ChicagoSocialHub
Real-Time Web-App

Project Overview Statement:

In this project we will design and implement a web-based real-time application for Divvy bikers that will allow them to search and chart Yelp reviewed Chicago social places (restaurants, bars, coffee shops, etc) and plot real-time available docks in near-by Divvy docking stations on Chicago downtown area map; we will call our application **ChicagoSocialHub**. The following sections document the technologies, data sources, and the detailed requirements

Technologies and Platforms:

The following is the list of technologies, platforms, and packages used in the design and development of the **ChicagoSocialHub** real-time app

1. Angular 14 or higher
2. Node.js/Express (16.20)
3. D3.js
4. Google Maps (AGM)
5. PostgreSQL (14 or 15) – to store Divvy stations real-time status
6. ElasticSearch (7.14) – to store Yelp reviews for Chicago Businesses
7. ElasticSearch (7.14) – to create and store Divvy real-time logs and store Divvy trips anonymized data
8. Chrome browser that is compliant with ECMAScript 2015 scripting 2015, (ES6): https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Classes. List of browsers/platforms that support ES6 can be found under ***modern browsers*** link on this URL: https://developer.mozilla.org/en-US/docs/Web/JavaScript

Data Sources:

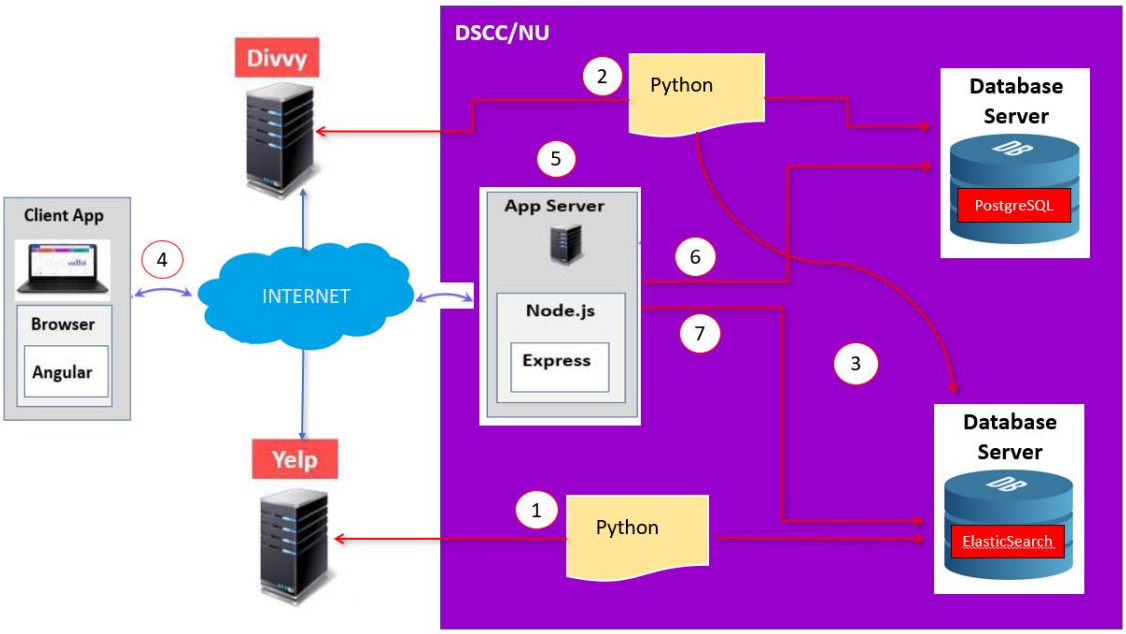
For this project there are two data sources that we will use for our application:

1. We will use **Yelp** business reviews (See Appendix A) to make recommendations for restaurants in Chicago downtown area that are highly reviewed and got at least 3-stars on **Yelp**.
    a. Here is the URL for Yelp API: https://docs.developer.yelp.com/docs/fusion-intro
    b. Here is the URL for businesses search: https://docs.developer.yelp.com/reference/v3_business_search
    c. Here is the URL for the supported search categories: https://docs.developer.yelp.com/reference/v3_all_categories

2. We will use **Divvy** real-time data (See Appendix B) about the status of their docking stations
    a. Here is the URL for the real-time data they publish: https://gbfs.divvybikes.com/gbfs/gbfs.json
    b. Here is the URL for the real-time status for the docking stations: https://gbfs.divvybikes.com/gbfs/en/station_status.json
    c. Here is the URL for the information for the docking stations: https://gbfs.divvybikes.com/gbfs/en/station_information.json
    d. Here is the URL for the anonymized data for Divvy trips: https://www.divvybikes.com/system-data

Architecture and High-Level Design:

The **ChicagoSocialHub** real-time web-app has the architecture detailed in the following diagram. Python scripts pulls data from Yelp and Divvy and store the data on PostgreSQL server and ElasticSearch server. Node/js/Express server receives requests from Angular clients and access the database servers to collect data and send the data back to Angular clients.



Requirements specification:

You will design and develop a web-based real-time application that meets the following requirements:

