Data Practice Instructions

Finance and Business Information Services

University of Iowa

# Background

# The University of Iowa's Parking and Transportation Department issues access cards for employees and students to use gated parking lots. Each card has one or multiple access groups assigned to it, and each access group is granted the privilege to get in and out of certain parking lots.

# Data Provided

You are given two CSV files, CardAccessGroupAssignment and CardTransaction.

* The CardAccessGroupAssignment file lists access cards in the system with the AccessGroup(s) they are assigned to. When a user tries to use a card at a gate, the system checks if it has any AccessGroup assigned to it that has the right to access the lot according to the Priority order. If so, the gate is raised.
* The CardTransaction file contains access card transactions between January 1, 2021 and April 30, 2025. It has the following fields.
  + TransactionId: the unique identifier of the transaction.
  + CardNumber: the card being used.
  + LotNumber: the parking lot where the card is used.
  + NoEntry: 1 if the transaction does not record an entry, 0 otherwise.
  + NoExit: 1 if the transaction does not record an exit, 0 otherwise.
  + Overnight: 1 if the transaction crosses midnight, 0 otherwise.
  + EntranceTime: the time the card is used to enter the parking lot.
  + ExitTime: the time the card is used to exit the parking lot.
  + EffectiveGroupNumber: The AccessGroup Number assigned to the card that granted access to the parking lot.

# Deliverables to Implement

* Please produce an interactive report to help departmental administrators understand the parking patterns of card users, especially peak usage, to assist in the decision-making of issuing new cards with various access groups. You are encouraged to use creative visualization to present the report.
* With the identified patterns, try to forecast the peak usage in each parking lot in the remaining months of 2025.

# Notes

* All data provided is University of Iowa internal institutional information and should not be disclosed to any other party without approval from the organization in advance.
* Some cards were added to the system in this period and may not have transactions in the earlier years and months. Some cards were assigned additional access group(s), which might cause changes to their parking patterns.
* We consider the usage of space as the timespan between the EntranceTime and the ExitTime of a CardTransaction.
  + When a transaction does not have an EntranceTime, we may conveniently assume it entered the lot at midnight before the ExitTime.
  + Similarly, when a transaction does not have an ExitTime, we may conveniently assume it exited the lot at midnight after the EntranceTime.
* We consider the peak period as the time period when the simultaneous usage of a certain lot reaches the highest level of the day, week, and month, and the peak usage as that maximum simultaneous usage count.
* Due to the size and format of the data sets, you may want to avoid using Excel to load them.
* Please feel free to use any publicly available software/tools and note what is used, though Power BI is our platform of preference.
* If you have general questions on Parking procedures and rules, you may find the ChatBot at the lower right corner of <https://transportation.uiowa.edu/> helpful.
* Feel free to include any public information, such as academic calendar, events, and weather, that may help implement the solutions.