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DATA1201 Final Exam
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Topic: Cycling Activity and the weather

Question: How does weather (specifically temperature) impact the riding activity for the day?

My scientific goal for this project was to better understand the relationship between the weather and people who choose to go on bike rides. I narrowed down my scope from overall weather to a more temperature specific relationship. My initial question was “How does the level of precipitation affect the riding times for the day?”. However, I soon realized that the data set I got from kaggle was better suited to looking at the number of rides a day related to temperature, not the level of precipitation, since the precipitation column of the data didn’t have much data to work with. For this project, I decided to try and see if the temperature for the day did indeed have an effect on the level of riding activity for the day, as I hypothesized.

Getting the Data

In order to answer my research question, I needed the dates, the temperatures for each day, and the number of bike rentals associated with each day. I looked at the 3 csv files I got from kaggle: Nice_ride_trip_history_2017_season.csv, WeatherDailyMinneapolis2017.csv, and Nice_Ride_2017_Station_Locations.csv. I decided that I wouldn’t need the third one, so I deleted that and then opened the other two files to look at what data they offered.

Nice_ride_trip_history_2017_season.csv had several columns: Start date, Start station, Start station ID, End date, End station, End station ID, Account type, and Total duration (seconds). Based on the data I needed, I decided to get rid of all of the columns except for Start date and Total duration (seconds). The reason I didn’t include End date was because that would’ve made the data more difficult, and it was easier to have Start date rather than End date because they were already in order of start date.

WeatherDailyMinneapolis2017.csv had columns for Station, Name, Date, Precipitation, and TMAX and TMIN, which were the temperature highs and lows for the day. I got rid of Station, Name, and precipitation because they weren’t what I needed, and renamed TMAX and TMIN to High and Low to make it easier to figure out what they were.

Then I went through each date in Nice_ride_trip_history_2017_season.csv from April 3 to October 3, and took the number of rides for each day and added that as a column named Rides to WeatherDailyMinneapolis2017.csv.

Ethics-wise, individuals cannot be identified through this data set, and the data is publicly available through the nonprofit organization of Nice Ride MN. However, it is important to recognize that there may be biases in my data since I only used a subset of the data given to me, instead of using all the days. There may also be biases related to socioeconomic status, as it is a bike rental company, which means that those who use the bikes are those who can afford it, and not just anyone who wants to go ride a bike.

Exploring the Data

Some other questions that may be answered by the data include: What is the relationship between precipitation level and riding activity?, as I mentioned earlier, What is the time needed to bike between different areas of Minneapolis?, or How likely is it that a person with a membership to the company uses the bikes?

Results/Data Visualization

The results of my data find that temperature does in fact influence the level of riding activity for any given day of the year, although there seems to be a lower number of bike rentals for holidays such as Memorial Day and Fourth of July. This result aligns with my earlier hypothesis that there is a relationship between the temperature for the day and number of bike rentals.

Conclusion

In conclusion, the data proves my point that riding activity correlates with the average temperature for the day. One possible use for this data and resulting conclusion would be for other bike rental companies so they can predict the level of activity for the upcoming days or weeks, and then put out less or more bikes so that the bikes are not damaged by weather or not in danger of being stolen.