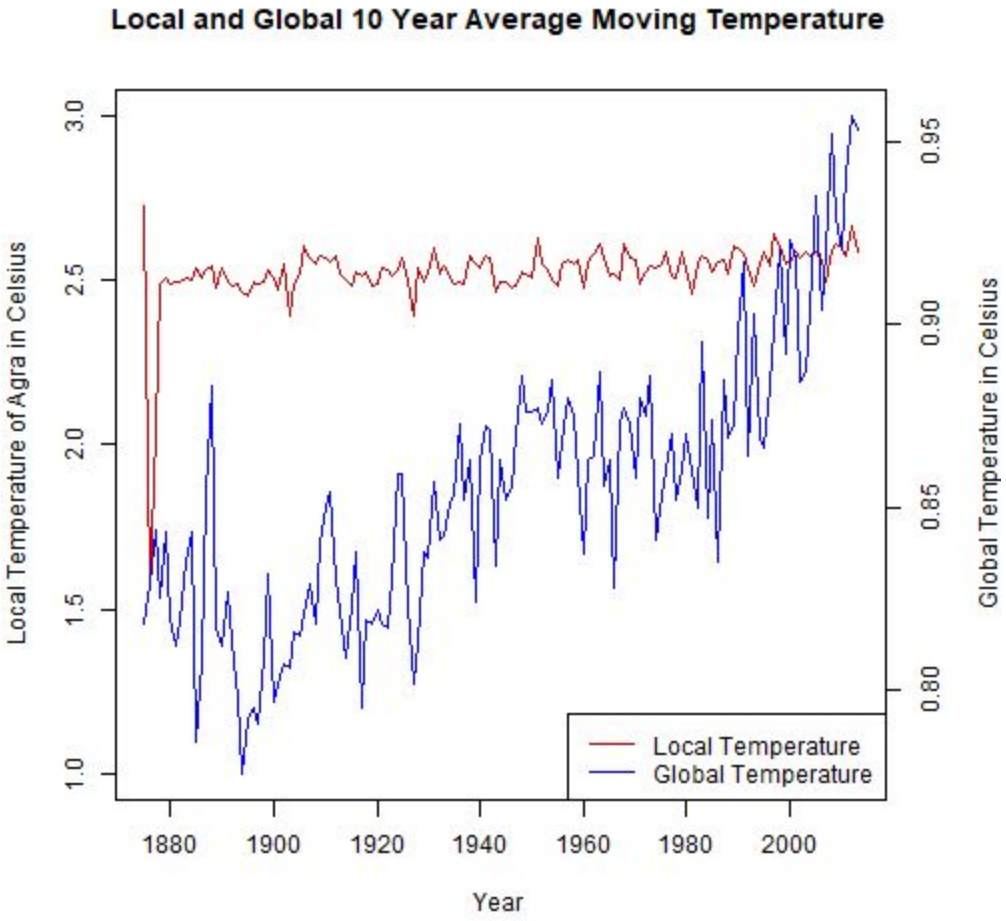
- What were your key considerations when deciding how to visualize the trends?
    - The Visualization should not be overwhelming to be distracting and be able to clearly communicate the idea that you want to present
    - Often the simple and effective visualization works best than colourful and Heavy visualization
    - The type of Visualization is very important and should be chosen according the idea that you want to represent . Skewness or distribution of the single univariate variable is best seen through histogram

---

-


Moving 10 Year Average Global Temperature
Temp in Celsius
0.95
0.90
0.85
0.80
1900
1940
1980
Year


Moving 10 Year Average Local Temperature of Agra
Temp in Celsius
2.75
2.50
2.25
2.00
1.75
1900
1940
1980
Year



- The local Temperature of the city Agra has been consistently higher than the global temperature with vast amount of difference between the temperature. This indicates that the Agra city might be in the hotter parts of the world
- Both the Lines indicate that line is rising which is showing that the world in general as a whole is getting hotter with every passing year
- The difference between the local and global temperature has been more or less consistent over time indicating global warming affecting the world equally
- The variation in Global Temperature over the year is much higher than the Local temperature. The local temperature of the city Agra has been hovering about 2.5 to 2.6 C with not too much depressions , however the the global temperature has not been not too consistent with heavy depressions in temperature at times along with the increase in temperature with higher slopes