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# JUNIOR NANODEGREE DATA ANALYST **PROJECT**

## EXPLORE GLOBAL TEMPERATURE TRENDS

## (A) What tools did you use for each step?

1. To extract the Global _data and City _data;
   i. I wrote a SQL query to extract the City _data

```
SELECT *
FROM City _data
WHERE City = 'Lagos';

EVALUATE OR CONTROL+ ENTER
```

   ii. I also wrote a SQL query to extract the Global _data

```
SELECT *
FROM Global _data;

EVALUATE OR CONTROL+ ENTER
```

   iii. Downloaded (*) all FROM City _data WHERE City = 'Lagos'
   iv. Downloaded (*) all FROM Global _data
   v. Opened the CSV in Excel worksheet

## (B) How did you calculate the moving average?

- **City _ data**

i. I started by plotting the line graph of the city data, using Lagos city.

ii. I also used the snipping tools to make a screen shot of my tables from excel.

| year | city | avg_temp | 10yrs MA | 20yrs MA |
|---|---|---|---|---|
| 1849 | Lagos | 25.98 | | |
| 1850 | Lagos | 25.87 | | |
| 1851 | Lagos | 26.1 | | |
| 1852 | Lagos | | | |
| 1853 | Lagos | | | |
| 1854 | Lagos | | | |
| 1855 | Lagos | | | |
| 1856 | Lagos | 26.35 | | |
| 1857 | Lagos | 25.45 | | |
| 1858 | Lagos | 25.92 | | |
| 1859 | Lagos | 26.18 | | |
| 1860 | Lagos | 26.01 | | |
| 1861 | Lagos | 25.95 | | |
| 1862 | Lagos | 25.9 | | |
| 1863 | Lagos | | | |
| 1864 | Lagos | | | |
| 1865 | Lagos | | | |

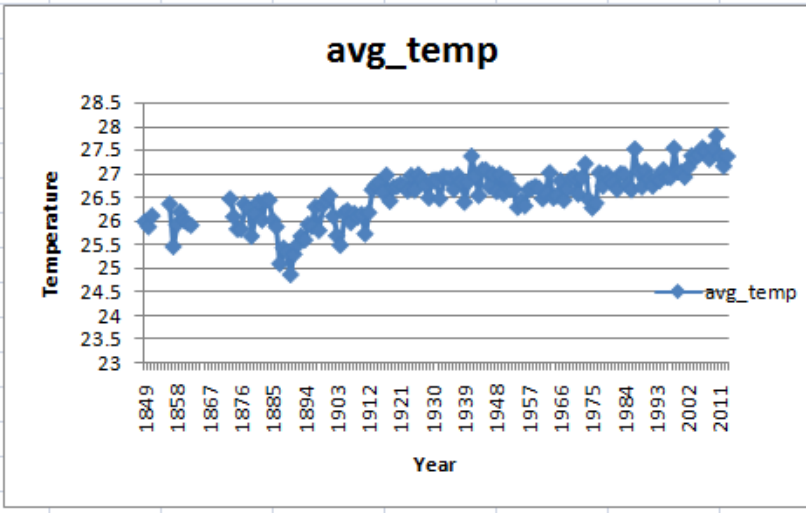



Figure 1.0 Avg_temp of the City _data

iii. Calculated and plotted the moving average of the city _data through year 1873.

a. 10 years moving average of Lagos city _data.

