

# Explore Weather Trends

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## Target of this Project

In this project, I will analyze Allahabad where i.e my nearest city temperature data and global temperature and compare the temperature trends of them.

## Extract the data

Write a SQL query to extract the city level data. Export to CSV.

```
SELECT *
```

```
FROM city_data
```

```
WHERE city = 'Allahabad' ;
```

Write a SQL query to extract the global data. Export to CSV.

```
SELECT *
```

```
FROM global_data ;
```

## Temperature data analysis

Use python data analyze model "pandas" to analysis and loading csv file.

In [3]:

```
1 import pandas as pd
2 import numpy as np
3 import matplotlib.pyplot as plt
4 from sklearn.linear_model import LinearRegression
5 import seaborn as sns
6 %matplotlib inline
```

In [9]:

```
1 city_data=pd.read_csv('allahabad.csv').drop({'city','country'},axis=1).dropna()
2 city_data.head()
3
```

Out[9]:

	year	avg_temp
0	1796	25.32
1	1797	26.86
2	1798	24.49
3	1799	25.59
4	1800	25.54

In [6]:

```
1 city_data.head()
```

Out[6]:

	year	avg_temp
0	1796	25.32
1	1797	26.86
2	1798	24.49
3	1799	25.59
4	1800	25.54

In [7]:

```
1 global_data=pd.read_csv('global_data.csv')
2 global_data.head()
```

Out[7]:

	year	avg_temp
0	1750	8.72
1	1751	7.98
2	1752	5.78
3	1753	8.39
4	1754	8.47

In [10]:

```
1 global_data1=global_data.iloc[46:264]
2 global_data1.head()
```

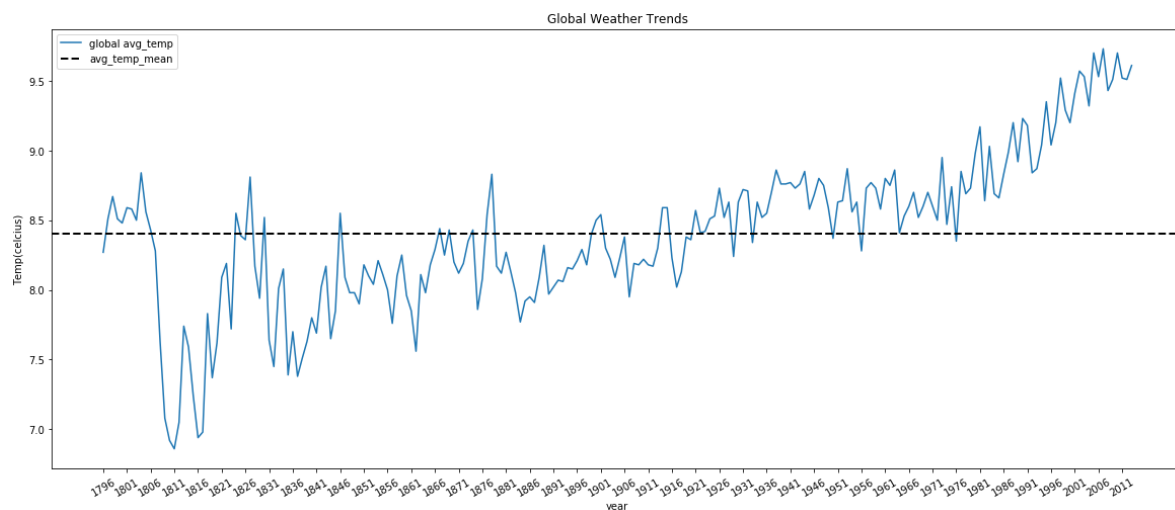
Out[10]:

