weather_trend

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1 Data Analyst Nanodegree Project 0

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In this project, We will analyze local and global temperature data and compare the temperature trends where I live to overall global temperature trends.

Step 1: Fetching data and converting it to CSV Downloaded all the 3 datasets using the following SQL Queries.

```
SELECT * FROM city_data;
```

```
SELECT * FROM global_data;
```

```
SELECT * FROM city_list;
```

All the *.csv are added to the workspace "Project0" folder.

Step 2: Importing the data Used Pandas, matplotlib and seaborn for data analysis.

[72]:
```
#importing packages
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%pdb
%matplotlib inline
%config InlineBackend.figure_format = 'retina'#to have high resolution image
```

```
Automatic pdb calling has been turned ON
```

[52]:
```
global_data = pd.read_csv("global_data.csv")
city_data = pd.read_csv("city_data.csv")
city_list = pd.read_csv("city_list.csv")
```

Step 3: Preview Data

[53]:
```
global_data.head()
```

[53]:
```
   year  avg_temp
0  1750      8.72
1  1751      7.98
2  1752      5.78
3  1753      8.39
4  1754      8.47
```

[54]:
```
city_data.head()
```

[54]:
```
   year     city        country  avg_temp
0  1849  Abidjan  Côte D'Ivoire     25.58
1  1850  Abidjan  Côte D'Ivoire     25.52
2  1851  Abidjan  Côte D'Ivoire     25.67
3  1852  Abidjan  Côte D'Ivoire       NaN
4  1853  Abidjan  Côte D'Ivoire       NaN
```

[55]:
```
city_list.head()
```

[55]:
```
        city               country
0    Abidjan         Côte D'Ivoire
1  Abu Dhabi  United Arab Emirates
2      Abuja               Nigeria
3      Accra                 Ghana
4      Adana                Turkey
```

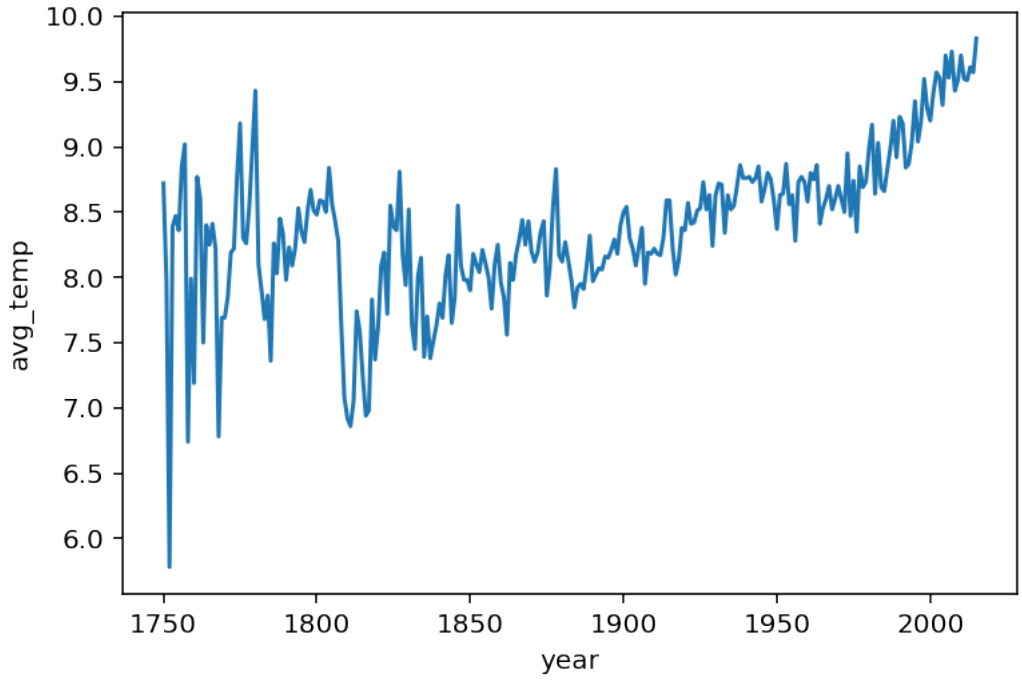
[56]:
```
# filltering banglore data from city data
city_blr = city_data[city_data["city"] == "Bangalore"]
city_blr.head()
```

[56]:
```
      year       city country  avg_temp
6367  1796  Bangalore   India     24.49
6368  1797  Bangalore   India     25.18
6369  1798  Bangalore   India     24.65
6370  1799  Bangalore   India     24.81
6371  1800  Bangalore   India     24.85
```