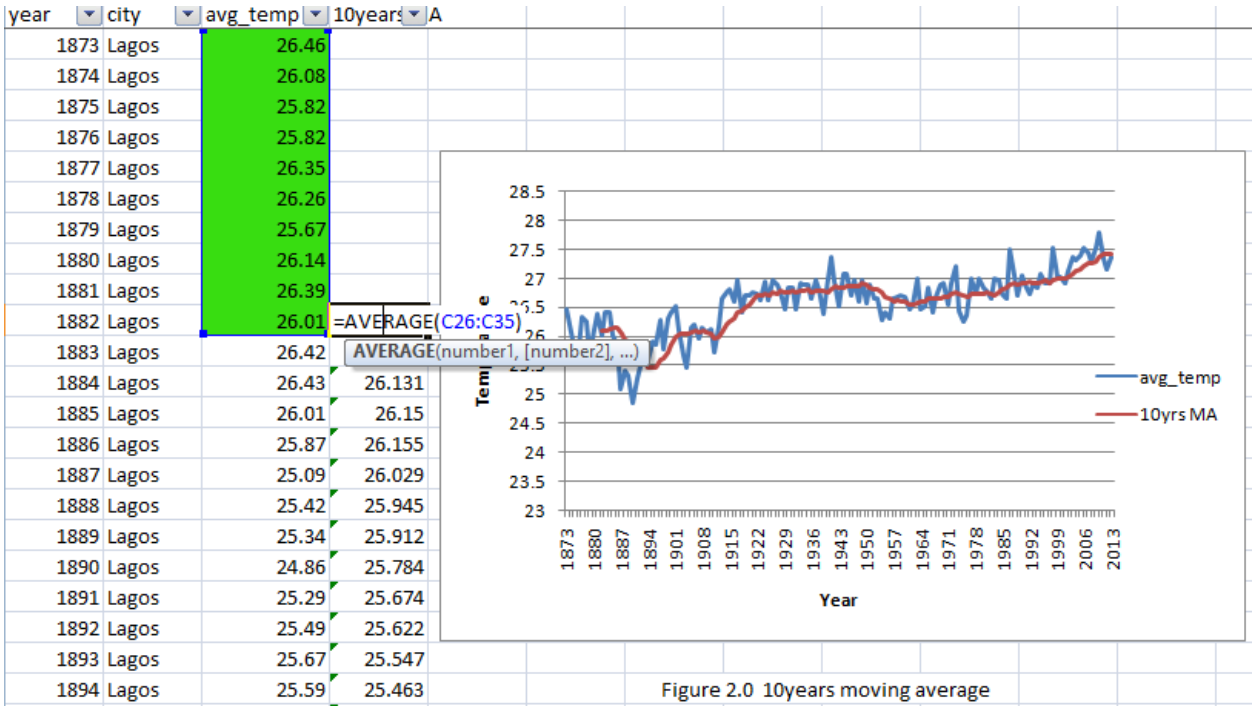


Figure 2.0 10years moving average

b. 20 years moving average of the city _data

| year | city | avg_temp | 10yrs MA | 20yrs MA |
|---|---|---|---|---|
| 1873 | Lagos | 26.46 | | |
| 1874 | Lagos | 26.08 | | |
| 1875 | Lagos | 25.82 | | |
| 1876 | Lagos | 25.82 | | |
| 1877 | Lagos | 26.35 | | |
| 1878 | Lagos | 26.26 | | |
| 1879 | Lagos | 25.67 | | |
| 1880 | Lagos | 26.14 | | |
| 1881 | Lagos | 26.39 | | |
| 1882 | Lagos | 26.01 | 26.1 | |
| 1883 | Lagos | 26.42 | 26.096 | |
| 1884 | Lagos | 26.43 | 26.131 | |
| 1885 | Lagos | 26.01 | 26.15 | |
| 1886 | Lagos | 25.87 | 26.155 | |
| 1887 | Lagos | 25.09 | 26.029 | |
| 1888 | Lagos | 25.42 | 25.945 | |
| 1889 | Lagos | 25.34 | 25.912 | |
| 1890 | Lagos | 24.86 | 25.784 | |
| 1891 | Lagos | 25.29 | 25.674 | |
| 1892 | Lagos | 25.49 | 25.622 | =AVERAGE(C26:C45) |
| 1893 | Lagos | 25.67 | 25.547 | AVERAGE(number1, [number2], ...) |
| 1894 | Lagos | 25.59 | 25.463 | 25.797 |

