Hello classmates and professor Catlin. My name is Luis Hernandez Centti and my final project for the class compares how the NY state registered temperature can differ from the registered temperature on Manhattan’s area alone. To be able to show that I had to perform several weather calculations , creating new columns on tables, making temperature conversions and more, all these with the finality to have consistent data across my database. I worked with two tables on my database called “nyweather”, one table that holds the weather data from the whole NY state, and the other table that holds the weather data on the Manhattan area only. Both of these tables showing data only from May 2014 to September 2014. I will now briefly explain the calculations I did, from where the data was obtained, and how I formed and organized the tables.

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The first table I just called "data". I used the R studio airquality package as the data I started with, then I added a couple of columns to it. One of the new columns was the Wind Chill temperature, after that one I added the Real Feel temperature column. These two columns were required to be calculated In order to properly compare data across my database tables.

The mathematical operations I did followed scientific formulas to calculate weather variables:

\*Its import to note that the data on the airquality package on r its not really a NY data but I wanted to use it like it really was.

To find the real feel sensation formula first I needed to create a new variable called Wind-chill temperature. These 2 formulas for the Windicill temperature and the Real feel temperature are explained here:

Equation for Wind-chill:

T{wc}=13.12 + 0.6215 T\_a-11.37 V^{+0.16} + 0.3965 T\_a V^{+0.16}

Twc = Wind Chill Temperature, Ta = Atmospheric Temperature (F), and V = Air Speed (mph) (Source).

To calculate the Windchill temperature I needed to know the atmospheric temperature and the air speed, both of these were available from the original aiquality package, so I just used those.

If we wanted we could get accurate and hourly windchill temperature from this graph, by updating the required values onto the formula.



To calculate the apparent temperature or also called the Real feel temperature we used the following formula:

AT=T\_a+0.348e-0.70ws+0.70-4.25

Ta = Dry bulb temperature (°C) e = Water vapour pressure (hPa) [humidity] ws = Wind speed (m/s) at an elevation of 10 meters Q = Net radiation absorbed per unit area of body surface (w/m2)

After the new columns were created I cleaned the data to avoid nulls, to finally plotting them out to analyze the outcomes.

One final calculation I did with this first table was to convert all the temperature values from Fahrenheit to Celsius, this conversion gave place to have a new alternative table called “dataincelsius”(the same data as the table “data but on Celsius”. The temperature conversions along with the mathematical weather calculation were all done on R studio.

After I had my first table called “data” filled , I could focus on my second table “Manhattan”.

The data on the table Manhattan was fetched online thanks to the R package “weatherDATA” . This package work fetching weather data from various worldwide stations , it allows various personalization searches and fetching. For example I extracted the weather from the station called Manhattan, considering only the data from the months dates between 2014-05 to 2014-10. To achieve that I used the library(weatherDATA) with the following code assigned to the variable Manhattandata:

Manhattandata = getWeatherForDate(“MANHATTAN”, “2014-05-05”, “2014-10-05”)

Source:

<http://ram-n.github.io/weatherData/>

After the data was fetched into an R variable Manhattandata I cleaned it out from NAs. Then test it out on to plots to see again the outcomes for this particular second tablet “Manhattan”.

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After I was done with both tables, the next step was to export it all to .csv files , for later have it all import it to the database “nyweather” on postgresql.

The database I created on postgresql was called “nyweather” and as mentioned at the beginning of this presentation it have two main tables ,“data” and “Manhattan”, and also a third alternative table called “dataincelsius” that was just basically the same data on the table “data” but converted to Celsius.

After I populate my tables I was ready to do various basic and complex queries. All these queries are showed on detail on the folder for my final project on my github:

[www.github.com/luhercen/is360/finalproject](http://www.github.com/luhercen/is360/finalproject)