	year	avg_temp
46	1796	8.27
47	1797	8.51
48	1798	8.67
49	1799	8.51
50	1800	8.48

## plot

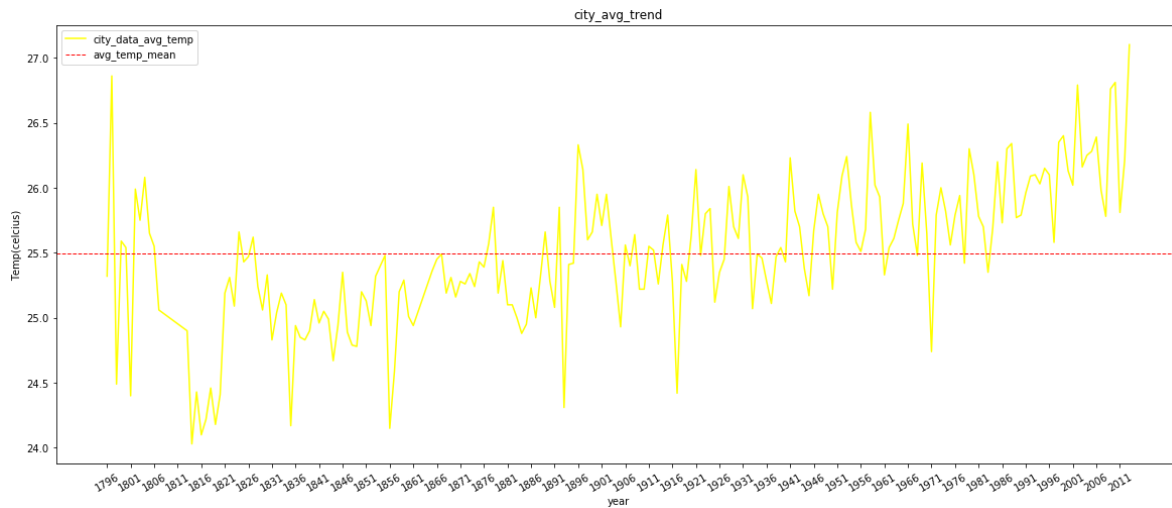
In [44]:

```
1 plt.figure(figsize=(20,8))
2 plt.plot(global_data1.year,global_data1.avg_temp,label='global avg_temp')
3 plt.axhline(global_data1.avg_temp.mean(),linestyle='dashed',color='black',linewidth=2,
4 plt.legend()
5 plt.xlabel('year')
6 plt.ylabel('Temp(celcius)')
7 plt.title('Global Weather Trends')
8 plt.xticks(np.arange(1796,2013,5),rotation=30)
9 plt.show()
```



In [45]:

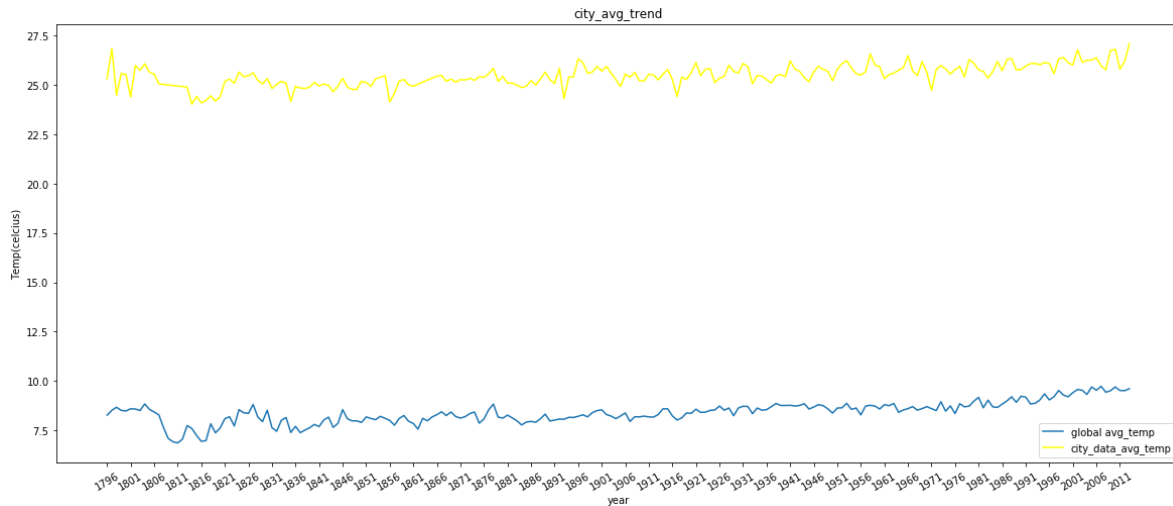
```
1 plt.figure(figsize=(20,8))
2 plt.plot(city_data.year,city_data.avg_temp,color='yellow',label='city_data_avg_temp')
3 plt.axhline(city_data.avg_temp.mean(),color='r',linestyle='dashed',linewidth=1,label='')
4 plt.legend()
5 plt.xlabel('year')
6 plt.ylabel('Temp(celcius)')
7 plt.title('city_avg_trend')
8 plt.xticks(np.arange(1796,2013,step=5),rotation=30)
9 plt.show()
10
```