1. Develop the infrastructure for the **ChicagoSocialHub** realt-ime web-app utilizing **Yelp** and **Divvy** APIs.

2. Use Node.js/Express to create the back-end application server

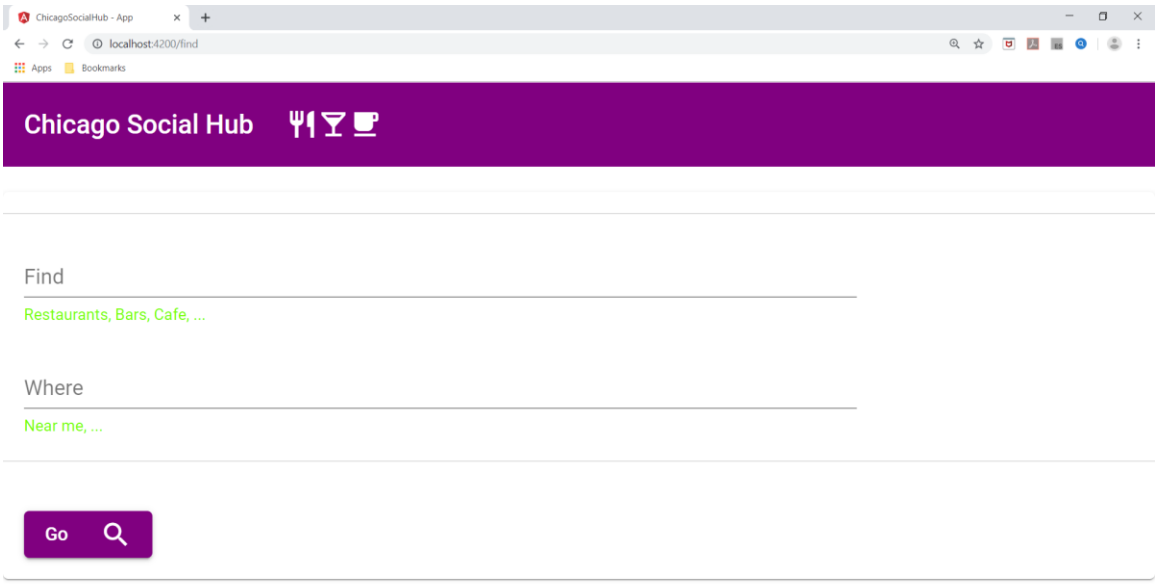
3. Use PostgreSQL and ElasticSearch for SQL and NoSQL databases to retrieve data

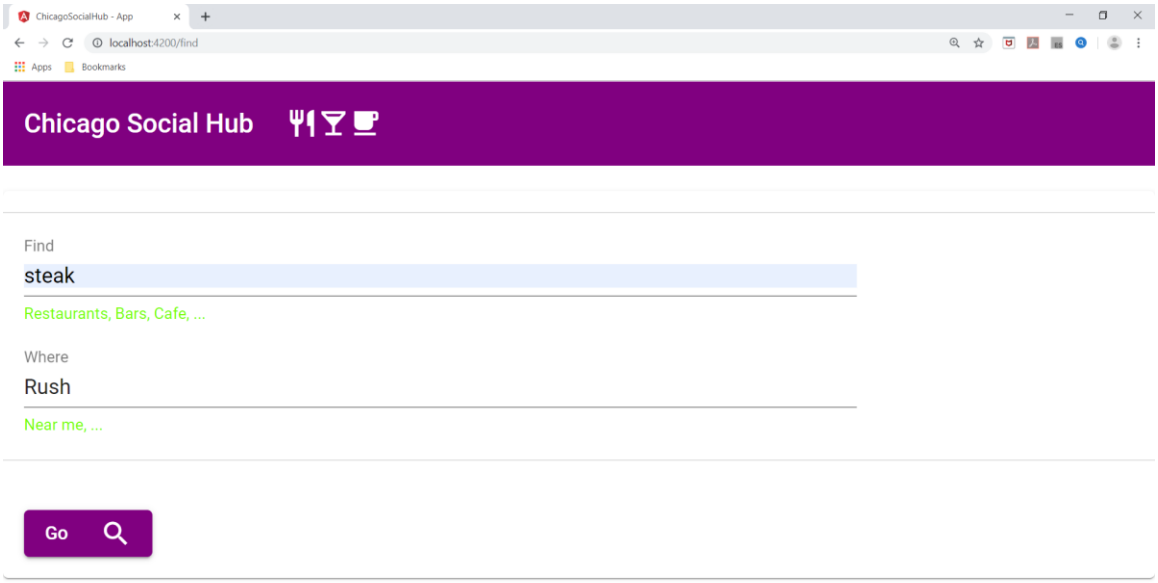
4. Use Google Maps to plot data for the Geospatial queries

5. Divvy bikers would like to search for places located on certain streets in Chicago downtown area and plot divvy nearest docking stations for a selected place on Google Map for Chicago downtown area.

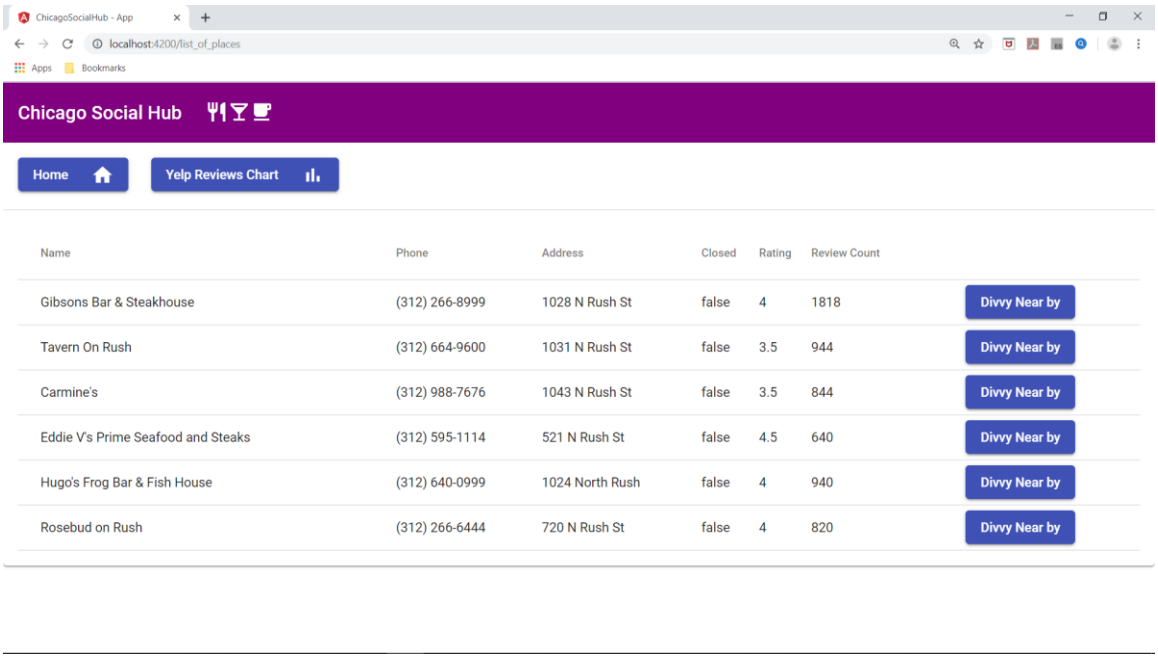
6. Use Angular to create the front-end (client-side) application

