Exploring Weather Trends

In this project, we will analyze local and global temperature data and compare the temperature trends of London UK to overall global temperature trends.

Python Pandas were used to extract data from CSV file and calculate moving averages

In [107]:
```
# Python Dependencies required to draw charts and calculate moving averages
import matplotlib.pyplot as plt
import pandas as pd
%matplotlib inline
```

A. Queries

Following queries were used to extract blobal and city data between years 1800 and 2013

1. This query extract global data from Udacity provide database

```
SELECT *
FROM global_data
WHERE year BETWEEN 1800 AND 2013;
```

2. Query bellow extracts data from Udacity provided database for city London UK

```
SELECT *
FROM city_data
WHERE city = 'London'
AND country = 'United Kingdom'
AND year BETWEEN 1800 AND 2013;
```

You can find queries in `queries.sql` file if you wish to exectute them by yourself

B. Data

City Data

In [72]:
```
## Loads city data
city_data = pd.read_csv("city_data.csv")

## Calculates moving averages for period of 10 years
city_data["moving_avg"] = city_data["avg_temp"].rolling(10, min_periods=1).mean()

## Shows first 5 rows
city_data.head(5)
```

Out[72]:

	year	city	country	avg_temp	moving_avg
0	1800	London	United Kingdom	9.32	9.320000
1	1801	London	United Kingdom	9.68	9.500000
2	1802	London	United Kingdom	9.31	9.436667
3	1803	London	United Kingdom	8.79	9.275000
4	1804	London	United Kingdom	9.37	9.294000

Global Data

In [73]:
```
## Loads global data
global_data = pd.read_csv("global_data.csv")

## Calculates moving averages for period of 10 years
global_data["moving_avg"] = global_data["avg_temp"].rolling(10, min_periods=1).mean()

## Shows first 5 rows
global_data.head(5)
```

Out[73]:

	year	avg_temp	moving_avg
0	1800	8.48	8.4800
1	1801	8.59	8.5350
2	1802	8.58	8.5500
3	1803	8.50	8.5375
4	1804	8.84	8.5980

C. Visualization

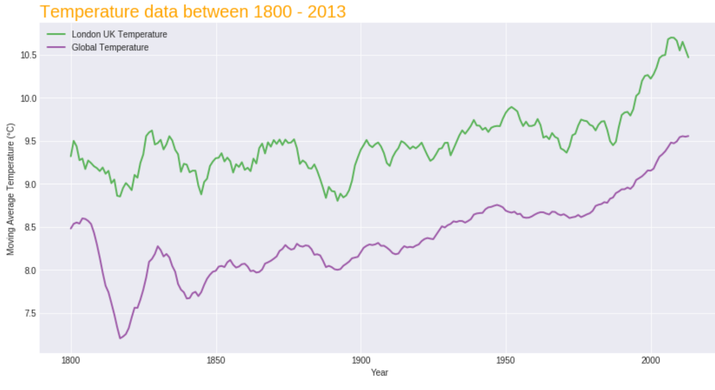
Draw data using matplotlib

In [106]:
```
## Set up chart
plt.style.use('seaborn-darkgrid')
palette = plt.get_cmap('Set1')
plt.figure(figsize=(14,7))

## Draws city and global data
plt.plot(city_data["year"], city_data["moving_avg"], marker='', color=palette(2), linewidth=2,
 alpha=0.9, label="London UK Temperature")
plt.plot(global_data["year"], global_data["moving_avg"], marker='', color=palette(3), linewidt
h=2, alpha=0.9, label="Global Temperature")

## Title and legends
plt.title("Temperature data between 1800 - 2013", loc='left', fontsize=20, fontweight=34, colo
r='orange')
plt.xlabel("Year")
plt.ylabel("Moving Average Temperature (°C)")
plt.legend()
```

Out[106]:
```
<matplotlib.legend.Legend at 0x7f511f1982b0>
```



D. Observations

1. The average local temperature is approximately 1-degree Celsius higher than global temperature
2. The hottest year in London UK between years 1800 and 2013 was 2011
3. The average global temperature has increased by approximately 1 degree from 1800 to 2013
4. The general trend of continuous increase in average temperature suggest that Earth is getting warmer