## comparision of my city data vs global data

In [15]:

```
1 plt.figure(figsize=(20,8))
2 plt.plot(global_data1.year,global_data1.avg_temp,label='global avg_temp')
3 plt.plot(city_data.year,city_data.avg_temp,color='yellow',label='city_data_avg_temp')
4 plt.legend()
5 plt.xlabel('year')
6 plt.ylabel('Temp(celcius)')
7 plt.title('city_avg_trend')
8 plt.xticks(np.arange(1796,2013,step=5),rotation=30)
9 plt.show()
```



To observation Allahabad(my city data) and global weather trends fold lines,it's hard to anaylze weather trends.Because of the fold line fluctuates by years,with moving temperature could be solve the problem.

## Moving average and plots

implementing code for moving average for both

In [46]:

```

1 city_data['moving_avg'] = 0.0
2 city_data['moving_avg']=city_data['avg_temp'].rolling(window=7).mean()
3 city_data.head(300)

```

Out[46]:

	year	avg_temp	moving_avg
0	1796	25.32	NaN
1	1797	26.86	NaN
2	1798	24.49	NaN
3	1799	25.59	NaN
4	1800	25.54	NaN
...	...	...	...
213	2009	26.76	26.228571
214	2010	26.81	26.321429
215	2011	25.81	26.258571
216	2012	26.21	26.248571
217	2013	27.10	26.350000

210 rows × 3 columns

In [47]:

```

1 global_data1['moving_avg']=0.0
2 global_data1['moving_avg']=global_data1['avg_temp'].rolling(window=7).mean()

```

C:\Users\RISHABH\Anaconda3\lib\site-packages\ipykernel\_launcher.py:1: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: [http://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy) ([http://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy))

"""Entry point for launching an IPython kernel.

C:\Users\RISHABH\Anaconda3\lib\site-packages\ipykernel\_launcher.py:2: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row\_indexer,col\_indexer] = value instead

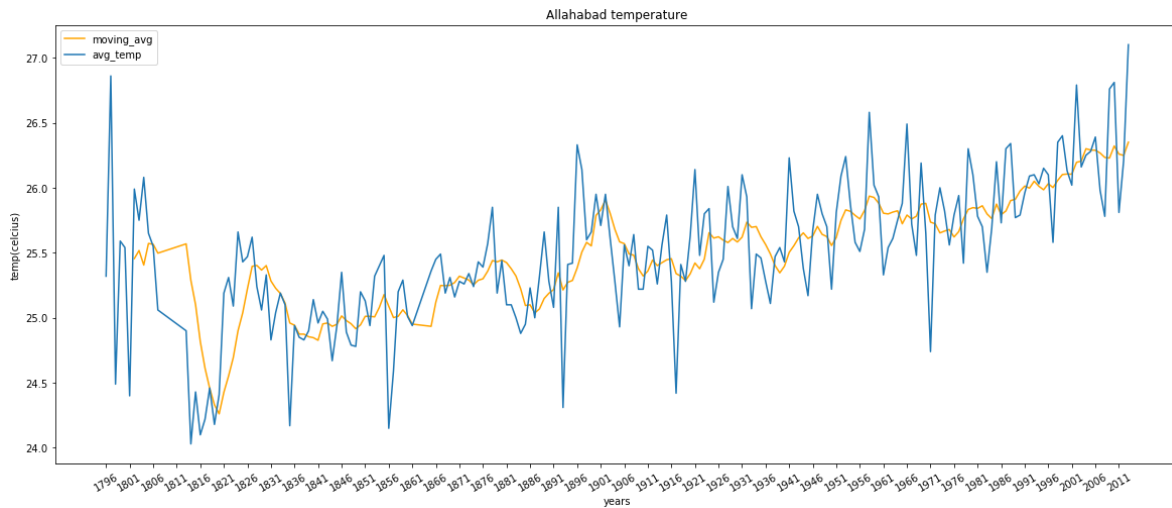
See the caveats in the documentation: [http://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy) ([http://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy))