7. The app-user shall be able to specify the search conditions using two fields to represent the pair (business-category, street-name), for example, Italian on Wabash, steak on Rush, pizza on Michigan, etc. Your web-page shall look as follows:

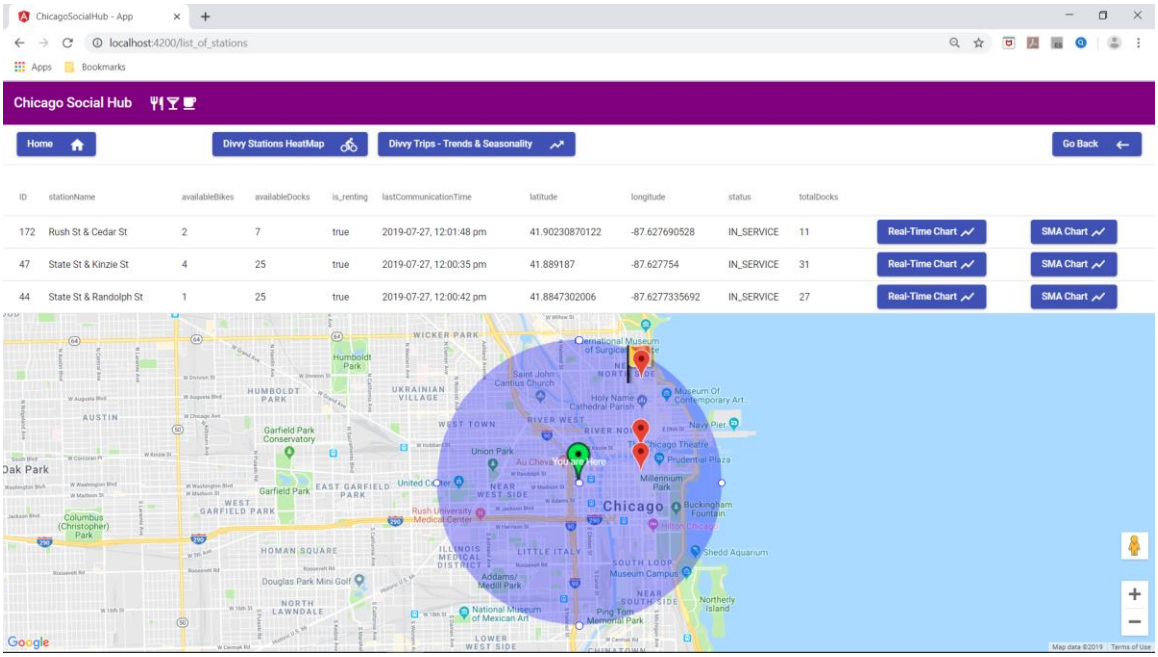




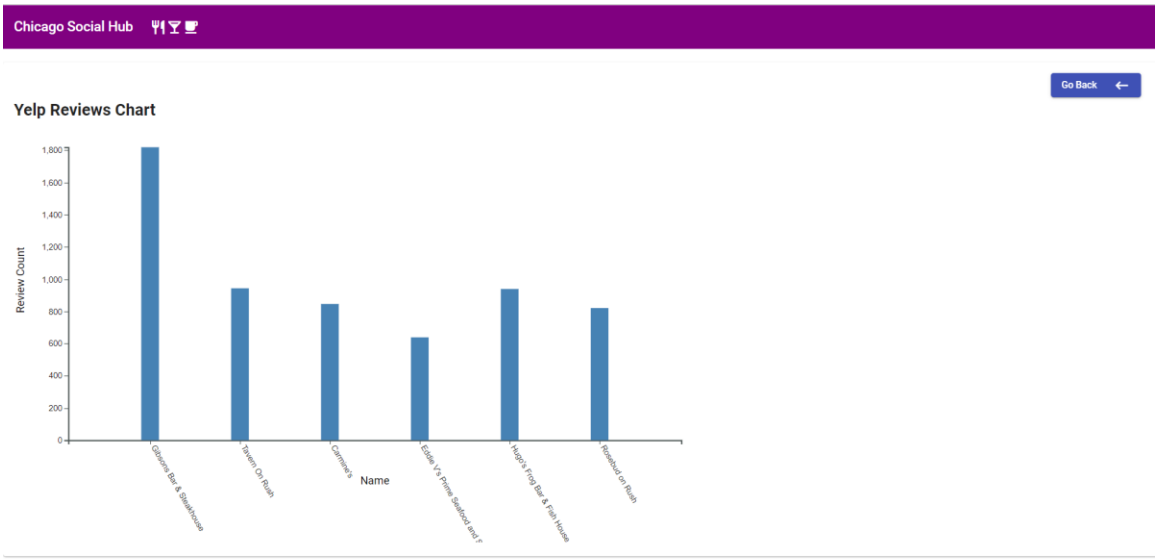
8. The search results for top rated Yelp-reviewed places based on the specified filter by the app-user shall be displayed on a web-page.