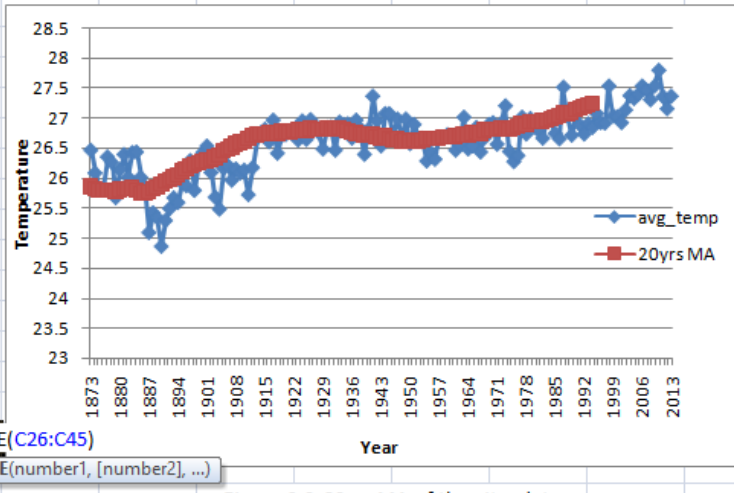



Figure 3.0 20yrs MA of the city_data

c. 30 years moving average of the city _data

| year | city | avg_temp | 10yrs MA | 20yrs MA | 30yrs MA |
|---|---|---|---|---|---|
| 1884 | Lagos | 26.43 | 26.131 | | |
| 1885 | Lagos | 26.01 | 26.15 | | |
| 1886 | Lagos | 25.87 | 26.155 | | |
| 1887 | Lagos | 25.09 | 26.029 | | |
| 1888 | Lagos | 25.42 | 25.945 | | |
| 1889 | Lagos | 25.34 | 25.912 | | |
| 1890 | Lagos | 24.86 | 25.784 | | |
| 1891 | Lagos | 25.29 | 25.674 | | |
| 1892 | Lagos | 25.49 | 25.622 | 25.861 | |
| 1893 | Lagos | 25.67 | 25.547 | 25.8215 | |
| 1894 | Lagos | 25.59 | 25.463 | 25.797 | |
| 1895 | Lagos | 25.92 | 25.454 | 25.802 | |
| 1896 | Lagos | 25.87 | 25.454 | 25.8045 | |
| 1897 | Lagos | 26.29 | 25.574 | 25.8015 | |
| 1898 | Lagos | 25.79 | 25.611 | 25.778 | |
| 1899 | Lagos | 26.31 | 25.708 | 25.81 | |
| 1900 | Lagos | 26.42 | 25.864 | 25.824 | |
| 1901 | Lagos | 26.53 | 25.988 | 25.831 | |
| 1902 | Lagos | 26.09 | 26.048 | 25.835 | =AVERAGE(C26:C55) |
| 1903 | Lagos | 25.68 | 26.049 | 25.798 | |
| 1904 | Lagos | 25.48 | 26.038 | 25.7505 | 25.87733 |
| 1905 | Lagos | 26.16 | 26.062 | 25.758 | 25.88867 |
| 1906 | Lagos | 26.21 | 26.096 | 25.775 | 25.90167 |
| 1907 | Lagos | 25.96 | 26.063 | 25.8185 | 25.88867 |

AVERAGE(number1, [number2], ...)

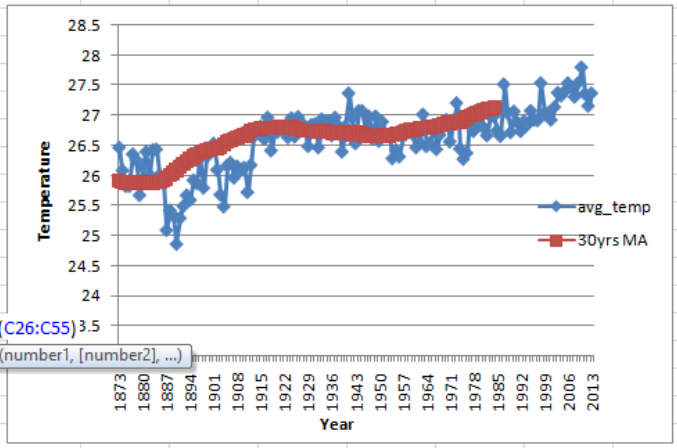



Figure 4.0 30yrs MA of the city _data

- **Global_data**

| year | Global_data |
|---|---|
| 1750 | 8.72 |
| 1751 | 7.98 |
| 1752 | 5.78 |
| 1753 | 8.39 |
| 1754 | 8.47 |
| 1755 | 8.36 |
| 1756 | 8.85 |
| 1757 | 9.02 |
| 1758 | 6.74 |
| 1759 | 7.99 |
| 1760 | 7.19 |
| 1761 | 8.77 |
| 1762 | 8.61 |
| 1763 | 7.5 |
| 1764 | 8.4 |

