Toronto Bike Share (Part 2)

Background

Toronto Bike Share (TBS) wants to revamp their product offering. Before they take action, TBS needs to know how customers are using their product. An opportunity they could create is a new pricing models for members and non-members based on current usage patterns - surge pricing by time of day, day of week and location, faster replenishment. Please refer to objectives and deliverables for more detail on what is to be expected from this assignment

Business Inquiries

- Most popular days of the week by month, quarter.
- Average ride time per day of the week? Month?
- Average daily trips per month
- Popular start and end stations
- Total usage/mileage/time among user profile groups
- Insights into the most popular routes
- Observe and report on the effect of the user base over the year. Can you make projects for this into the next year?

Monetization

Overage - charge $4 for every 30 min you are over

Types of overage:
Type 1 0-30 minutes
Type 2 31-60 minutes
Type 3 61-90 minutes
Type 4 91-120 minutes
Type 5 120+ minutes

- Total overage trips
- Show by type and member/non-member

Bike share pricing - https://bikesharetoronto.com/pricing/

Objective/Deliverable

Your goal when working with TBS in this 2nd part of this project:

1) Using your newfound knowledge of groupby, resample, and aggr functions, create views (tables) for each of these key business queries

2) Using techniques you've learned, create a small high-level report on your findings from analysing these business questions and include them in a power point/google slides presentation.
    a) Have appropriate, business professional headings and logical flow for your slides
    b) You don't have to have a lot of slides. Have data visualizations, reports (trends, patterns, etc), and insights from your analysis for the TBS business

Criteria for Completeness

Technical Tasks to be Completed

- To communicate appropriate meaningful results and trends in your data, decorate your data visualizations with the appropriate axis labels, axes limits, legends, coloring, sizing, layout. This can be in the form of a barchart or other type of plot that you deem appropriate. Do this using:
    - 2 plots in matplotlib
    - 2 plots in seaborn
    - **BONUS:** 2 plots in plotly/bokeh/chartify
- Use 3 user-defined functions to answer 3 of those key business questions
- To answer the question, apply the appropriate aggregate statistics + any other type of statistic that would be deemed appropriate and important to include in a view/report
- Sub-profile user groups into usage categories. These are arbitrary and up to you.
- Create 1 or 2 SQL like tables from your larger main dataframe to simulate a SQL like table you might encounter in the wilderness

Analytical Tasks to be Completed:

- Make suggestions to TBS on what profile groups to target for their promotional plans
- Identify surge usage times and identify a possible strategy that TBS might do to offer users more out of their membership
- At least 3 interesting observations about the dataset

Styling and Presentation:

- Your google slides/power point presentation should be business-appropriately formatted, styled, and have logical flow of ideas
- Your jupyter/colab notebook should have comments, remarks and insights to document your work and thought processes. It should also have the appropriate headings (background, problem, questions, loading, … suggestions).

Deadline:

- Presentation:
    - Hand-in: 22-04-2020
- Notebook:
    - Hand-in: 22-04-2020