In [67]:

```

1 plt.figure(figsize=(20,8))
2 plt.plot(city_data.year,city_data.moving_avg,color='orange',label='moving_avg')
3 plt.plot(city_data.year,city_data.avg_temp,label='avg_temp')
4 plt.xlabel('years')
5 plt.ylabel('temp(celcius)')
6 plt.legend()
7 plt.title('Allahabad temperature')
8 plt.xticks(np.arange(1796,2013,5),rotation=30)
9 plt.show()

```

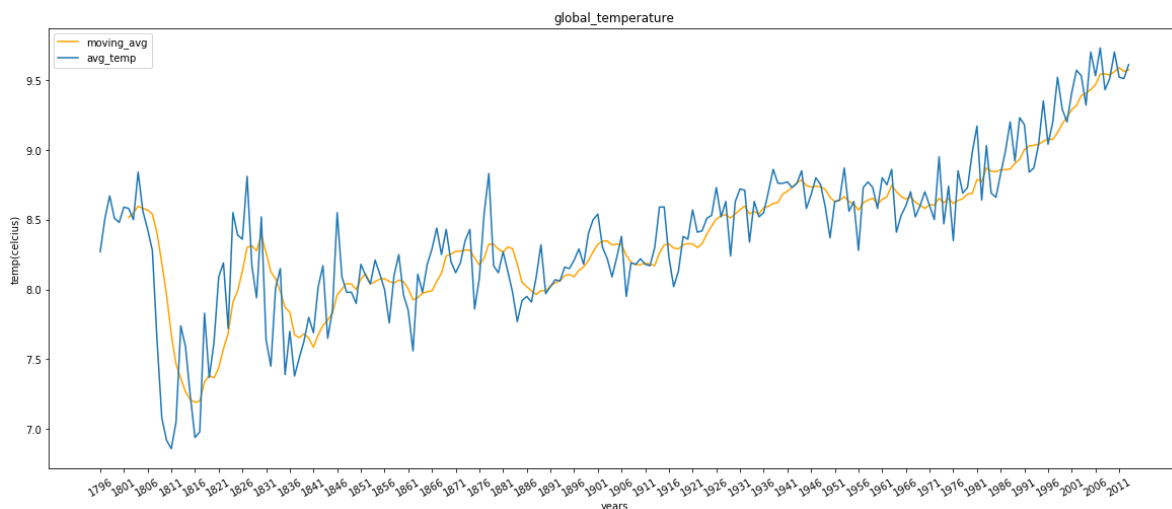


In [68]:

```

1 plt.figure(figsize=(20,8))
2 plt.plot(global_data1.year,global_data1.moving_avg,color='orange',label='moving_avg')
3 plt.plot(global_data1.year,global_data1.avg_temp,label='avg_temp')
4 plt.xlabel('years')
5 plt.ylabel('temp(celcius)')
6 plt.legend()
7 plt.title('global_temperature')
8 plt.xticks(np.arange(1796,2013,5),rotation=30)
9 plt.show()