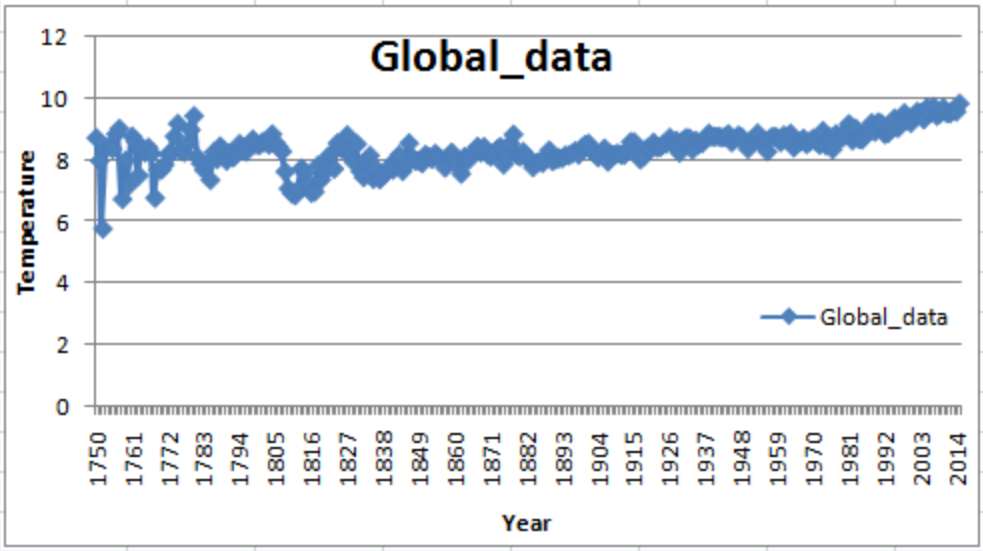



Figure 5.0 Global_data line graph

i. Calculated and plotted the moving average through year 1873, so as to compare with the city _data.

a. 10 years moving average of the global _data

| year | avg_temp | 10yrs MA |
|---|---|---|
| 1873 | 8.35 | |
| 1874 | 8.43 | |
| 1875 | 7.86 | |
| 1876 | 8.08 | |
| 1877 | 8.54 | |
| 1878 | 8.83 | |
| 1879 | 8.17 | |
| 1880 | 8.12 | |
| 1881 | 8.27 | |
| 1882 | 8.13 | =AVERAGE(B125:B134) |
| 1883 | 7.98 | |
| 1884 | 7.77 | 8.175 |
| 1885 | 7.92 | 8.181 |
| 1886 | 7.95 | 8.168 |
| 1887 | 7.91 | 8.105 |
| 1888 | 8.09 | 8.031 |
| 1889 | 8.32 | 8.046 |
| 1890 | 7.97 | 8.031 |
| 1891 | 8.02 | 8.006 |

AVERAGE(number1, [number2], ...)

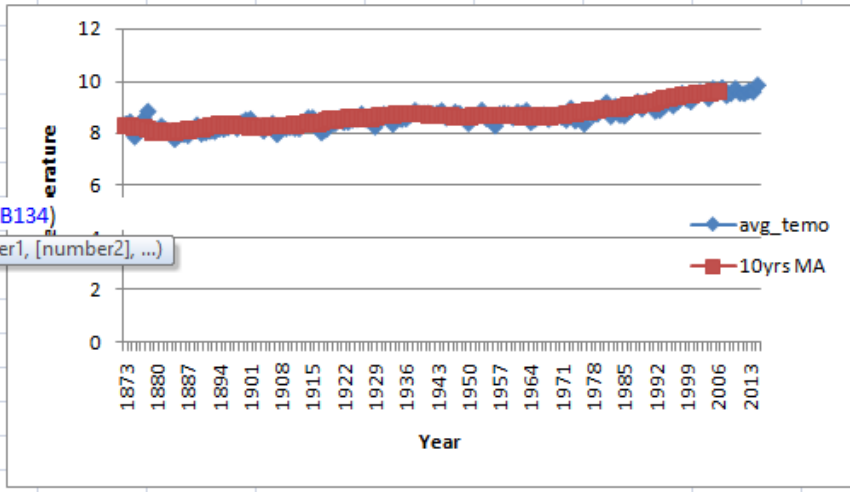



Figure 6.0 10yrs MA

b. 20 years moving average of the global _data

| year | avg_temp | 10yrs MA | 20yrs MA |
|---|---|---|---|
| 1873 | 8.35 | | |
| 1874 | 8.43 | | |
| 1875 | 7.86 | | |
| 1876 | 8.08 | | |
| 1877 | 8.54 | | |
| 1878 | 8.83 | | |
| 1879 | 8.17 | | |
| 1880 | 8.12 | | |
| 1881 | 8.27 | | |
| 1882 | 8.13 | 8.278 | |
| 1883 | 7.98 | 8.241 | |
| 1884 | 7.77 | 8.175 | |
| 1885 | 7.92 | 8.181 | |
| 1886 | 7.95 | 8.168 | |
| 1887 | 7.91 | 8.105 | |
| 1888 | 8.09 | 8.031 | |
| 1889 | 8.32 | 8.046 | |
| 1890 | 7.97 | 8.031 | |
| 1891 | 8.02 | 8.006 | |
| 1892 | 8.07 | 8 | =AVERAGE(B125:B144) |
| 1893 | 8.06 | 8.008 | AVERAGE(number1, [number2], ...) |

