

# Easy Cabs

A web application for calculating dynamic price of Uber and Lyft cabs

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[Github repository](#)

## **Introduction**

Uber and Lyft account for the major market capitalization for offering cab services on an app.

But these prices are not constant like public transportation. They are greatly affected by the demand and supply of rides at a given time.

So what exactly drives this demand? Some of the factors include weather changes, rush hours and location.

## **Domain**

Machine Learning, Software Design, UI/UX

## **Goals**

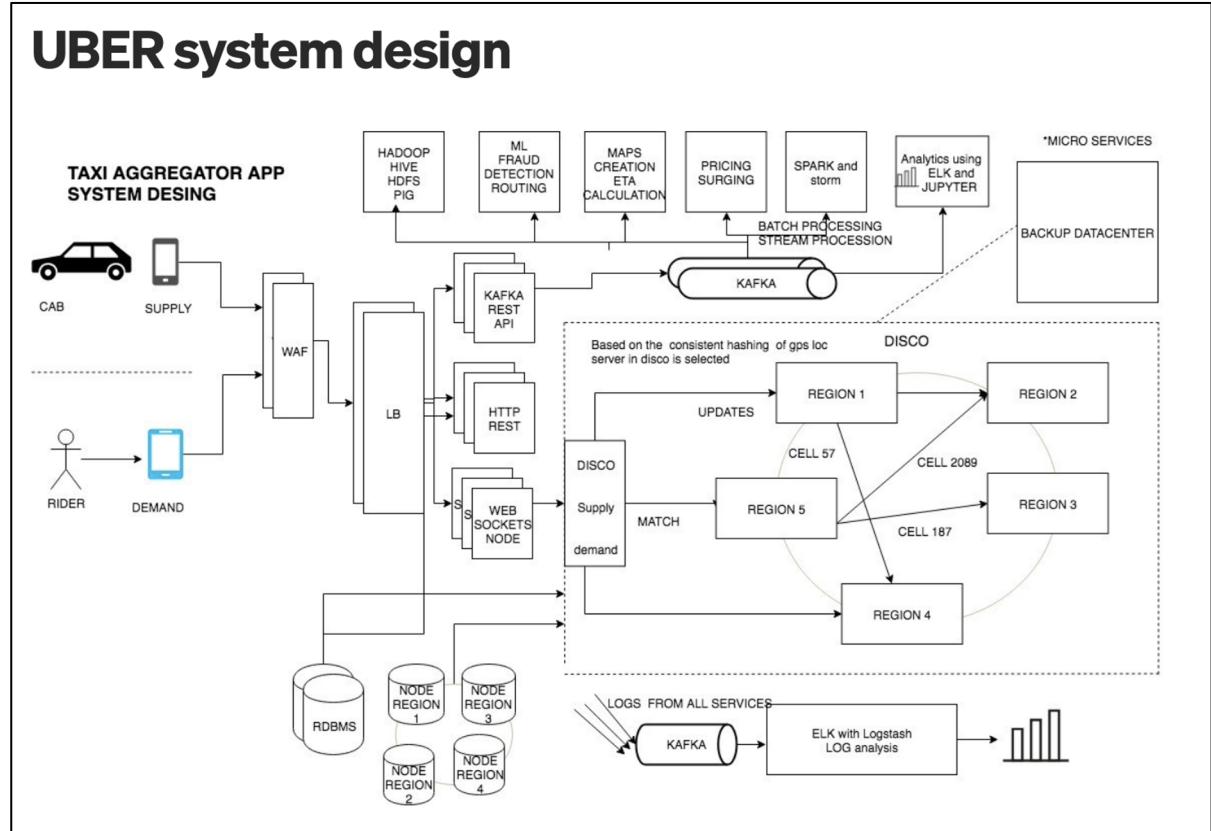
- To understand the software design, code and use of APIs for large scale systems.
- Learn software Design for scalable systems
- Study, design and implement a well thought out ML application following software design principles like separation of concerns, abstraction and refactoring.

## Background

Parameters like Rush hour, traffic, weather conditions, source and destination was inspired based on the background research conducted.