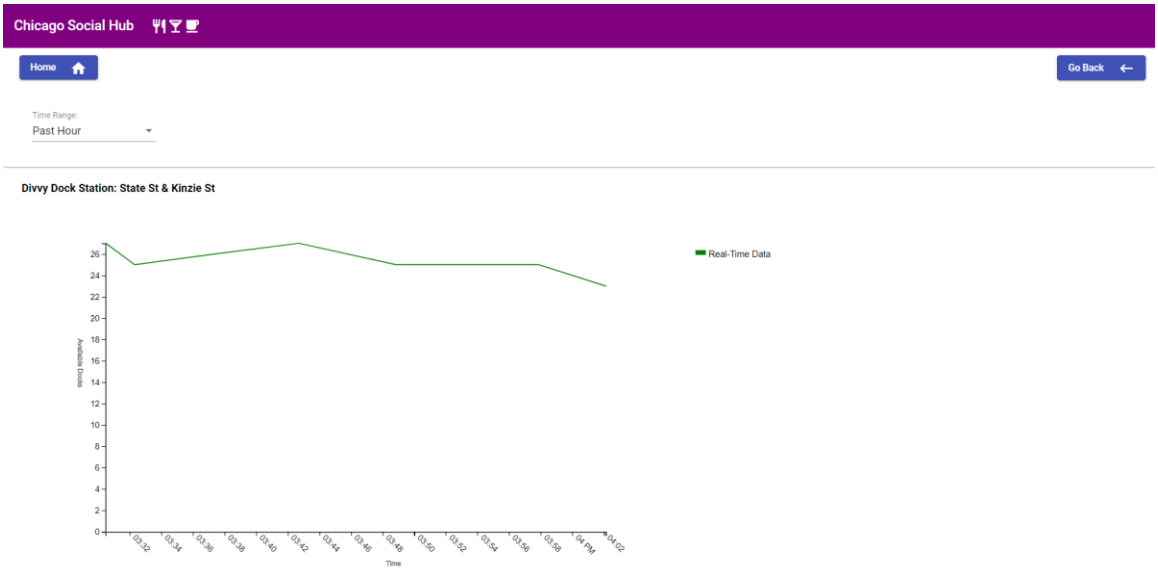
9. The app-user shall be provided with the capability to view the real-time status for the near-by Divvy docking stations of the selected place along with Google map for the current location, the selected place location, and the nearest 3 Divvy docking stations of the selected place.

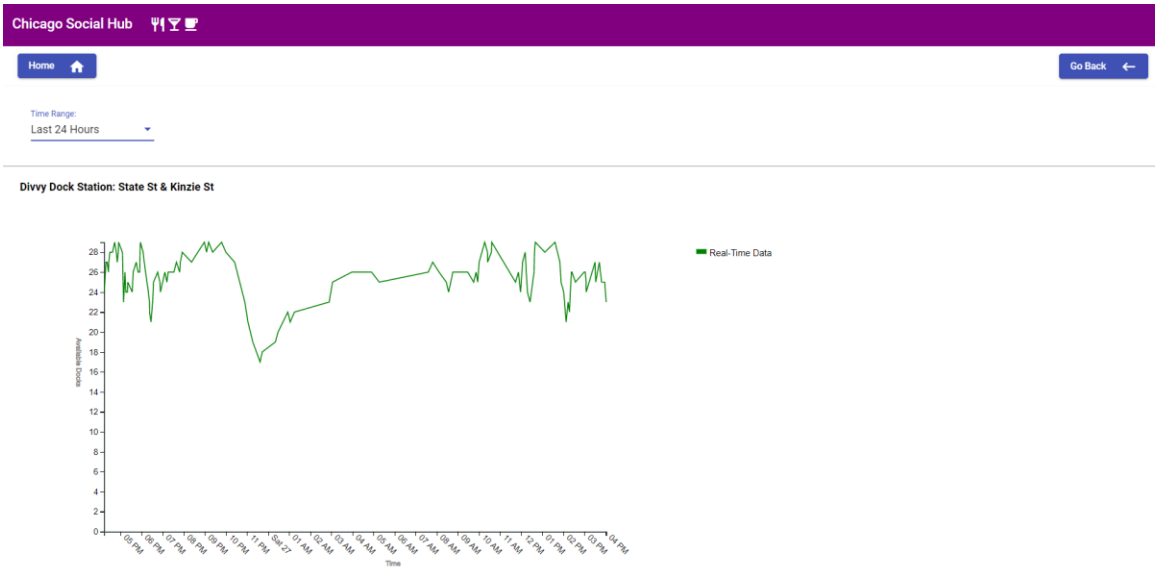


10. The app-user shall be provided with the capability to view the bar-chart for yelp reviews.



11. The app-user shall be provided with the capability to view the real-time line-chart for the status of the selected Divvy docking station. The Line-chart shall provide the app-user with the capability to select the time-range: past hour, past 24 hours, past 7 days data.