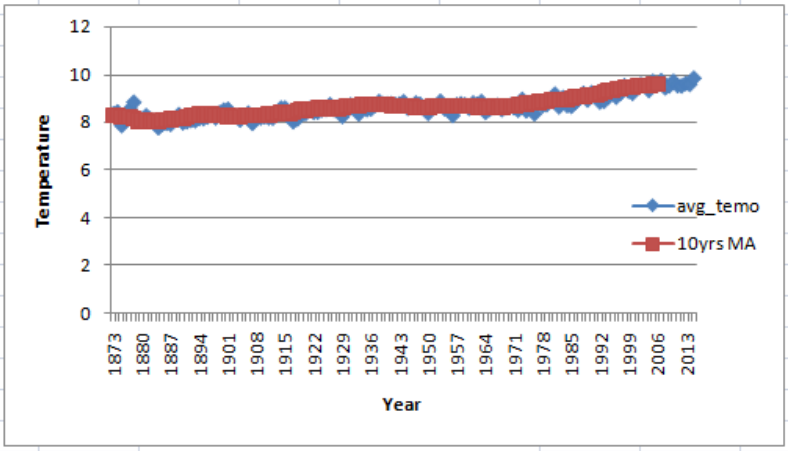



Figure 6.0 10yrs MA

c. 30 years moving average of the global _data

| year | avg_temp | 10yrs MA | 20yrs MA | 30yrs MA |
|---|---|---|---|---|
| 1883 | 7.98 | 8.241 | | |
| 1884 | 7.77 | 8.175 | | |
| 1885 | 7.92 | 8.181 | | |
| 1886 | 7.95 | 8.168 | | |
| 1887 | 7.91 | 8.105 | | |
| 1888 | 8.09 | 8.031 | | |
| 1889 | 8.32 | 8.046 | | |
| 1890 | 7.97 | 8.031 | | |
| 1891 | 8.02 | 8.006 | | |
| 1892 | 8.07 | 8 | 8.139 | |
| 1893 | 8.06 | 8.008 | 8.1245 | |
| 1894 | 8.16 | 8.047 | 8.111 | |
| 1895 | 8.15 | 8.07 | 8.1255 | |
| 1896 | 8.21 | 8.096 | 8.132 | |
| 1897 | 8.29 | 8.134 | 8.1195 | |
| 1898 | 8.18 | 8.143 | 8.087 | |
| 1899 | 8.4 | 8.151 | 8.0985 | |
| 1900 | 8.5 | 8.204 | 8.1175 | |
| 1901 | 8.54 | 8.256 | 8.131 | |
| 1902 | 8.3 | 8.279 | 8.1395 | =AVERAGE(B125:B154) |
| 1903 | 8.22 | 8.295 | 8.1515 | AVERAGE(number1, [number2], ...) |
| 1904 | 8.09 | 8.288 | 8.1675 | 8.17 |
| 1905 | 8.23 | 8.296 | 8.183 | 8.182333 |