Step 4 : Visualizing Data

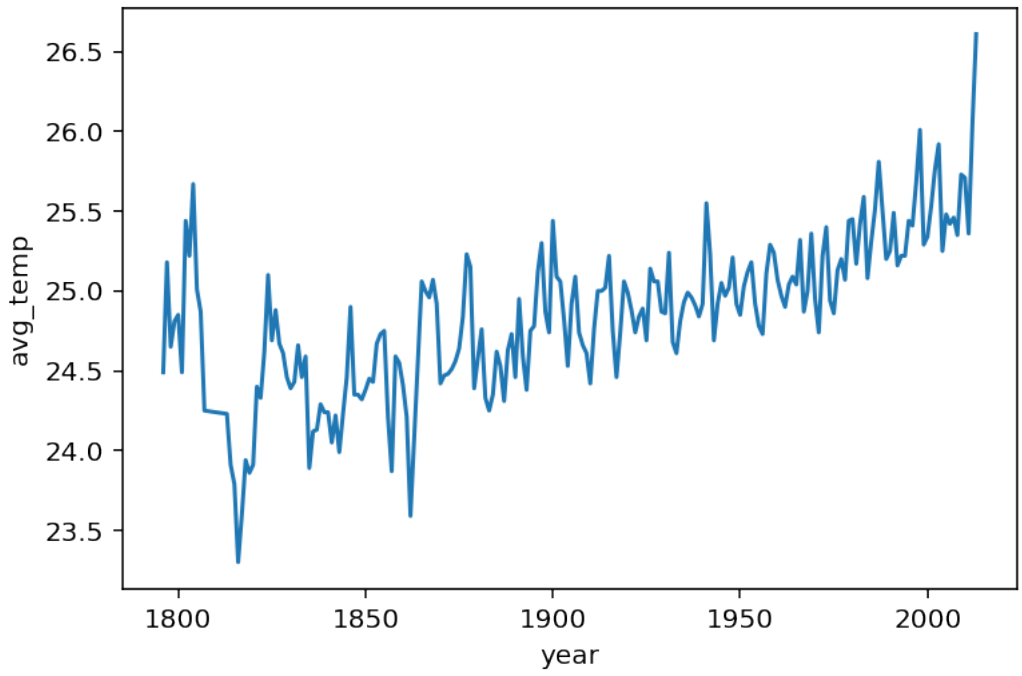
[57]:
```
# plotting graph for global data
sns.lineplot(x = "year",y = "avg_temp",data = global_data)
```

[57]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1dd1bddeb70>
```



[58]:
```
# plotting graph for Banglore city
sns.lineplot(x = "year", y = "avg_temp",data = city_blr)
```

[58]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1dd190007f0>
```



[59]:
```
# Calculated rolling average for global data
global_data=global_data.assign(rolling_gavg=global_data['avg_temp'].rolling(5).
 ↪mean())
global_data.head()
```

[59]:

	year	avg_temp	rolling_gavg
0	1750	8.72	NaN
1	1751	7.98	NaN
2	1752	5.78	NaN
3	1753	8.39	NaN
4	1754	8.47	7.868

[60]:
```
# Calculated rolling average for Bangalore data
city_blr=city_blr.assign(rolling_gavg=city_blr['avg_temp'].rolling(5).mean())
city_blr.head()
```

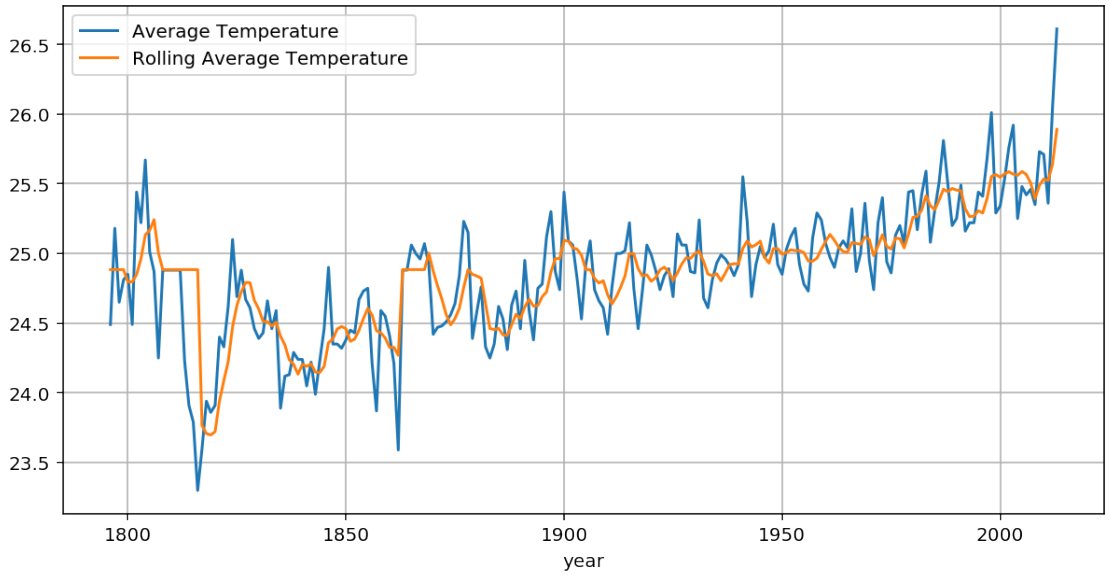
[60]:

	year	city	country	avg_temp	rolling_gavg
6367	1796	Bangalore	India	24.49	NaN
6368	1797	Bangalore	India	25.18	NaN
6369	1798	Bangalore	India	24.65	NaN
6370	1799	Bangalore	India	24.81	NaN
6371	1800	Bangalore	India	24.85	24.796

