South African Taxi Ranks: The Prediction of Incoming Passengers Through Data Analysis.

Presentation Objectives

- **South African taxi industry and its drawbacks**

- **Application of program architecture and application of CS 106 to design software solution**

- **Addressing solution loopholes**

US taxis

South African Taxis

South African Taxis

More than 200 thousand taxis located at taxi ranks

Roughly 15 million passengers everyday

Taxis only use specific routes outlined in a document pasted on each taxi rank

Industry is worth 1.2 billion dollars

Passenger names recorded on a book before departure for safety reasons

Problem Statement

South African Commuters who use public transportation need a way to have some control of their time because as things stand, they can only hope that a taxi fills up and leaves for their destinations.

Implementing Program architecture to design software solution

1. User story
2. Actions performed by application
3. Potential objects and classes

User story

A South African citizen who uses the public taxis wants to know if there is an available taxi at the taxi rank, the number of passengers in it, and the time it will leave for their desired destination. The user needs to know this information to decide if they should go to the taxi rank, and how soon they need to get there in order to find the available taxi.

Potential Methods and Functions

- Find the nearest taxi rank or the one desired by user: Google maps Application Program Interface (API)

- Allow user to check how soon the taxi will leave, if it is available

  ○ Find the taxi leaving for destination desired by user and the number of people in it: Numpy csv file reading

- Allow user to "hail taxi" once they have decided to go: csv file writing

- Allow user to check how soon the taxi would be leaving once they are on it at the taxi rank.

  ○ Find the number of potential passenger (others who have also "hailed" the taxi): csv file writing

  ○ Find location of all potential passengers: Google maps API

  ○ Calculate how long it will take for potential passengers to get to taxi rank

Potential Objects and Classes

The taxi rank which the user wants to go to or the nearest taxi rank.

The number of potential passengers who also require above mentioned taxi.

The taxi leaving for user's desired destination.

The user.

The number of passengers already in the above mentioned taxi.

Pencil?

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Addressing Solution Loopholes

- Diffusion of responsibility
  - " A sociopsychological event in which the presence of others makes it less likely for those present to take responsibility for the situation at hand."
    - Bystander effect
      - When the presence of more witnesses to a crime, accident, or other event decreases the chances of any one of these witnesses coming forward to help the person or persons in distress."

- Users might decide not to go to taxi rank if they see that there is only one passenger at the time.

  - Diffusing the responsibility of a somewhat full taxi to other people

Sources

Spall, B. (n.d.). *How diffusion of Responsibility Alters Group behavior.* Benjamin Spall · Writer. Retrieved May 3, 2022, from https://benjaminspall.com/diffusion-of-responsibility/

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