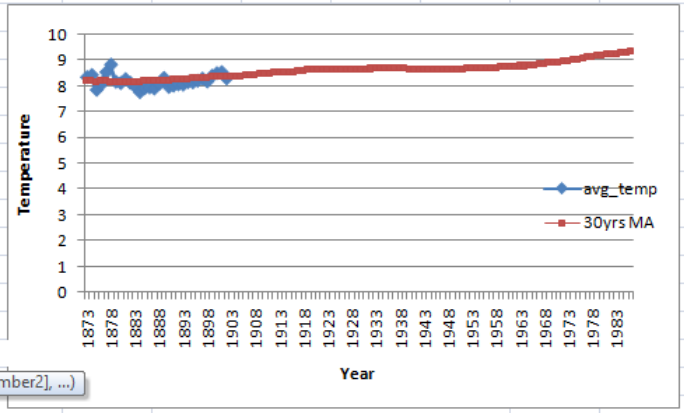


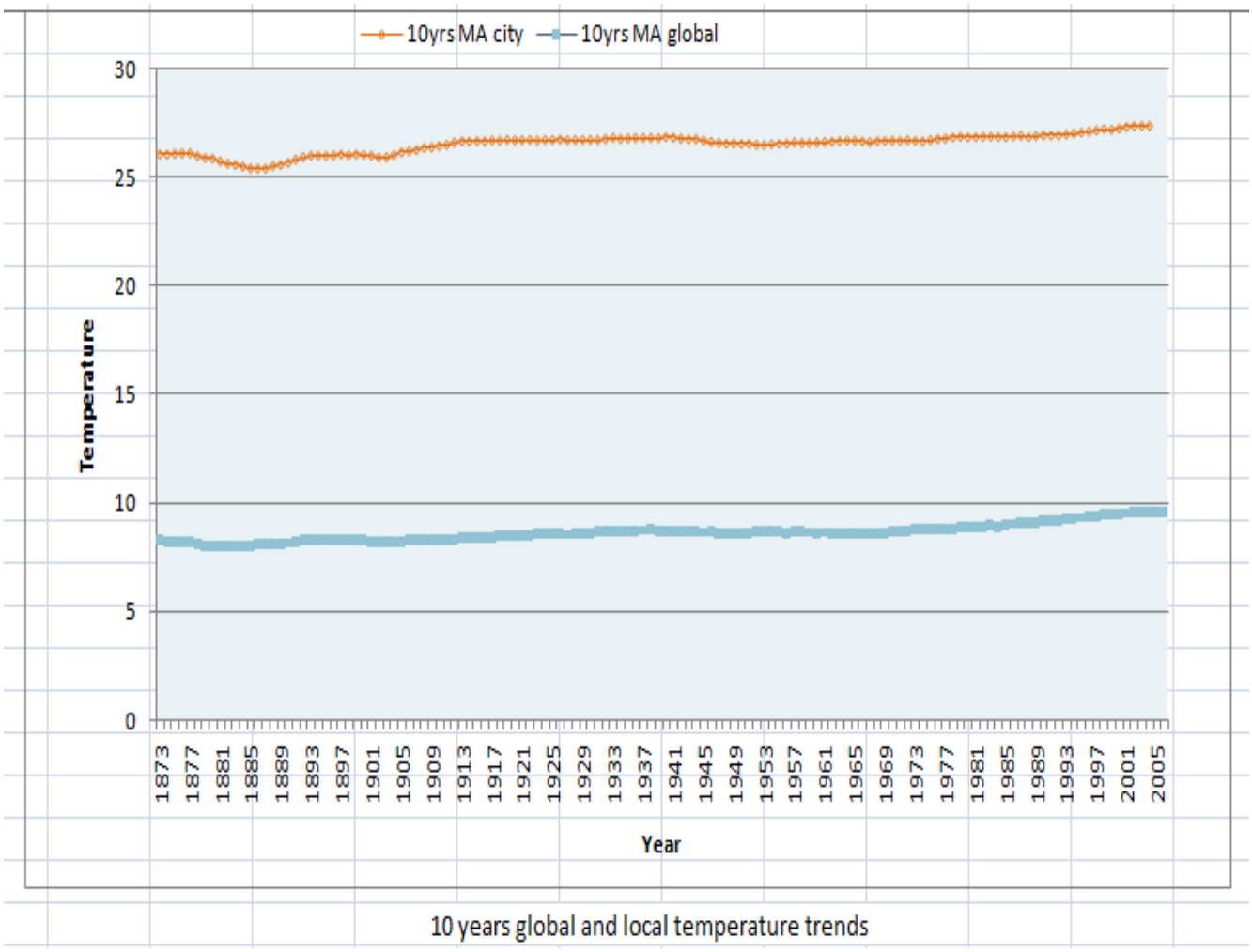

Figure 7.0 30 years moving average

## (C) Key considerations when deciding how to visualize trends?

As we can see, the data for city _data (Lagos) for year 1849 – 1851, thinned out and was not captured, which suggests that data from year 1852 – 1855 is missing. Then from year 1856 – 1862 was captured, but from year 1863 – 1872 was not captured. Therefore I carried out my data visualization for the range between years 1873 – 2013 . The global temperature data was properly captured from year 1750 – 2015.

