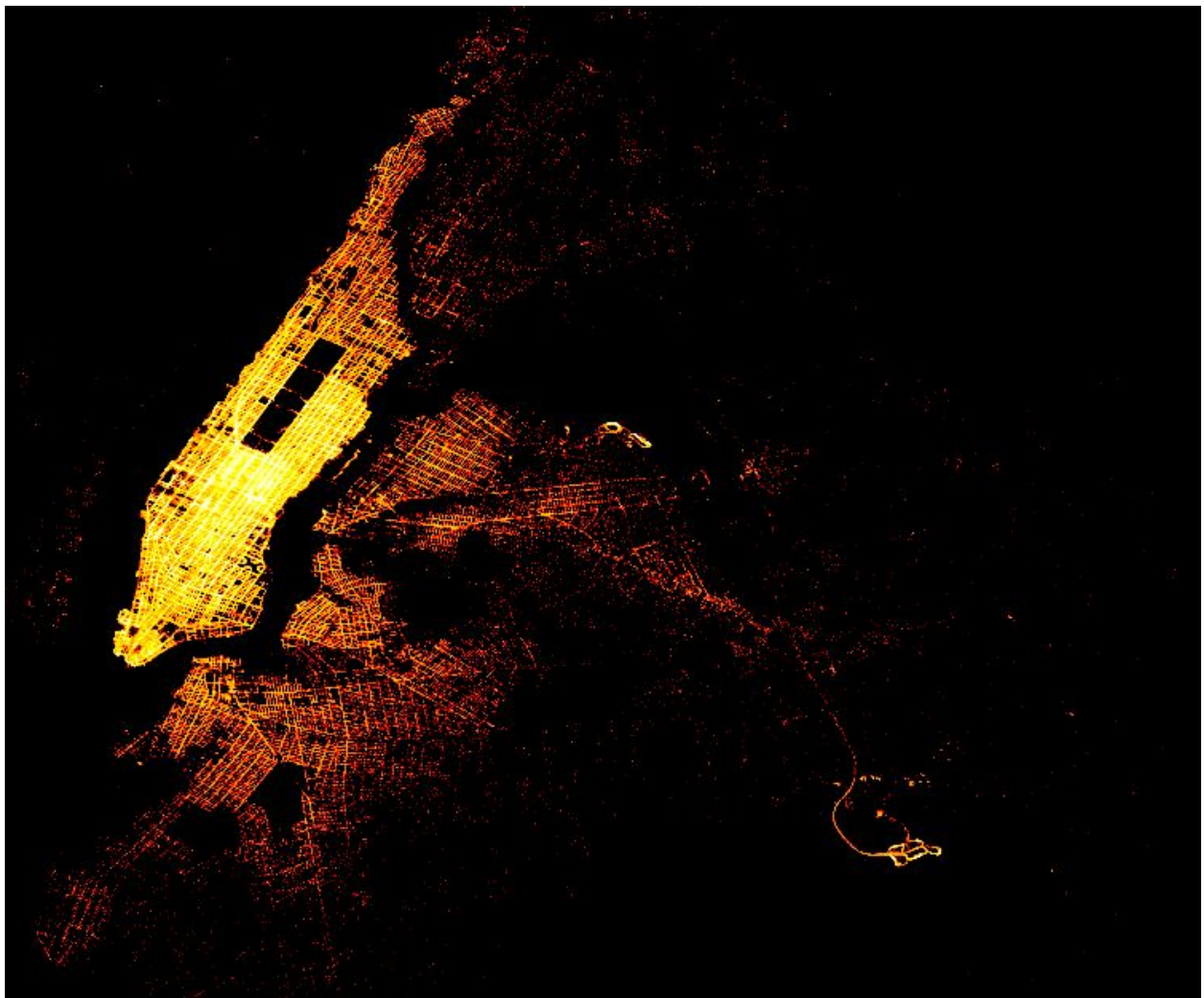


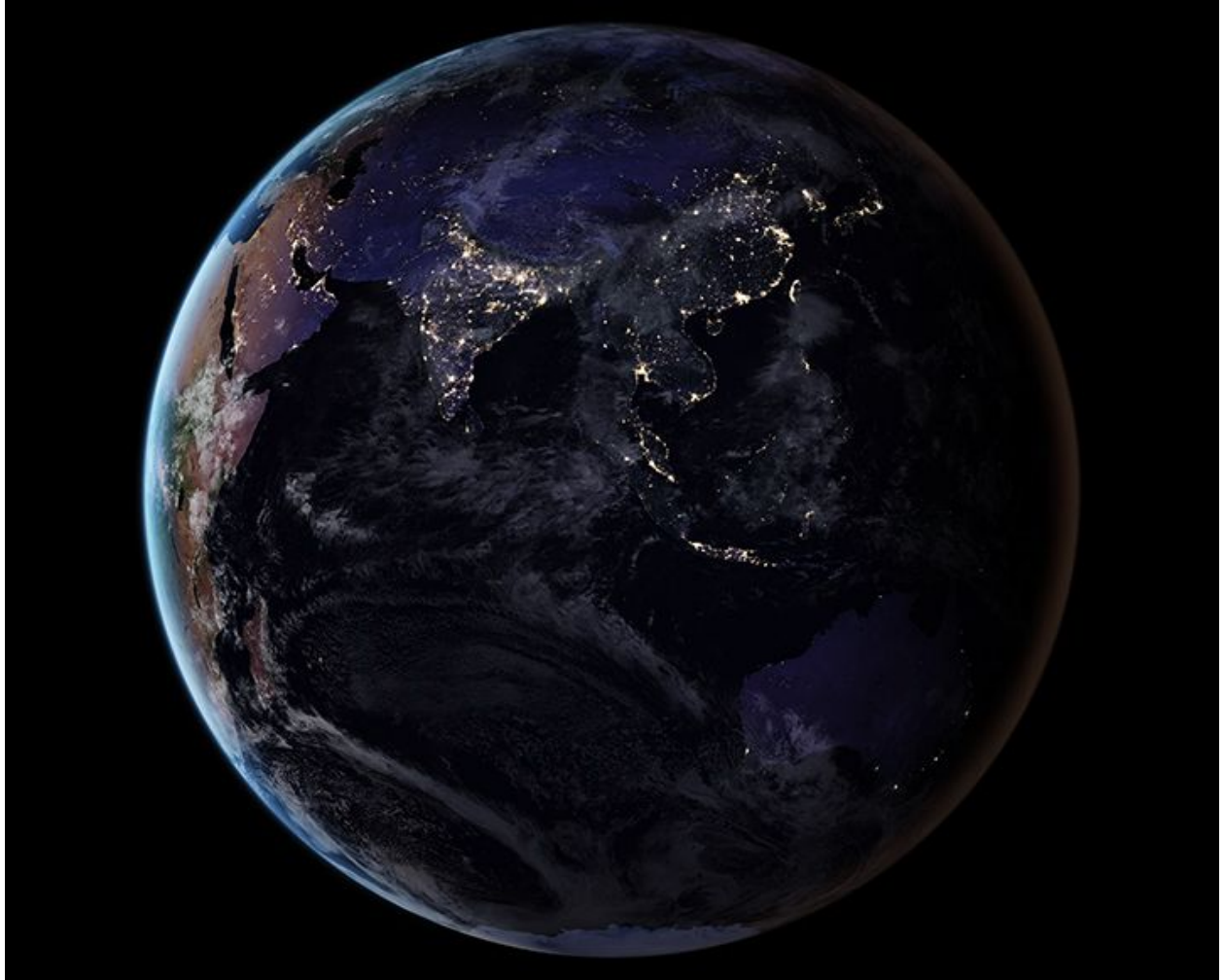
# Interview Task

Location is at the core of every business today. Whether you are moving people, goods or even milk and eggs, location adds a layer of context over your data. It tells you where your customers are, where your assets are and how to connect them. But, leveraging this data is not easy. It comes with its own challenges. Seeing a lat/long column in a spreadsheet adds no value and neither does visualize a million points on a map.

However, when used right it can be the key to understanding and improving any business. Here are some examples we at Locale love.