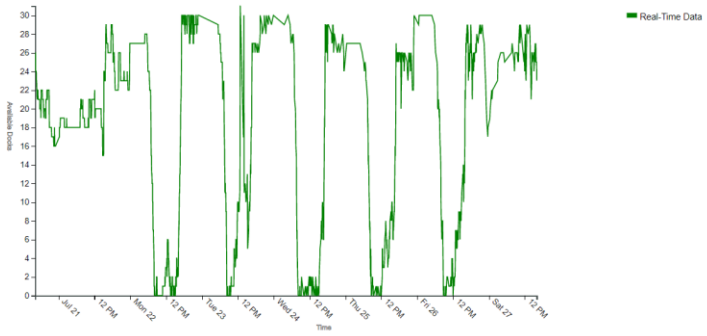
Chicago Social Hub

Home

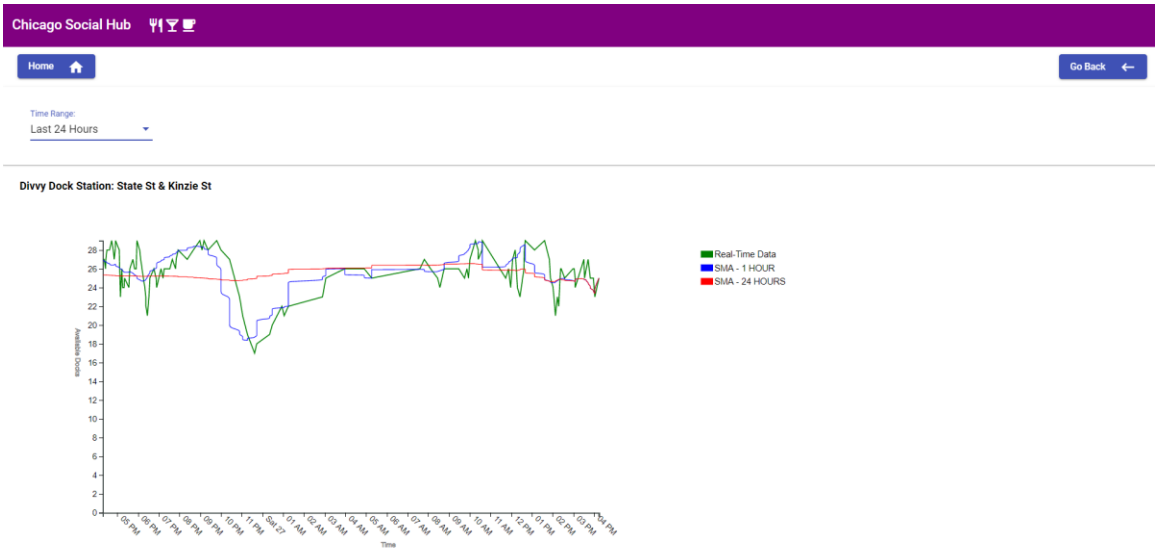
Go Back

Time Range:
Last 7 Days

Divvy Dock Station: State St & Kinzie St



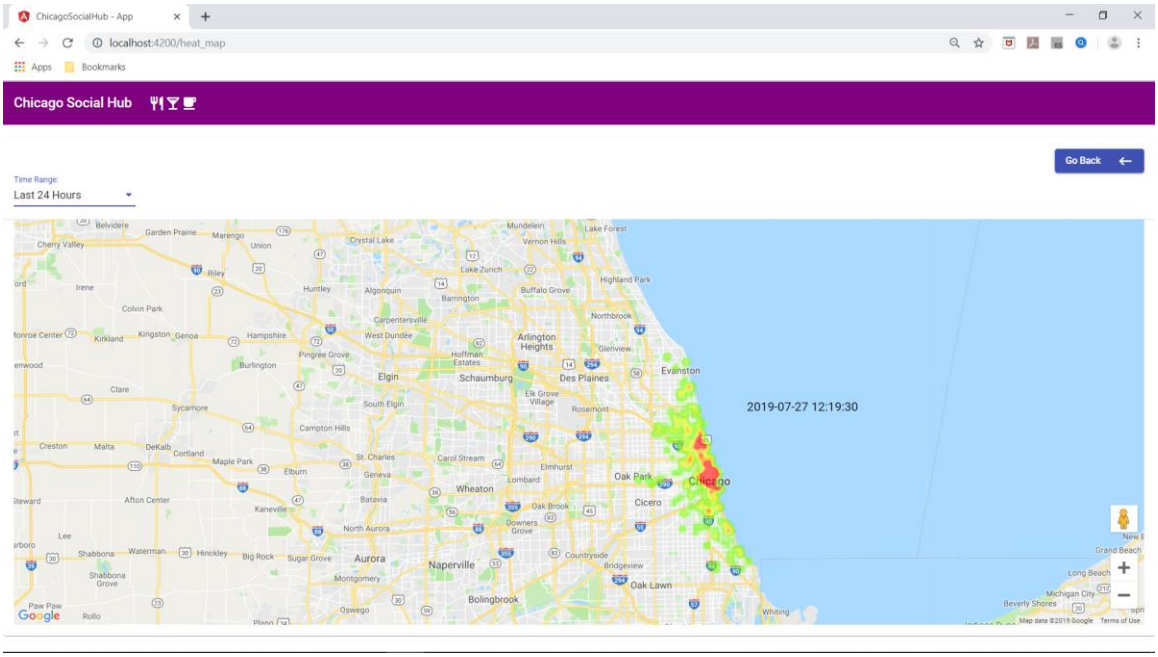
12. The app-user shall be provided with the capability to view the Simple Moving Average (past hour and past 24 hours) in a real-time line-chart for the status of the selected docking station. The Line-chart shall provide the app-user with the capability to select the time-range: past hour, past 7 days data.

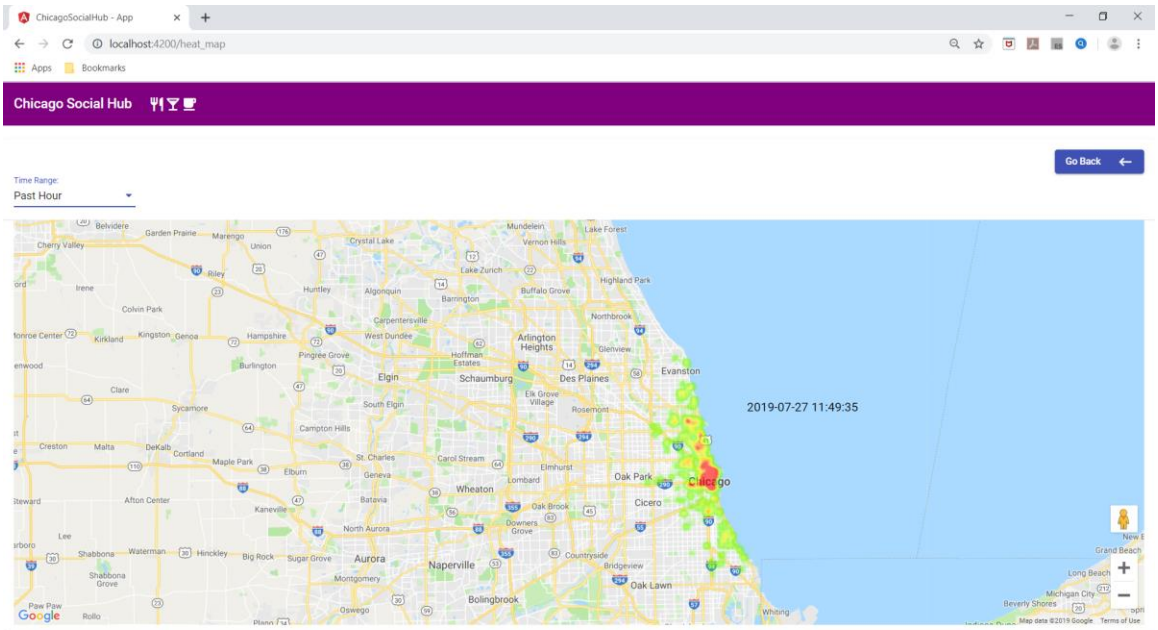


13. The real-time line-chart for the status of the selected Divvy docking station shall be updated/refreshed automatically every 2 minutes without the app-user manual refresh. The line-chart shall provide the app-user with the capability to select the time-range: past hour, past 24 hours, past 7 days data.

