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Project: Explore Weather Trends

Steps taken to complete project:

- **First step was to extract the gloabal data from the Udacity workspace, using the SELECT and FROM queries, I selected all columns (*) from the global_data database.**

```
SELECT *
FROM global_data;
```

I exported my resulting database to be used in Excel

- **My next step was to select the city closest to me, I first obtained the city_list database using the same SELECT and FROM queries, and noticed rather than scrolling down to the United States, I added a WHERE query for the country column in 'United States", and was able to find the city closest to me was Philadelphia.**

```
SELECT *
FROM city_list
WHERE country = 'United States';
```

- **The city_data database was very large, so my intial step to obtain data for my city was to access the data only for Philadelphia, I again used the SELECT. FROM, and WHERE queries. Before exporting these results I noticed some values for the avg_temp were missing. The first solution I came up with was to add an AND query after filtering for city, I used avg_temp greater than zero.**

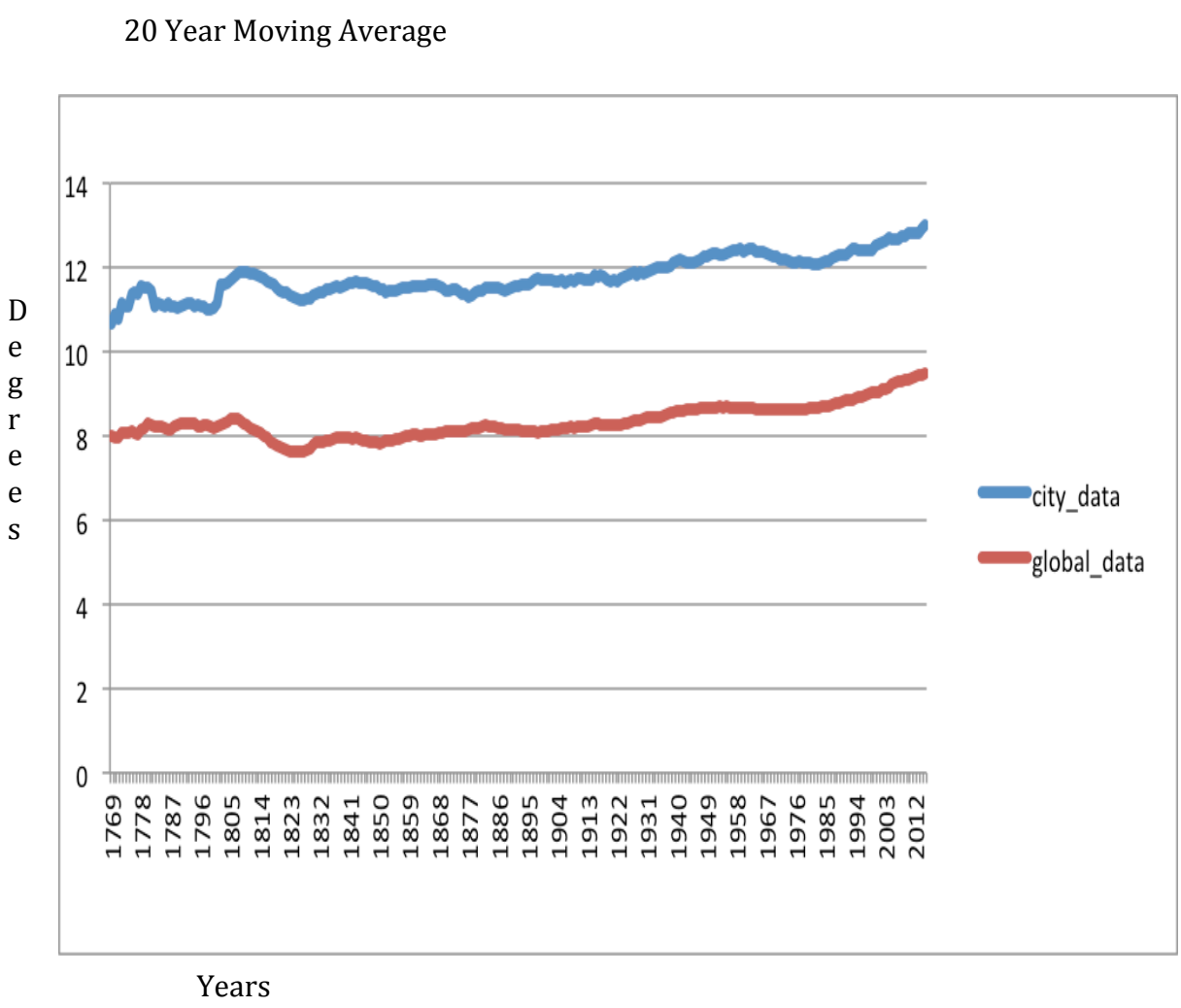
This solution worked to filter out the empty values for the avg_temp, however I realized if a city had avg_temp of zero or below zero in a certain year it would also remove those values. Upon doing some research I found the IS NULL query. I added the IS NOT NULL query in the position where I had greater than zero, and the result was the same as my original, however now allows for both zero and negative values. I again exported my results to use in Excel.

```
SELECT *
FROM city_data
WHERE city = 'Philadelphia' AND avg_temp IS NOT NULL;
```

- **I first opened the global_data database in excel, and calculated two moving averages, one of ten years moving average, and another for twenty years. I used the same method taught in the lesson, to take the sum of the first 10/20 values and divide by 10/20, and the drag down to the end of the column**
- **I used the same steps to calculate the moving average of the city of Philadelphia average temperature for both 10 and 20 year moving averages.**
- **Before comparing the city and global averages, I wanted to make sure my line chart would be smooth and just to see the trend of how both averages have changed over time. In both instances I created a line chart in Excel, and added**

the values of all of my calculated moving averages in separate charts.

- **I noticed firstly, that the 10 year moving average for Philadelphia, was not as smooth as I would like, so I decided to use the 20 year moving average for both global and city data.**
- **I also noticed that both averages were increasing as the years went by.**



Observations

- **The first observation I was able to quickly make was that the 20 year moving average for Philadelphia was higher than the global data.**
- **The second observation I was able to make was that in both global and city data, the there was a positive trend in average temperature.**
- **I recognized that the line chart created for the 10 year average had the same basic trend as the 20 year average, however the 20 year average is a much smoother line, and therefore decided to use the 20 year average.**
- **The city_data on average was around 2 degrees (C) higher than the global temperature.**
- **I also noticed that spikes in temperature were consistent with both the city and global data, in other words, years where there was an extreme shift in temperature (in either direction) for Philadelphia you could see the same shirt in temperature for global data. Therefore I can say that if in any particular year, Philadelphia was colder than expected, you could also expect that the rest of the world would have had a colder average temperature as well.**
- **I also noticed that the upward trend in both global and city temperature started to spike only recently, from 1920/1930 both averages were trending upward, as opposed to before**

1920/1930 the average temperatures were much more steady.

- **In conclusion we can see that Philadelphia is generally warmer than the rest of the world.**
- **There is an upward trend in my cities average temperature as well as the global tempature.**
- **The upward trend started more recently, around the 1920s or 30s.**
- **Both my local cities temperature and the global temperature, are effected in the same way, spikes in temperature in either direction are seen with both local Philadelphia average temperatures and global average temperatures.**