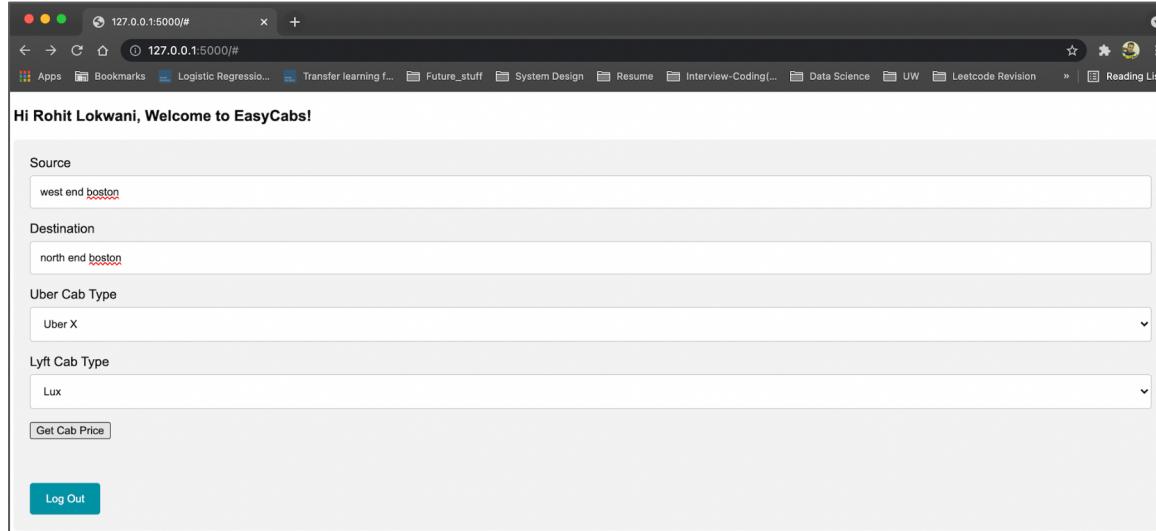
ML model parameters considered referring to Uber's blog:

<https://www.uber.com/en-GB/blog/uber-dynamic-pricing/>



## Problem Statement

Develop a thoughtfully designed ML-based web application which compares dynamic price of Uber and Lyft cabs depending on user requirements



*prototype output*

## Data & Limitations

### [Uber & Lyft Cab Prices Dataset | Kaggle](#)

#### Features

- cab\_type : Uber or Lyft.
- clouds : presence or absence of clouds.
- destination : name of the destination in words.
- humidity : humidity in percentage.
- location : location of the place where the weather is recorded.
- pressure : atmospheric pressure in millibar.
- price : price estimate for the ride in USD.
- rain : rain in inches for the last hour.
- name : type of the car specified, eg. X, XL.
- source : name of the source in words.
- surge\_multiplier : 5 unique values mentioned.
- temp : temperature in Fahrenheit.
- time\_stamp : start of the cab journey in epoch units.
- wind : wind speed in miles per hour.

#### Limitations

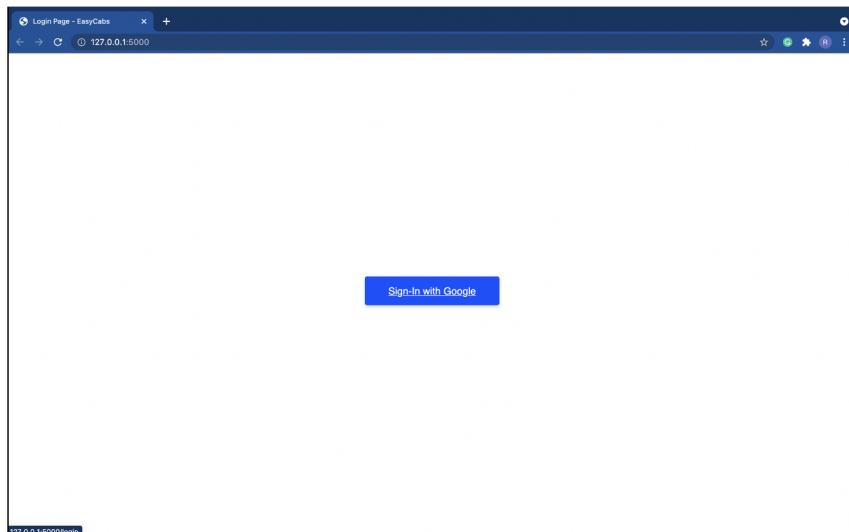
- Dataset restricted to areas within Boston, MA

## User Interaction

This application helps the user in choosing a cab from Uber or Lyft as per the dynamic cost output generated.

