Ira A. Fulton Schools of Engineering
Arizona State University

CSE 578: Data Visualization

Programming Assignment 2 - Graphing Dino Fun World

Assignment Description

Impressed by your previous work, the administrators of Dino Fun World have asked you to create some charts that they can use in their next presentation to upper management. The data used for this assignment will be the same as the data used for the previous assignment.

The administrators would like you to create four graphs:

Chart 1: A pie chart depicting visits to thrill ride attractions.

Chart 2: A bar chart depicting total visits to food stalls.

- Please query attractions with Category equal to "Food".

Chart 3: A line chart depicting attendance at the newest ride, Atmosfear over the course of the day.

- For this question, use data from the table "sequences". You can assume that all activity sequences are aligned by time (i.e., the first node of all sequences occurred at the same time) and are of the same length.
- You only need to consider the first 16 hours of records in the sequences, which is considered the open hours of the park in one day. Specifically, because an activity sequence from the "sequences" table was updated/recorded every 5 minutes, you need to extract the first 192 items (16h * 60m / 5m = 192).
- Your data list (which will be printed) must be in the format of tuple list (or list of lists). The first item in tuples is irrelevant, but you can put in some meaningful information. The second item is the count of visits at that moment. For example, your output should look like this (in Python syntax; not relevant to the correct answer): [(0, 0), (1, 7), (2, 3), …, (190, 4), (191, 5)].

Chart 4: A box-and-whisker plot depicting total visits to the park's Kiddie Rides.

- The to-be-printed, the data list must be ordered by AttractionID (a field in the table "attraction").

Directions

The database provided by the park administration is formatted to be readable by any SQL database library. The course staff recommends the sqlite3 library. The database contains three tables, named 'checkin', 'attractions', and 'sequences'. The database file is named 'dinofunworld.db' and is available in the read only directory of the Jupyter Notebook environment (i.e., readonly/dinofunworld.db). It can also be accessed by selecting File > Open > readonly/dinofunworld.db.

The information contained in each of these tables is listed below:

`checkin`:

- The check-in data for all visitors for the day in the park. The data includes two types of check-ins: inferred and actual checkins.
- Fields: visitorID, timestamp, attraction, duration, type

`attraction`:

- The attractions in the park by their corresponding AttractionID, Name, Region, Category, and type. Regions are from the VAST Challenge map such as Coaster Alley, Tundra Land, etc. Categories include Thrill rides, Kiddie Rides, etc. Type is broken into Outdoor Coaster, Other Ride, Carousel, etc.
- Fields: AttractionID, Name, Region, Category, type

`sequences`:

- The check-in sequences of visitors. These sequences list the position of each visitor to the park every five minutes. If the visitor has not entered the part yet, the sequence has a value of 0 for that time interval. If the visitor is in the park, the sequence lists the attraction they have most recently checked in to until they check in to a new one or leave the park.
- Fields: visitorID, sequence

Using the provided data, create the four visualizations that the administration requested: the pie chart, bar chart, line chart, and box-and-whisker plot.

Technical Requirements

If you choose to work on your assignment locally, you can use the following versions:

- Python 3.6
- Sqlite3

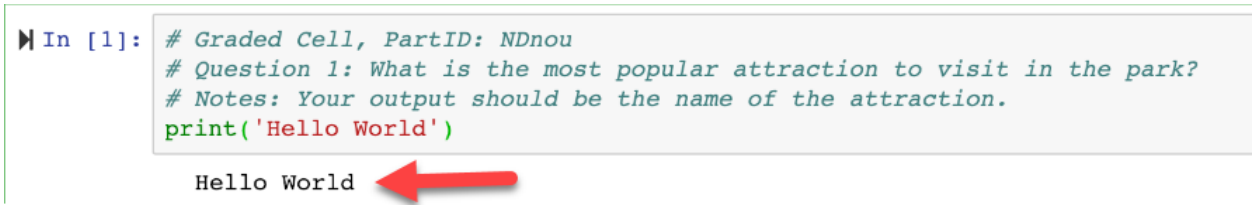
- Pandas == 0.23.3
- Matplotlib == 2.2.2
- Numpy == 1.13.3

Submission Directions for Assignment Deliverables

This assignment will be auto-graded. We recommend that you use Jupyter Notebook in your browser to complete and submit this assignment. In order for your answers to be correctly registered in the system, you must place the code for your answers in the cell indicated for each question. In addition, you should submit the assignment with the output of the code in the cell's display area. The display area should contain only your answer to the question with no extraneous information, or else the answer may not be picked up correctly.

Each cell that is going to be graded has a set of comment lines at the beginning of the cell. These lines are extremely important and must not be modified or removed. (Graded Cell and PartID comments must be in the same line for proper execution of code.)

Please execute each cell in Jupyter Notebook before submitting.



Evaluation

There are four parts in the grading, and each part has one test case where the total number of points for all parts is 40. If some part of your data is incorrect, you will get a partial score of 3 or 5. If the submission fails, we will return the corresponding error messages. If the submission is correct, you will see "The data used for the chart is correct" with 10 points for each part.