Description of the input used in the numerical experiment of the paper:

A 3-Step Math Heuristic for the Static Repositioning Problem in Bike-Sharing Systems

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In this document we describe the input used for the numerical experiment in Section 5 of the paper. The data is stored in comma delimited text files (csv) and can be viewed in Microsoft excel.

The input is the complete data set for the 200 stations instances. The smaller instances were constructed from subsets of this data set. E.g., an instance with n stations refers to the data of the first n stations in the files.

Four sets of parameters are included, each in a separate file:
1. Distance matrix (distances.csv). The entry in the jth column of the ith row refers to the traveling time in seconds from station i to station j.
2. Capacity of the stations (capacities.csv). Each entry contains the capacity of the corresponding station.
3. Initial inventory for the three load levels discussed in the paper (light.csv, real.csv, heavy.csv). Each entry contains the initial inventory in the corresponding station before the repositioning is commenced.
4. Penalty functions (penalties.csv). The entries of each row describe the penalty function of the corresponding station. E.g., the jth column of the ith row refer to $f_i(j-1)$, starting with $f_i(0)$ at the first column. Clearly only the first $c_i + 1$ entries are meaningful and the rest of the columns are padded with zeros to allow the rectangular structure of csv files, given the fact that capacities are not identical for all the stations in the system.