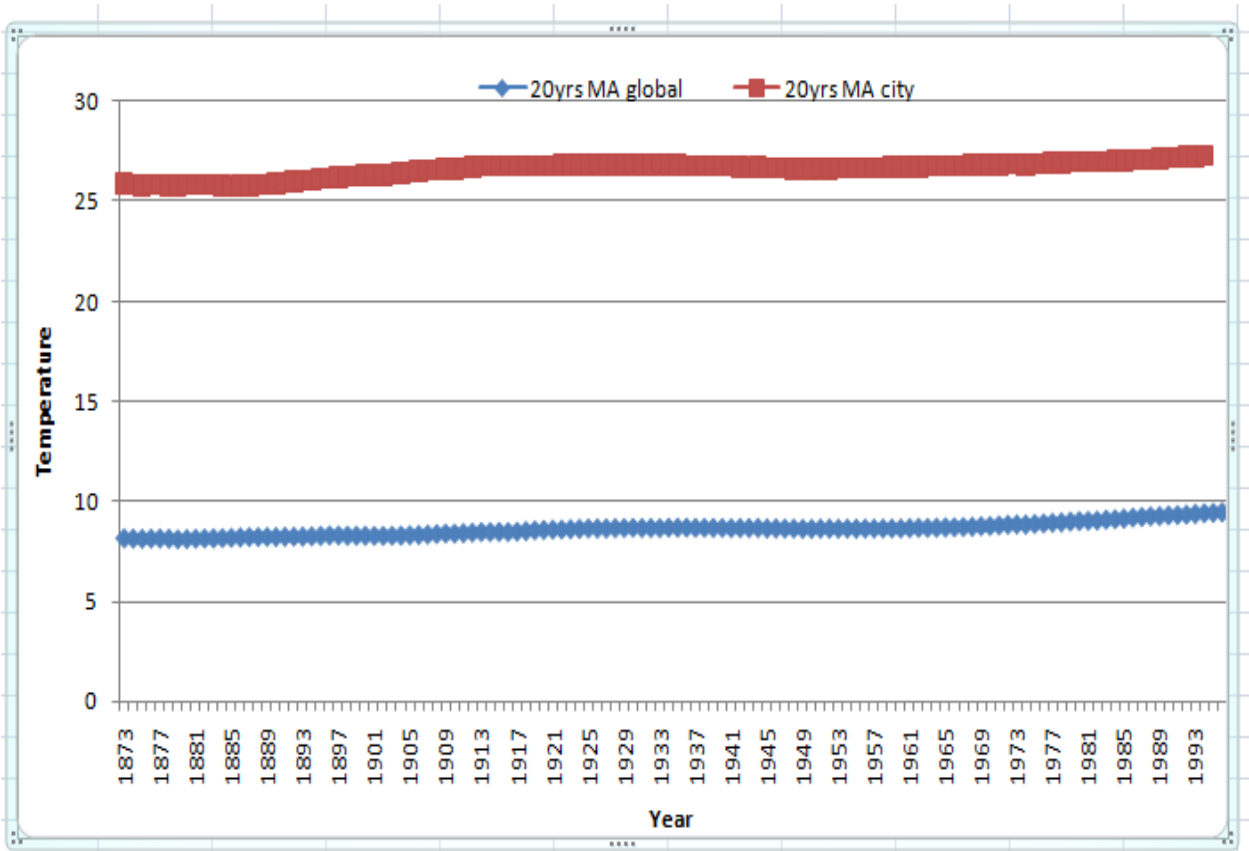
## (D) Line chart with global and local temperature trends.

