# OPTIMAL PATH FOR OVERNIGHT REBALANCING OF A MODEL CITI BIKE STATION CLUSTER

MONICA ABDALLAH CHE'17
KRISTIANA KAVO CHE'17
ADVISOR: PROF. BENJAMIN DAVIS

To ensure smooth operation of the Citi Bike service during the morning rush hour, trucks are used to shuffle the bikes overnight from stations known to overflow to those known to struggle to meet the demand for bikes.

In this project, we aim to determine the optimal path of the truck that completely rebalances a model system of four stations. This optimization problem was formulated as an integer non-linear programming problem with binary decision variables, which correspond to the possible paths between the stations. A semi-brute force algorithm that enumerates all the candidate solutions and checks each candidate against the problem constraints was used to determine the optimal truck route.
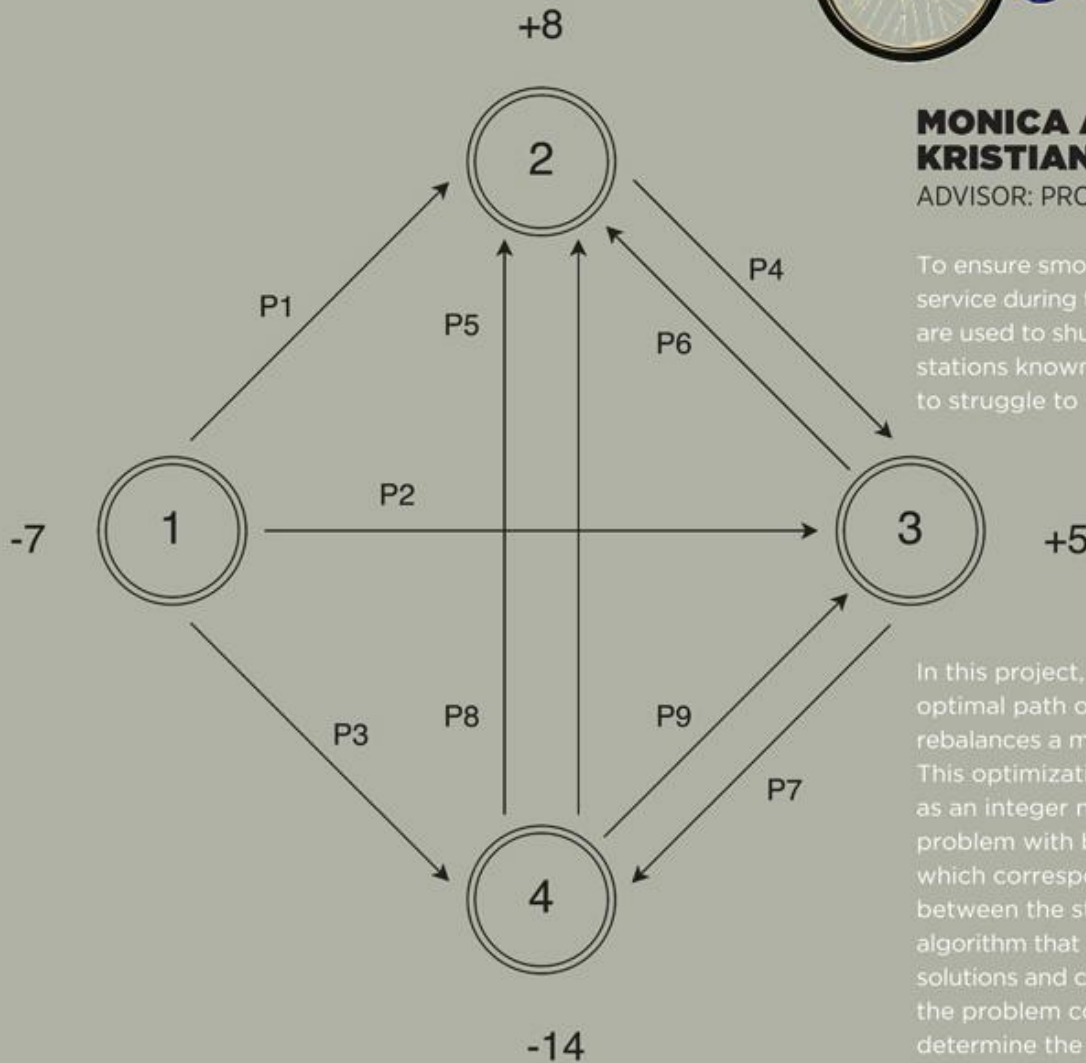
Legend:
- ◎ Citi Bike dock
- → truck path