User input requirements: -

- Enters source and destination.
- Provides cab types for uber and lyft.

A screenshot of a web browser showing the main application interface. The URL bar shows '127.0.0.1:5000/#'. The page displays a welcome message 'Hi Rohit Lokwani, Welcome to EasyCabs!' followed by several input fields:

- Source: 'west end boston'
- Destination: 'north end boston'
- Uber Cab Type: 'Uber X'
- Lyft Cab Type: 'Lux'

A blue button labeled 'Get Cab Price' is at the bottom. A 'Log Out' button is located at the bottom right.A screenshot of a modal window titled 'Source' with a dropdown menu for 'Uber Cab Type'. The menu lists several options: 'Black' (which is selected and highlighted in blue), 'Black SUV', 'Uber Pool', 'Uber X', 'Uber XL', and 'WAV'. At the bottom of the menu is a blue button labeled 'Get Cab Price'.

## User Interaction

**Program:** Calculates the surge and price prediction

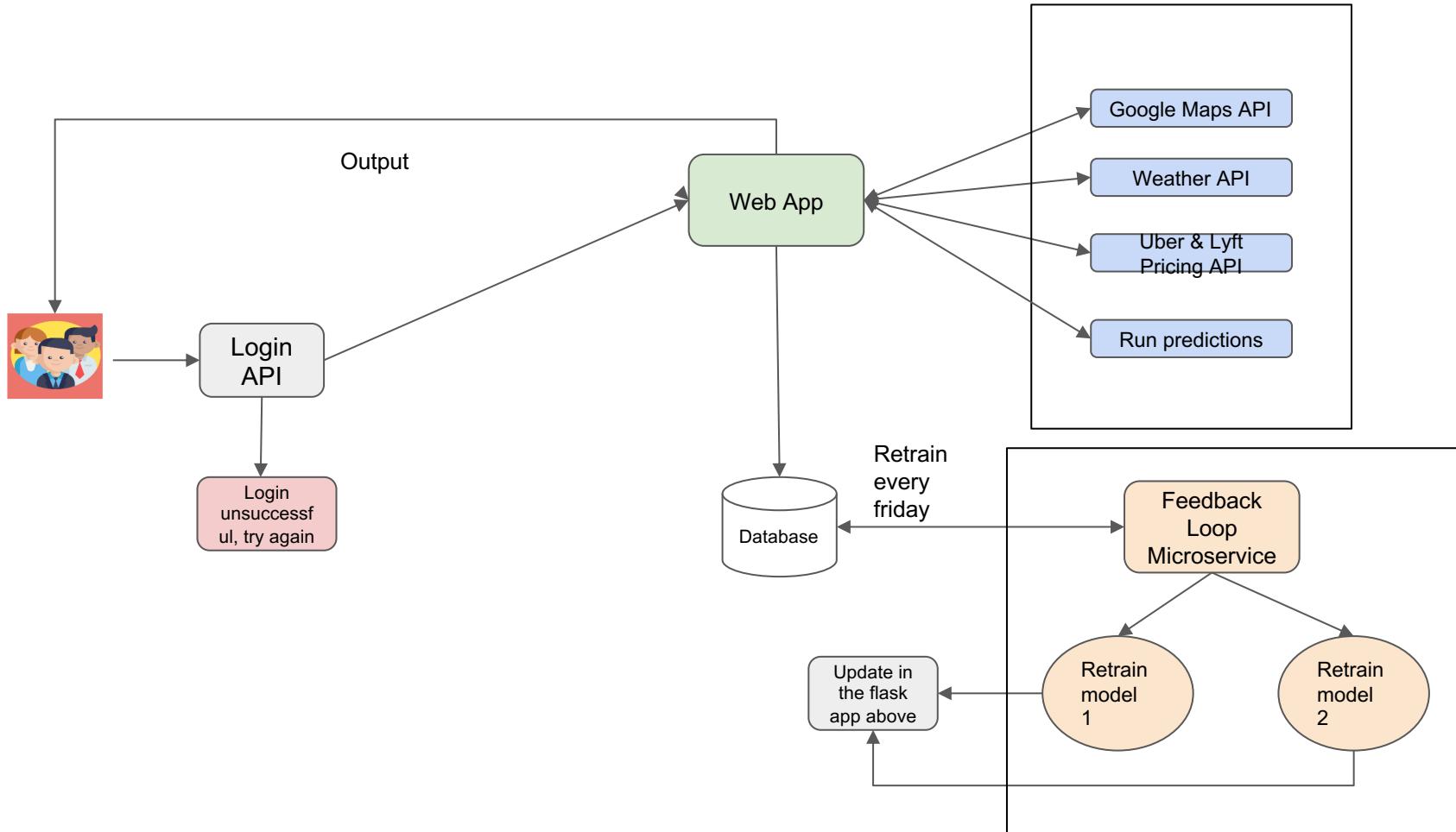
**Output:** Returns result as follows

The screenshot shows a web browser window with a dark blue header bar. The address bar displays the URL "127.0.0.1:5000/getCabPrice". Below the address bar, there are navigation icons: a left arrow, a right arrow, and a refresh icon. The main content area of the browser displays the following text output from the program:

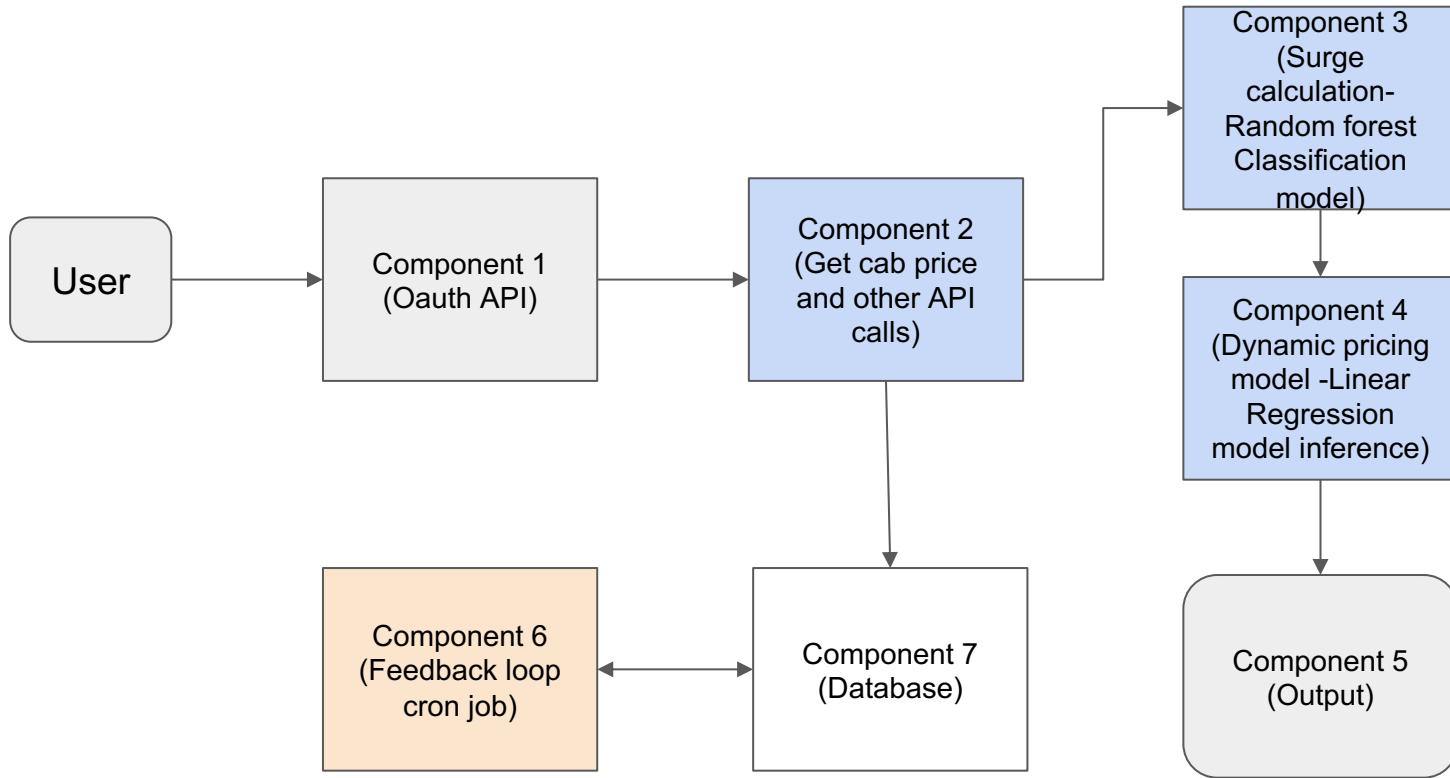
Uber Price: \$8.74  
Lyft Price: \$15.62  
ETA: 11.0 minutes  
Distance: 1.06 miles

