APPLIED DATA SCIENCE CAPSTONE PROJECT
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DATA SCIENCE CASE STUDY
RECOMMENDING NEW LOCATIONS FOR VELIB' STATIONS IN PARIS

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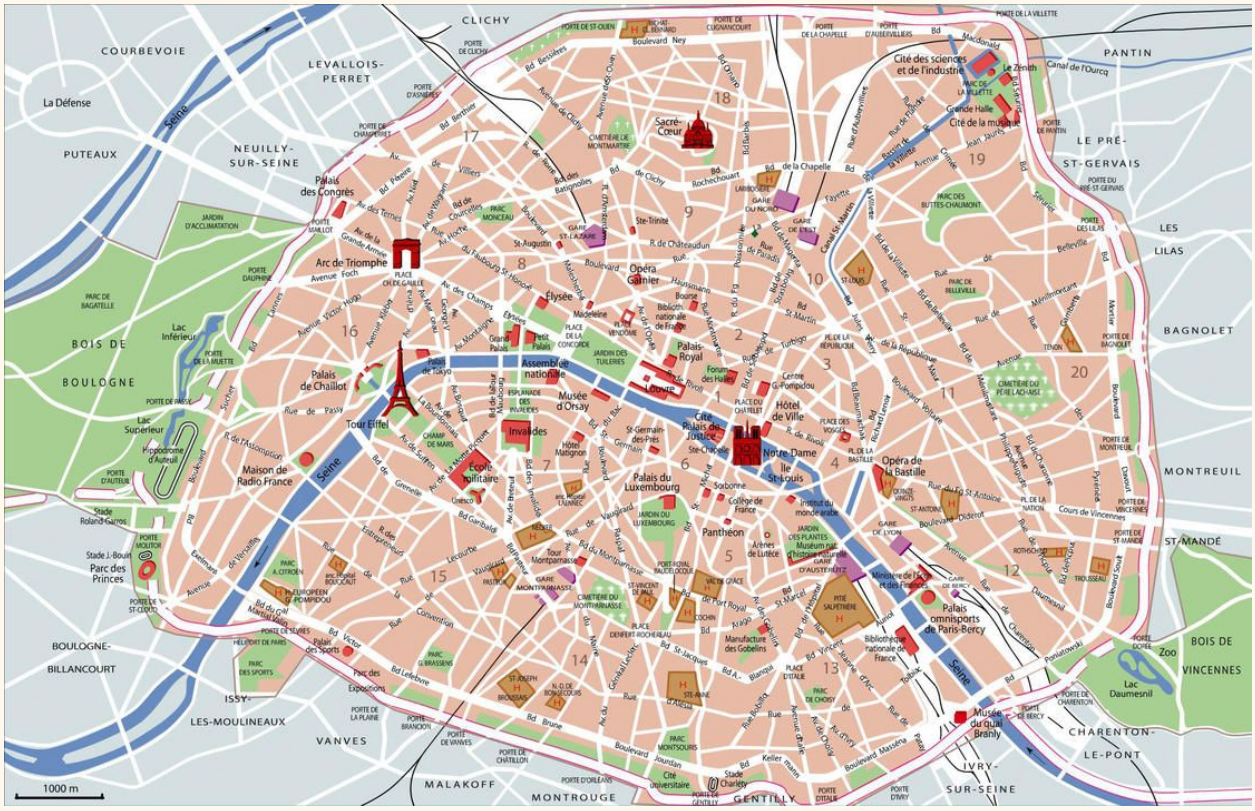

INTRODUCTION

Vélib' is a large-scale bicycle sharing system in Paris.

Launched in July 2007, it was wildly successful and set a great example for the rest of the world to follow. It is now the largest bike share outside of China, with around 20,000 bikes spread over 1,200 stations, and a daily ridership of about 86,000 people.

The name *Vélib'* is a portmanteau of the French words *vélo* ("bicycle") and *liberté* ("freedom"). The service aims to further the development of new forms of travel across the region that operate alongside existing transport options, especially polluting ones.

Beyond operating a good service, the most important aspect of the operation is choosing where to place the stations where people can hire and return the bikes, in order to maximise the chances that they will choose this type of transport.

The Paris Mayor has received a budget for 10 new stations to place in the city in 2019. His aim is to reduce areas that are commercially dense but don't have a nearby station. He has asked for a recommendation of areas to target.

DATA DESCRIPTION

1. Paris boroughs

A geojson file of shape (20, 12), published in 2013.
Downloaded from the official Paris database.

Each row contains a borough's following attributes:

1. **N_SQ_AR** Sequential ID
2. **C_AR** Number
3. **C_ARINSEE** INSEE Number
4. **L_AR** Name
5. **L_AROFF** Official Name
6. **N_SQ_CO** Sequential Code
7. **SURFACE** Surface
8. **PERIMETRE** Perimeter
9. **Geometry X Y** Coordinates
10. **Geometry** Complex coordinates
11. **OBJECTID** Object ID
12. **LONGUEUR** Length

2. Vélib' stations

A geojson file of shape (1221, 6), published in 2019.
Downloaded from the official Paris database.

Each row contains a station's following attributes:

1. **Identifiant de la station** ID
2. **Nom de la station** Name
3. **Capacité de la station** Capacity
4. **Lattitude** Latitude
5. **Longitude** Longitude
6. **Coordonnées géo[...]** Coordinates

3. Google Geocoding API

Used to get an address from coordinates (reverse geocoding).
Full documentation available here.

Required parameters for request:

1. **latlng** Latitude and longitude
2. **key** Application API key

JSON response:

1. **types[]** Type of result
2. **formatted_address** Postal address
3. **address_components[]** Separate components
    - 3.1. **types[]** Type of component
    - 3.2. **long_name** Full text description
    - 3.3. **short_name** Abbreviated textual name
4. **geometry** Latitude and longitude
5. **place_id** Unique ID

4. Foursquare Places API

Used to get nearby venues from coordinates. Full documentation available here.

Required parameters for request:

1. **ll** Latitude and longitude OR **near** String of a place in the world

JSON response:

1. **id** Unique ID
2. **name** Best known name
3. **location** Separate components
    - 3.1. **address** Address
    - 3.2. **city** City
    - 3.3. **state** State
    - 3.4. **postalCode** Postcode
    - 3.5. **country** Country
    - 3.6. **lat** Latitude
    - 3.7. **lng** Longitude
    - 3.8. **distance** Distance
4. **categories** Categories