i. 10 years global and local temperature trends



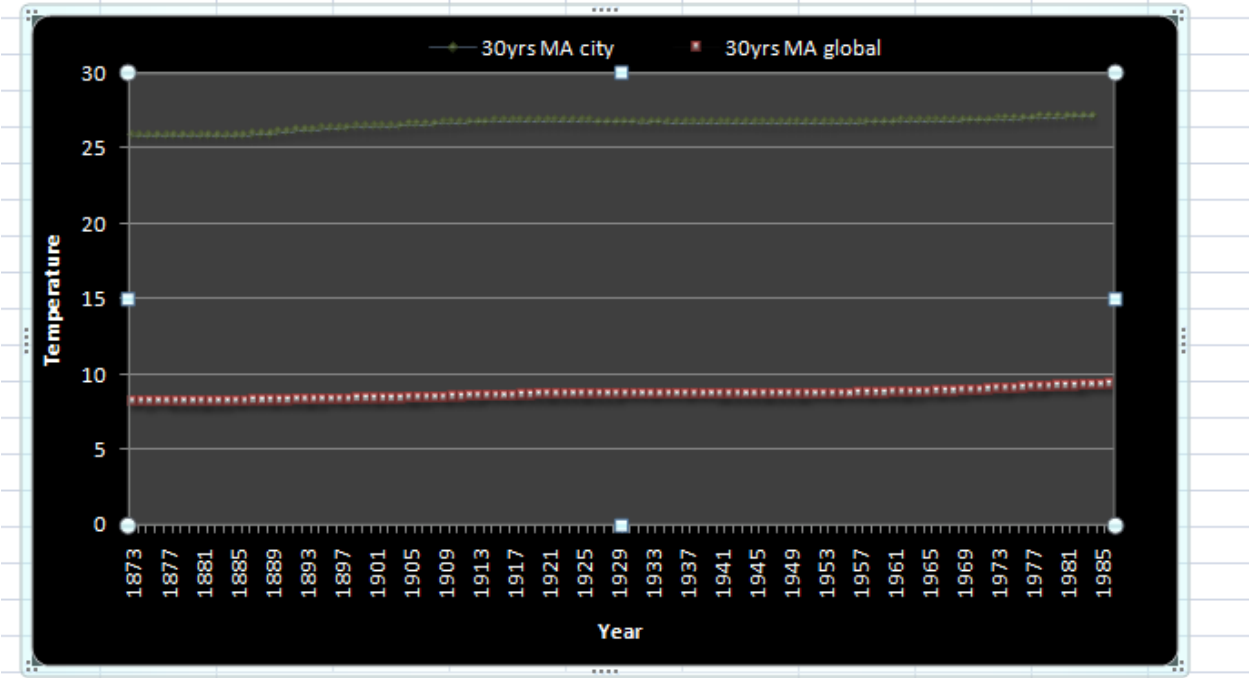

10 years global and local temperature trends

ii. 20 years global and local temperature trends



20 years global and local temperature trends

iii. 30 years global and local temperature trends



30 years global and local temperature trends

## (E) Observations

1. Similarities and differences/or in the trends

| year | city avg_temp | city level_temp | year | global avg_temp | global level_data |
|---|---|---|---|---|---|
| 1873 | 26.46 | High | 1873 | 8.35 | High |
| 1874 | 26.08 | Low | 1874 | 8.43 | High |
| 1875 | 25.82 | Low | 1875 | 7.86 | Low |
| 1876 | 25.82 | Low | 1876 | 8.08 | Low |
| 1877 | 26.35 | Low | 1877 | 8.54 | High |
| 1878 | 26.26 | Low | 1878 | 8.83 | High |
| 1879 | 25.67 | Low | 1879 | 8.17 | Low |
| 1880 | 26.14 | Low | 1880 | 8.12 | Low |
| 1881 | 26.39 | Low | 1881 | 8.27 | Low |
| 1882 | 26.01 | Low | 1882 | 8.13 | Low |
| 1883 | 26.42 | Low | 1883 | 7.98 | Low |
| 1884 | 26.43 | Low | 1884 | 7.77 | Low |
| 1885 | 26.01 | Low | 1885 | 7.92 | Low |
| 1886 | 25.87 | Low | 1886 | 7.95 | Low |
| 1887 | 25.09 | Low | 1887 | 7.91 | Low |
| 1888 | 25.42 | Low | 1888 | 8.09 | Low |
| 1889 | 25.34 | Low | 1889 | 8.32 | Low |
| 1890 | 24.86 | Low | 1890 | 7.97 | Low |
| 1891 | 25.29 | Low | 1891 | 8.02 | Low |
| 1892 | 25.49 | Low | 1892 | 8.07 | Low |
| 1893 | 25.67 | Low | 1893 | 8.06 | Low |
| 1894 | 25.59 | Low | 1894 | 8.16 | Low |

Similarities and/or differences in the trends

2. Differences in the trends

| year | city avg_temp | city level_temp | year | global avg_temp | global level_data | difference |
|---|---|---|---|---|---|---|
| 1873 | 26.46 | High | 1873 | 8.35 | High | =(B2-F2) |
| 1874 | 26.08 | Low | 1874 | 8.43 | High | 17.65 |
| 1875 | 25.82 | Low | 1875 | 7.86 | Low | 17.96 |
| 1876 | 25.82 | Low | 1876 | 8.08 | Low | 17.74 |
| 1877 | 26.35 | Low | 1877 | 8.54 | High | 17.81 |
| 1878 | 26.26 | Low | 1878 | 8.83 | High | 17.43 |
| 1879 | 25.67 | Low | 1879 | 8.17 | Low | 17.5 |

- Lagos city data is a bit messy, there were missing  data(s) .
- Lagos is hotter than the global temperature, if you take a look at the data gotten from Lagos city versus the Global data.
- The Local and Global temperature data are both rising leading towards global warming.
- The highest average temperature in the city data was 27.79 in the year 2010 and while the highest average temperature in the global data was 9.7 in 2010 also.
- The lowest average temperature in the city data was 24.86 in 1890 and while the lowest average temperature in the global data was 7.77 in 1884.