The image above is a visualization of 1.2 Billion taxi trips across NYC



VIIRS satellite Image used to capture nighttime light activity. Read more about it here:  
<https://disasters.nasa.gov/news/new-night-lights-maps-open-possible-real-time-applications>

## Background

One of the leading ride-hailing companies, XRides in Bangalore has approached Locale to help use its location data to make better decisions. They have shared a dataset of ~40,000 trips with their time, starting and ending locations along with some other attribute data.

Using this dataset, we can recommend better geo-marketing tactics and increase cab utilization, tell the drivers where to be at different times of the day to bridge supply and demand gaps or help reduce cancellations. For this exercise, use one of the below-attached tasks that best suits your skills and deliver a solution. Now, we need your help.

You can also choose a combination of tasks that fit your area of interest. Along with the code, we also expect you to understand the dataset, share your inferences and write up a document about your approach and understanding of the problem.

The task will be judged on code quality, implementation details and your write-up about the approach to solve the problem.

Your deliverables will essentially be your code and a write-up!

Best of Luck!

## Data Description

- id - booking ID
- user\_id - the ID of the customer (based on mobile number)
- vehicle\_model\_id - vehicle model type.
- package\_id - type of package (1=4hrs & 40kms, 2=8hrs & 80kms, 3=6hrs & 60kms, 4= 10hrs & 100kms, 5=5hrs & 50kms, 6=3hrs & 30kms, 7=12hrs & 120kms)
- travel\_type\_id - type of travel (1=long distance, 2= point to point, 3= hourly rental).
- from\_area\_id - unique identifier of area. Applicable only for point-to-point travel and packages
- to\_area\_id - unique identifier of area. Applicable only for point-to-point travel
- from\_city\_id - unique identifier of city
- to\_city\_id - unique identifier of city (only for intercity)
- from\_date - time stamp of requested trip start
- to\_date - time stamp of trip end
- online\_booking - if booking was done on desktop website
- mobile\_site\_booking - if booking was done on mobile website
- booking\_created - time stamp of booking
- from\_lat - latitude of from area
- from\_long - longitude of from area
- to\_lat - latitude of to area
- to\_long - longitude of to area

- Car\_Cancellation - whether the booking was cancelled (1) or not (0) due to unavailability of a car.

## Front-end Task

The goal for you in this task is to create a front-end application where the user can upload a CSV, select the Latitude and Longitude column of the CSV and then view the points on the map.

Fairly, straight-forward right?

Now the tricky part, after creating this basic visualization, you need to create some charts and graphs that depict a story and are useful for the end-user. For example, you could plot the medium of booking, a visualization of distances or a plain-old time-series histogram.

Remember, Design Matters!!

### **Brownie Points:**

1. If your chart or bar-graph also acts as a filter and filters the data on the map
2. The query DSL that you would write if the data wasn't available locally and had to be fetched from a server.

### **Technologies:**

Our ideal front-end framework is Vue/React. But choose a framework that you're most comfortable with.

Use Mapbox-GL-JS or Leaflet-JS for the map visualization and your favorite charting library.

## Back-end Task

XRides, delivers about a 200 rides per minute or 288,000 rides per day. Now, they want to send this data to your system via an API. Your task is to create this API and save the data into PostgreSQL.

The API should be designed, keeping in mind the real-time streaming nature of data and the burst of requests at peak times of the day. The user of this API expects an acknowledgment that the data is accepted and a way to track if the request fails.

### **Brownie Points:**

1. Write a query DSL of how you would want this data to be queried and how someone would be able to run analytics operations on top of it.
2. Write up on the ideal system architecture and the design of API given enough time and resources.

**Technologies:**

Our ideal stack is Python/Go. But feel free to use the language of your choice.

## Data Science Task

The biggest challenge for XRides is to increase the utilization rate of their cabs. However, the demand keeps fluctuating based on the area, time of day, etc. Your task is to devise a geo-surge strategy that would help them incentivize their drivers. Identify what areas and at what times get most bookings and how would you increase the price in those areas in order to meet the demand.

More than any other task, it will be critical for you to get a deep understanding of the dataset, the business and how you can help them.

**Brownie points** if you share a recommendation or strategy backed by data that helps them reduce cancellation, increase revenue or reduce costs.