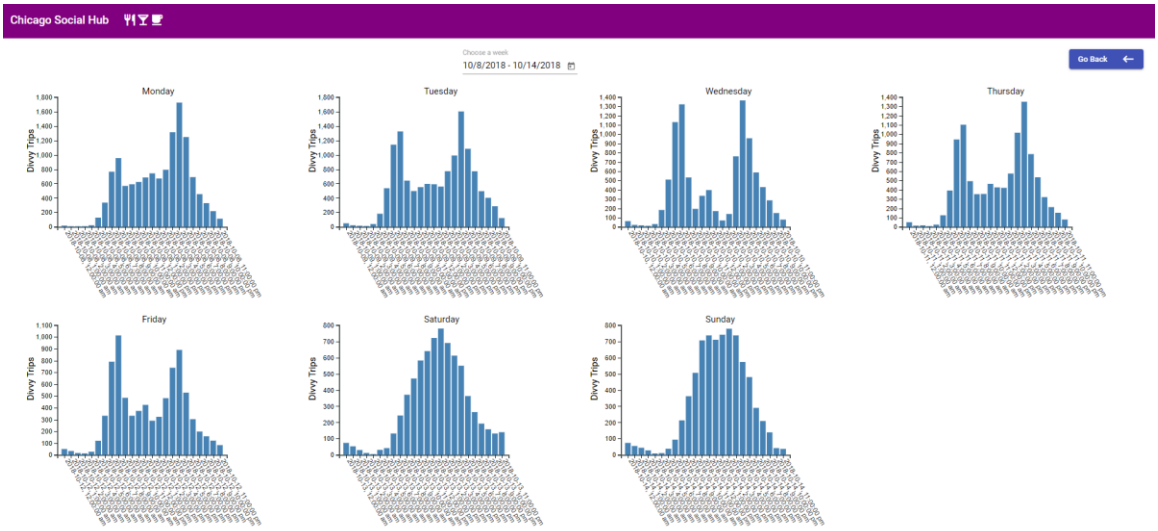
14. Create real-time Heatmaps for Divvy docking stations. Divvy can utilize the HeatMap to decide at which stations to place a valet (https://www.chicagotribune.com/redeye/redeye-divvy-stations-locations-20140901-story.html) to make sure riders have spots to dock at stations popular for drop-offs

15. The app-user shall be provided with the capability to view the Heatmap in a real-time for the status of the docking stations for the entire city of Chicago. The Heatmap shall provide the app-user with the capability to select the time-range: past hour, past 24 hours, past 7 days data.

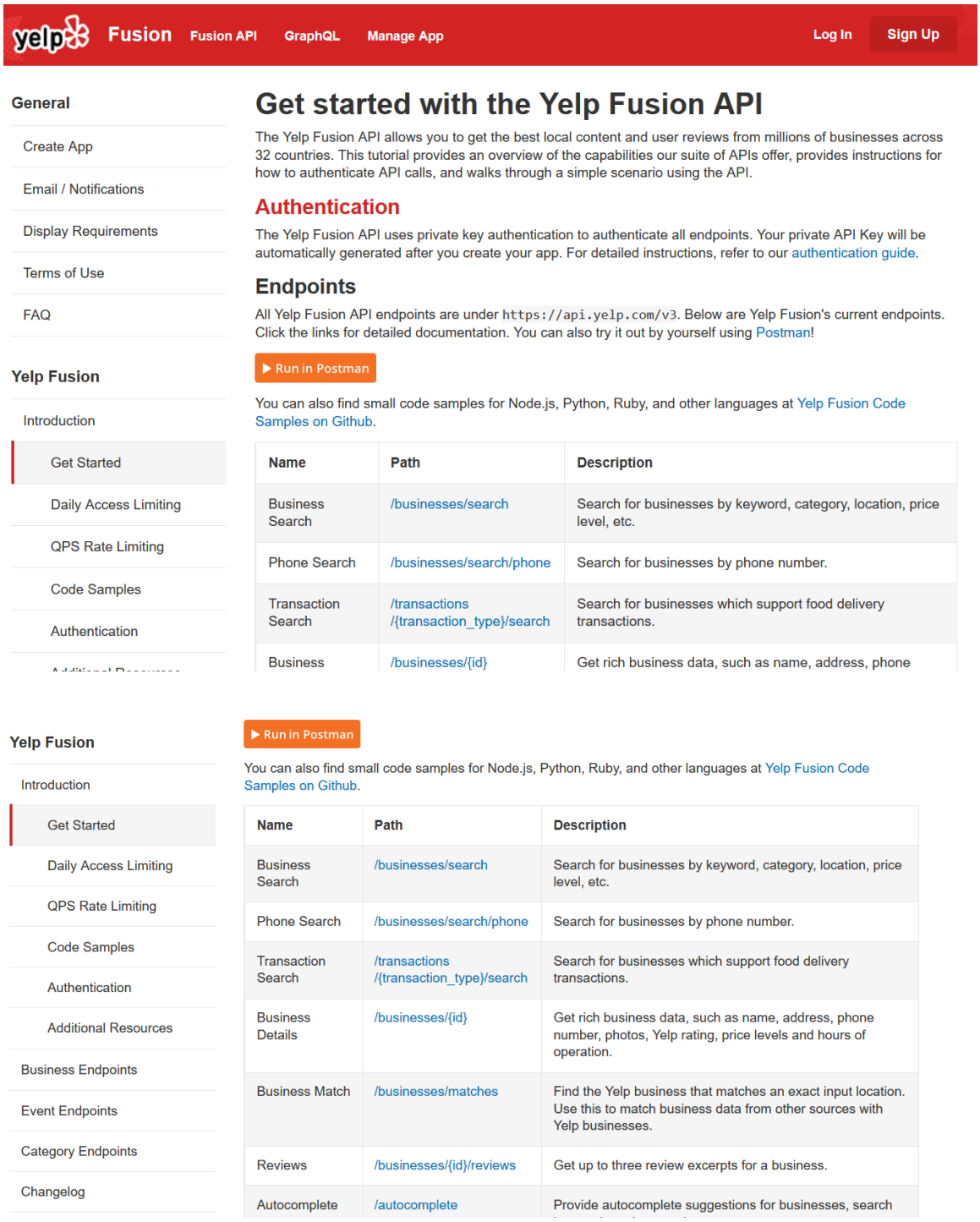



ChicagoSocialHub - App
localhost:4200/heat_map
Apps
Bookmarks
Chicago Social Hub
Go Back
Time Range:
Past Hour
2019-07-27 11:49:35
Chicago
Oak Park
Cicero
Evanston
Des Plaines
Schaumburg
Elgin
Arlington Heights
Wheaton
Naperville
Aurora
Bolingbrook
Oak Lawn
Google

16. The app-user shall be provided with the capability to use Divvy anonymized log data to view the count of Divvy hourly trips for every day of the week in order to analyze the chart patterns: double tops bar-chart for morning rush-hours and evening rush-hours. And the bell-curve bar-chart for the weekends or holiday days.



Appendix A. Yelp Business Reviews



yelp Fusion Fusion API GraphQL Manage App Log In Sign Up

General
- Create App
- Email / Notifications
- Display Requirements
- Terms of Use
- FAQ

Yelp Fusion
- Introduction
- Get Started
- Daily Access Limiting
- QPS Rate Limiting
- Code Samples
- Authentication
- Additional Resources
- Business Endpoints
- Event Endpoints
- Category Endpoints
- Changelog

Get started with the Yelp Fusion API

The Yelp Fusion API allows you to get the best local content and user reviews from millions of businesses across 32 countries. This tutorial provides an overview of the capabilities our suite of APIs offer, provides instructions for how to authenticate API calls, and walks through a simple scenario using the API.

Authentication

The Yelp Fusion API uses private key authentication to authenticate all endpoints. Your private API Key will be automatically generated after you create your app. For detailed instructions, refer to our authentication guide.

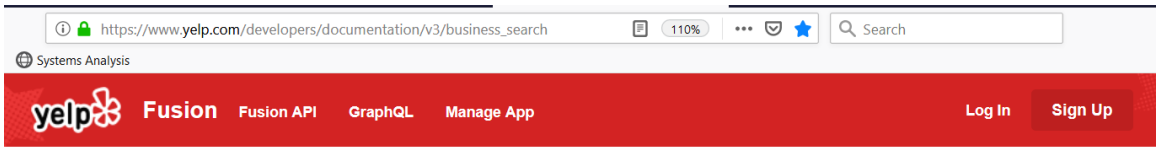
Endpoints

All Yelp Fusion API endpoints are under `https://api.yelp.com/v3`. Below are Yelp Fusion's current endpoints. Click the links for detailed documentation. You can also try it out by yourself using Postman!

▶ Run in Postman

You can also find small code samples for Node.js, Python, Ruby, and other languages at Yelp Fusion Code Samples on Github.

Name	Path	Description
Business Search	/businesses/search	Search for businesses by keyword, category, location, price level, etc.
Phone Search	/businesses/search/phone	Search for businesses by phone number.
Transaction Search	/transactions /{transaction_type}/search	Search for businesses which support food delivery transactions.
Business Details	/businesses/{id}	Get rich business data, such as name, address, phone number, photos, Yelp rating, price levels and hours of operation.
Business Match	/businesses/matches	Find the Yelp business that matches an exact input location. Use this to match business data from other sources with Yelp businesses.
Reviews	/businesses/{id}/reviews	Get up to three review excerpts for a business.
Autocomplete	/autocomplete	Provide autocomplete suggestions for businesses, search



/businesses/search

This endpoint returns up to 1000 businesses based on the provided search criteria. It has some basic information about the business. To get detailed information and reviews, please use the Business ID returned here and refer to /businesses/{id} and /businesses/{id}/reviews endpoints.

Note: at this time, the API does not return businesses without any reviews.

Request

```
GET https://api.yelp.com/v3/businesses/search
```

Parameters

These parameters should be in the query string.

Name	Type	Description
term	string	Optional. Search term, for example "food" or "restaurants". The term may also be business names, such as "Starbucks". If term is not included the endpoint will default to searching across businesses from a small number of popular categories.
location	string	Required if either latitude or longitude is not provided. This string indicates the geographic area to be used when searching for businesses. Examples: "New York City", "NYC", "350 5th Ave, New York, NY 10118". Businesses returned in the response may not be strictly within the specified location.
latitude	decimal	Required if location is not provided. Latitude of the location you want to search nearby.

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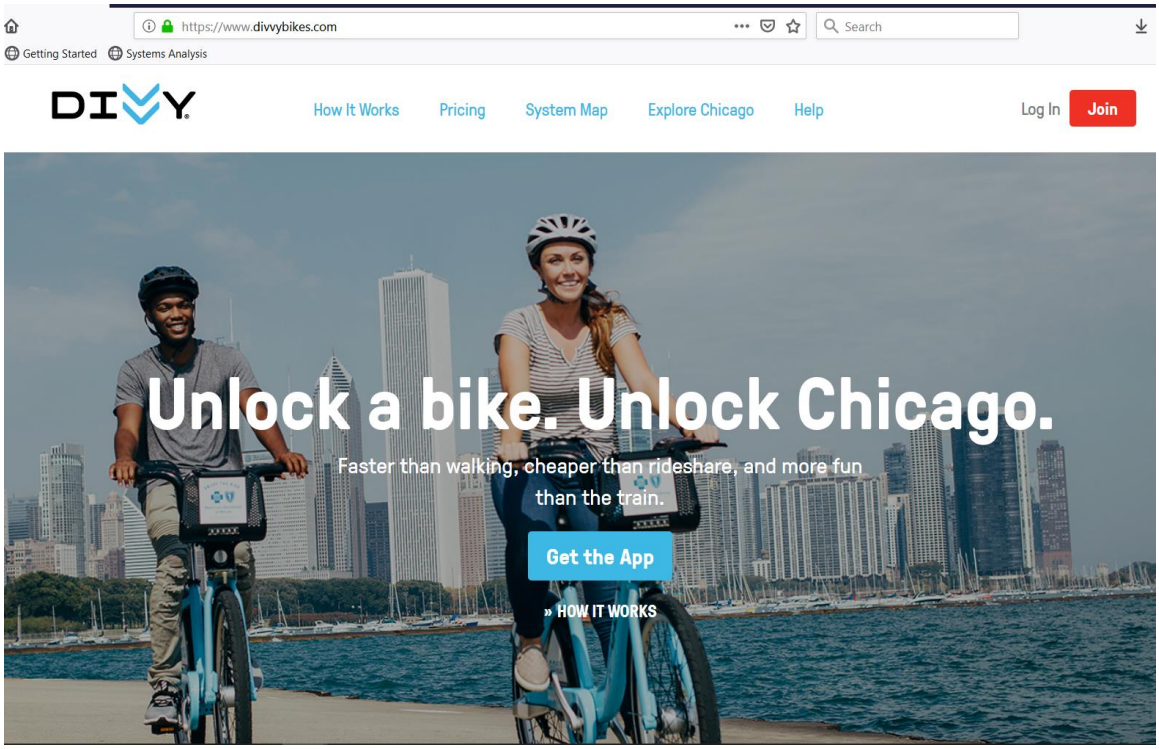
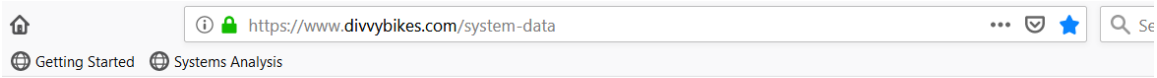
latitude	decimal	Required if location is not provided. Latitude of the location you want to search nearby.
longitude	decimal	Required if location is not provided. Longitude of the location you want to search nearby.
radius	int	Optional. A suggested search radius in meters. This field is used as a suggestion to the search. The actual search radius may be lower than the suggested radius in dense urban areas, and higher in regions of less business density. If the specified value is too large, a AREA_TOO_LARGE error may be returned. The max value is 40000 meters (about 25 miles).
categories	string	Optional. Categories to filter the search results with. See the list of supported categories. The category filter can be a list of comma delimited categories. For example, "bars,french" will filter by Bars OR French. The category identifier should be used (for example "discgolf", not "Disc Golf").
locale	string	Optional. Specify the locale into which to localize the business information. See the list of supported locales. Defaults to `en_US`.

Appendix B. Divvy Bikes and Docking Stations





Divvy Data

Historical trip data available to the public

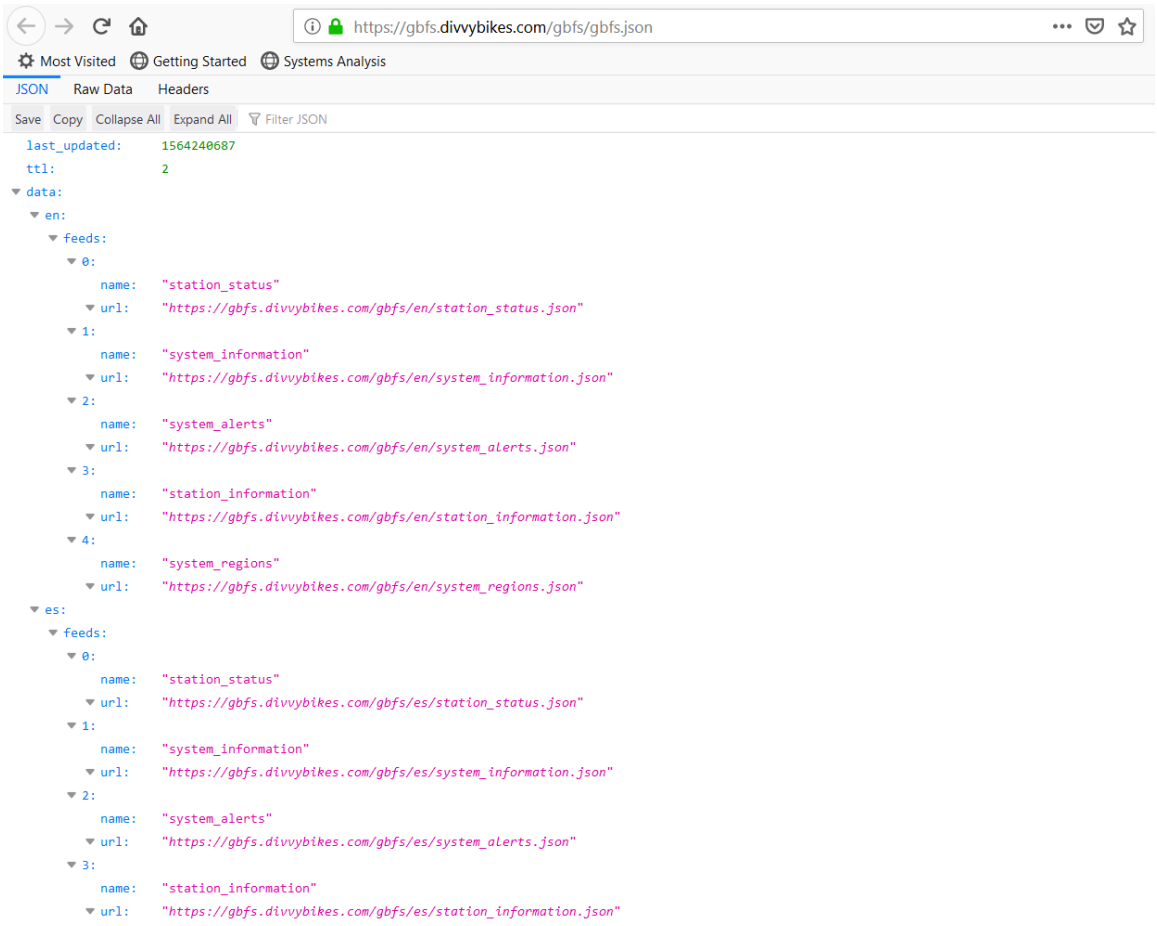
Here you'll find Divvy's trip data for public use. So whether you're a policy maker, transportation professional, web developer, designer, or just plain curious, feel free to download it, map it, animate it, or bring it to life!

Note that we'll be releasing trip data twice a year: once following the end of calendar Q2 and once following the end of calendar Q4. This data is provided according to the Divvy Data License Agreement.

The Data

Each trip is anonymized and includes:

- Trip start day and time
- Trip end day and time
- Trip start station
- Trip end station
- Rider type (Member, Single Ride, and Explore Pass)


https://gbfs.divvybikes.com/gbfs/gbfs.json
Most Visited
Getting Started
Systems Analysis
JSON
Raw Data
Headers
Save
Copy
Collapse All
Expand All
Filter JSON
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feeds:
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