```



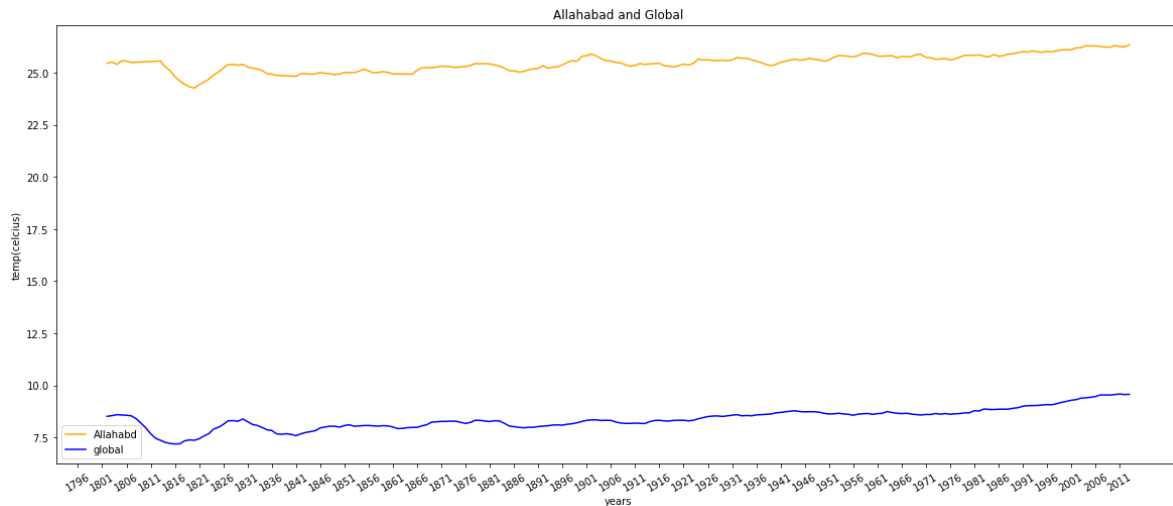
plot for city(allahabad) and global

In [69]:

```

1 plt.figure(figsize=(20,8))
2 plt.plot(city_data.year,city_data.moving_avg,color='orange',label='Allahabd')
3 plt.plot(global_data1.year,global_data1.moving_avg,color='blue',label='global')
4 plt.xlabel('years')
5 plt.ylabel('temp(celcius)')
6 plt.legend()
7 plt.title('Allahabad and Global')
8 plt.xticks(np.arange(1796,2013,5),rotation=30)
9 plt.show()

```



## Analysis and Summary

In [66]:

```

1 city_data['moving_avg'].describe()

```

Out[66]:

```

count    204.000000
mean      25.480735
std        0.412720
min       24.261429
25%       25.222857
50%       25.491429
75%       25.787143
max       26.350000
Name: moving_avg, dtype: float64

```



In [65]:

```
1 global_data1['moving_avg'].describe()
```

Out[65]:

```
count      212.000000
mean        8.386132
std         0.490843
min         7.191429
25%         8.061786
50%         8.325000
75%         8.652857
max         9.588571
Name: moving_avg, dtype: float64
```

1.Is your city hotter or cooler on average compared to the global average? Has the difference been consistent over time?

ANS:-yes my city (allahabad) is hotter than the average global average temperature because in my city south asia and here so much humidity,that's why my city average temperatur is hot. yes,there is difference about 17 degree celsius if we are talking about moving average.

2.How do the changes in your city's temperatures over time compare to the changes in the global average?

Ans:-In my city the minimum moving\_avg temperature is around 24 and maximum moving temperature is about 26 then there is little difference i.e 2 degree celcius.when we looking on global there is change between max and min,the difference is 1 degree celcius.

3-What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?

Ans:-To observation the whole weather trends the world is getting hotter and allahabd as well,experically in last few hundred years.from san francisco 7 years moving average plot is clearly to shows start from 1827 the temperature has rising up .

In conclusion,from the fold lines have same up-trend that can be predict global and Allahabad temperature will continue to raising up.

4-Is that will effect on global ecosystem or human living actuality?

Ans:-That will have more research to determine it.