[62]:
```
#finding missing values in local data for average and rolling average␣
 ↪temperatures and filling it with respective median
sum(city_blr["avg_temp"].isna())
median=city_blr["avg_temp"].median()
city_blr["avg_temp"].fillna(median,inplace=True)
median1=city_blr["rolling_gavg"].median()
city_blr["rolling_gavg"].fillna(median1,inplace=True)
```

[63]:
```
#plotting graph for average temperature vs rolling average temperature of␣
 ↪bangalore data
city_blr.plot(x="year", y=␣
 ↪['avg_temp','rolling_gavg'],figsize=(10,5),grid=True,label = ['Average␣
 ↪Temperature','Rolling Average Temperature'])
```

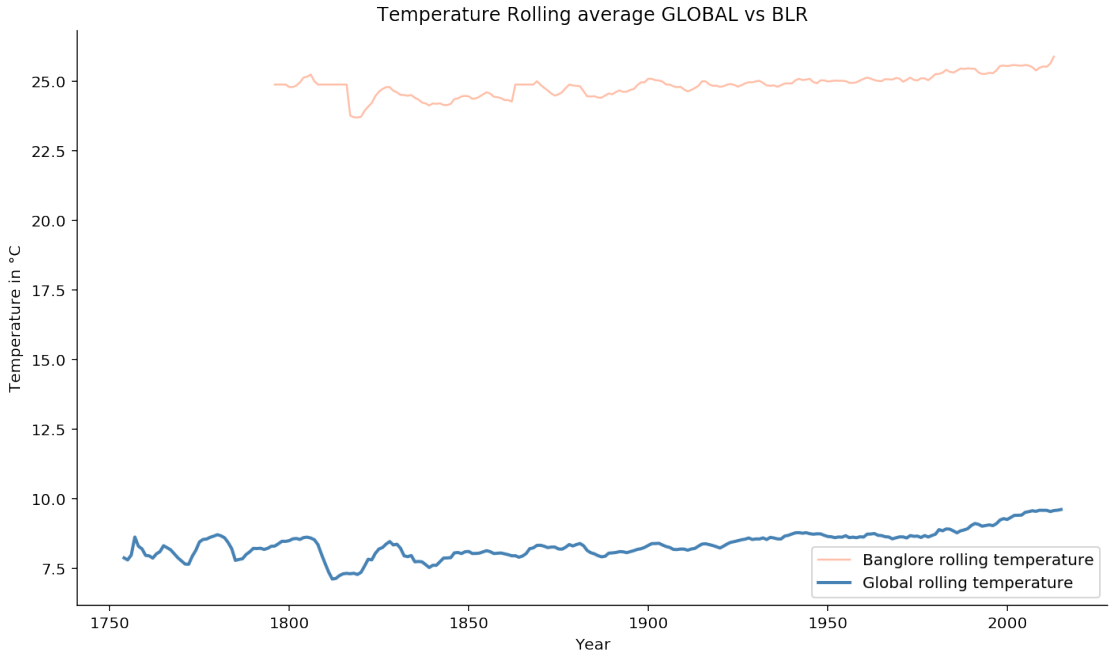
[63]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1dd190c39b0>
```



[70]:
```
#graph for rolling average temperature for global and bangalore data
#create a matplotlib figure and axes
fig, ax = plt.subplots(figsize = (10,6))

#plot the global data with a lineplot
sns.lineplot(x = "year", y = "rolling_gavg", data = city_blr , label =␣
 ↪"Banglore rolling temperature", alpha = 0.5,
             color = "coral", lw = 1.2)
sns.lineplot(x = "year", y = "rolling_gavg", data = global_data , label =␣
 ↪"Global rolling temperature",
             color = "steelblue", lw = 2)
 #set the y label of the plot
ax.set_ylabel("Temperature in řC")
#set the x label of the plot
ax.set_xlabel("Year")
#set the title of the plot
ax.set_title("Temperature Rolling average GLOBAL vs BLR")
#disable the right and top spine for better look
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
#tighten the plot layout
plt.tight_layout()

#show the plot (basically not necessary for jupyter but I always put it at the␣
 ↪end)
plt.show()
```



1.1 Summary

- *Bangalore average temperature is hotter than the global temperature and diffrence is consistent over years Banglore is about 13.5 degrees hotter than the global temperature*
- *Banglore temperature always varied around 23 degree to 26 degrees whereas global temperature varied between 6 degree to 10 degree However both the temperatures are consistent in their variations*
- *It can be observed that there is a sudden dip in global and local temperatures at the beginning of 19th century where both trends decreased by about 1.5 degrees*
- *To summarise, there is an overall increase in temperature over years in both globally and locally*

[ ]: