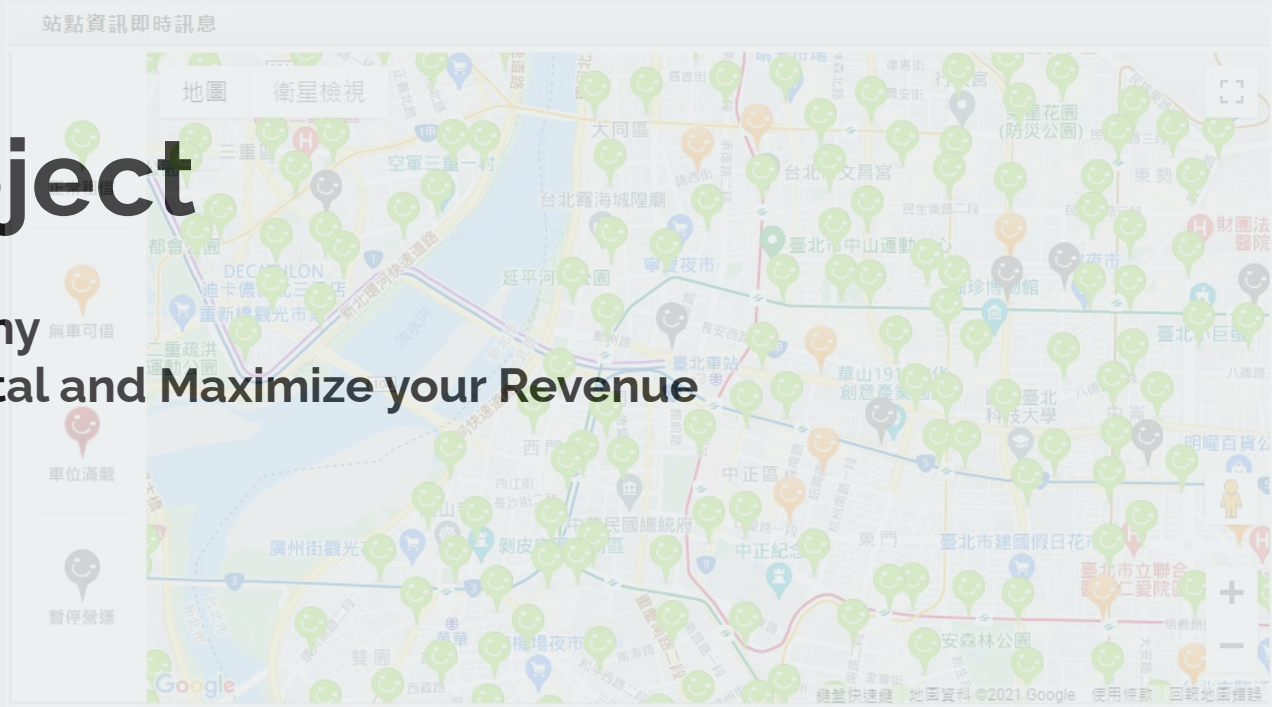
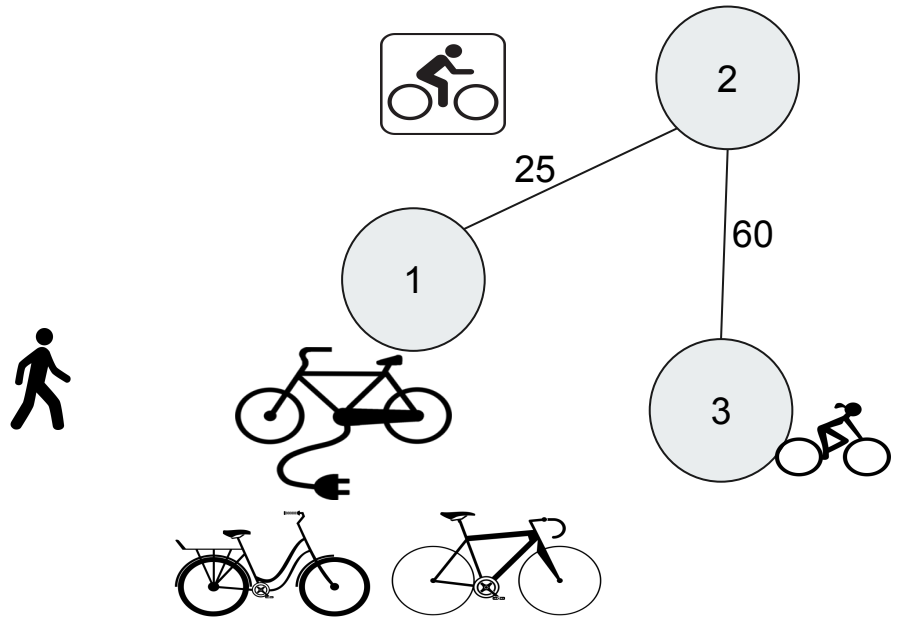
Final Project

NTHU Bike Company
- Manage Bike Rental and Maximize your Revenue

2021 Fall,
Data Structure



Introduction (with simplified examples and inputs)



Input

- map.txt

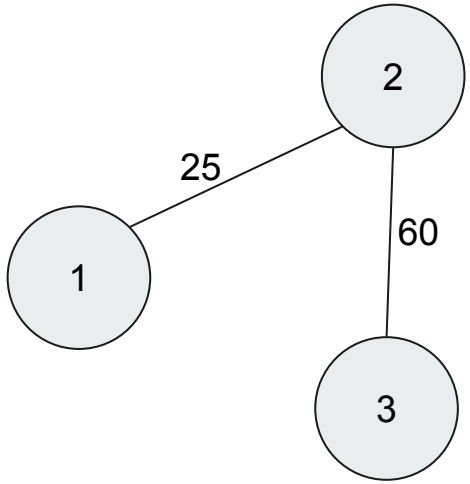
  station1 station2 distance

  1. 1 2 25
  2. 2 3 60

- station.txt

  station_id electric lady road

  1. 1 6 3 4
  2. 2 30 100 9
  3. 3 0 10 10



station_id 1

electric	lady	road
100	100	100
101	101	101
102	102	102
103		103
104		
105		

station_id 2

electric	lady	road
200	200	200
201	201	201
202	202	202
…	…	…
229	299	208

Input

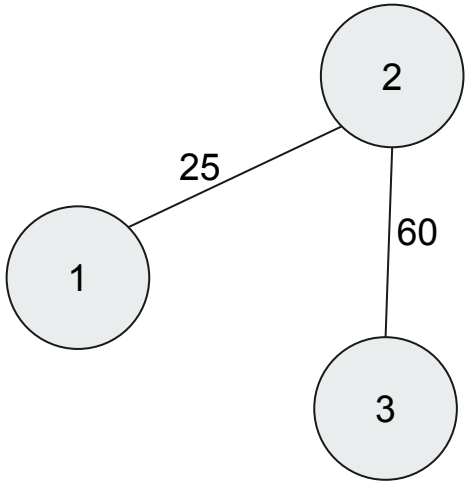
- fee.txt
  1. electric 30 40
  2. lady 25 35
  3. road 15 25
  4. 5 // rate of waiting fee
  5. 0.2 // the discount rate for switching bike type
  6. 6 // rate of transferring fee

Input

- user.txt

  rent stationIdRent bikeType userId timeRent

  return stationIdReturn userId timeReturn



1. rent 3 lady 00002 **0**
2. rent 2 electric 00001 0
3. return 1 00001 35
4. return 1 00002 85
5. rent 3 electric 00003 90
6. return 1 00003 **1440 //1440 = Closing Time (of a day time interval: 0~1440)**

Output (display final location of each bike (at some station), and total revenue)

part1_status.txt

1. 1: //station_id
2. electric: 100 101 102 103 104 105 200
3. lady: 100 101 102 300
4. road: 100 101 102 103
5. 2:
6. ……
7. 3:
8. ……
9. 3525 //Total revenue you make

Output (display your policy in response to each rental request)

part1_response.txt

1. rent 3 lady 00002 0
2. **accept**
3. rent 2 electric 00001 0
4. **accept**
5. return 1 00001 35
6. return 1 00002 85
7. rent 3 electric 00003 90
8. **reject**
9. return 1 00003 1440

- Display your policy
  - accept
  - reject
  - ~~wait~~
  - ~~discount *tp*~~
  - ~~transfer sj si *tp* number time~~

- Only accept/reject would be your responses in part1

Output (display your policy in response to each rental request)

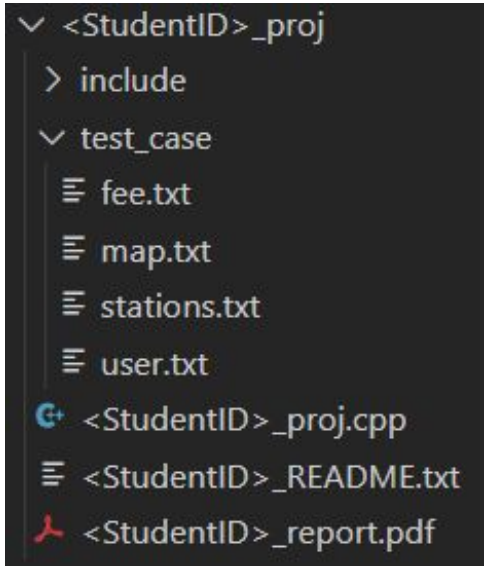
part2_response.txt

1. rent 3 lady 00002 0
2. **accept**
3. rent 2 electric 00001 0
4. **accept**
5. **transfer 2 3 electric 1 10**
6. return 1 00001 35
7. return 1 00002 85
8. rent 3 electric 00003 90
9. **accept**
10. return 1 00003 1440

- fee.txt
  1. electric 30 40
  2. lady 25 35
  3. road 15 25
  4. 5 // rate of waiting fee
  5. 0.2 // the discount rate for switching bike type
  6. 6 // rate of transferring fee
- Display your policy
  - accept
  - reject
  - wait
  - discount *tp*
  - transfer sj si *tp* number time
- Maximize your revenue by leveraging different choice of responses and the corresponding cost

Submission (what files shoule be inside <StudentID>_proj.zip)

- Directory structure
  - <StudentID>_proj/
    - ↳ include/
    - ↳ test_case/
      - ↳ fee.txt
      - ↳ map.txt
      - ↳ station.txt
      - ↳ user.txt
    - ↳ <StudentID>_proj.cpp



- Report:(10%)
  - <StudentID>_report.pdf
  - (Optional) <StudentID>_README.txt

Command

- Compiling command:
  - g++ -g *.cpp ./include/*.cpp -o <StudentID>_proj -std=c++11

- Execution command:
  “./<StudentID>_proj”

Environment

- OS: Ubuntu 20.04
- Setup: Tutorial

Q & A