At the bottom left of the browser window, there is a "Log Out" button.

## High Level Design



## Low-Level System Design (Component Design)



# Demo

## How our Models work compared to Uber and Lyft

Uber X and Lyft Lux selected which gave the following price prediction



127.0.0.1:5000/getCabPrice

127.0.0.1:5000/getCabPrice

Uber Price: \$8.74

Lyft Price: \$15.62

ETA: 11.0 minutes

Distance: 1.06 miles

Log Out

Uber Cab Type

Uber X

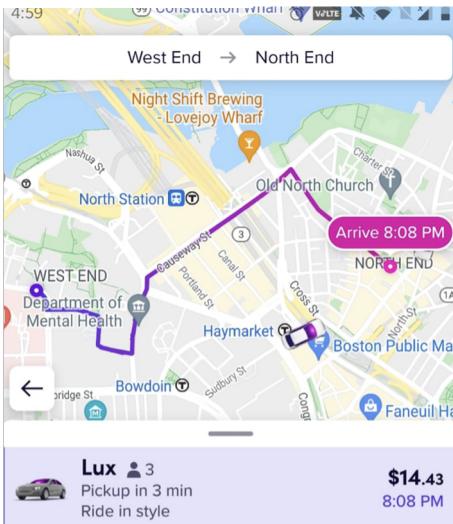
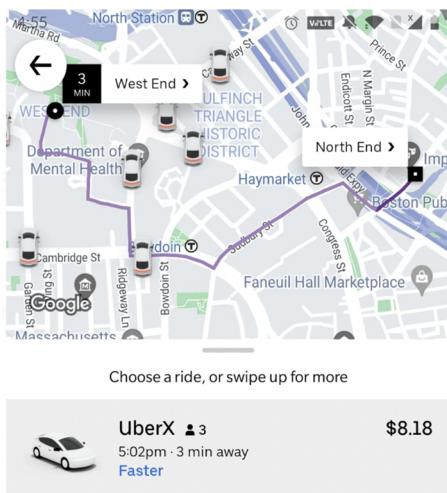
Lyft Cab Type

Lux

Get Cab Price

Log Out

Uber X and Lyft Lux selected at the same time.



Easy Cabs

	Real App	Easy Cabs
Uber X	\$8.18	\$8.74
Lyft Lux	\$14.43	\$15.62

## Lessons Learned

- Importance of code readability
- Working on collaborative projects (Used excel for task management)
- Streamlining development using version control, unit testing and Continuous Integration
- Writing scalable software
- Why some of the following are important and we incorporated them:
  - Code extensibility
  - Separation of concerns
  - Abstraction
  - Developing APIs as deep modules with minimal interface

## Future work

- 1) Add database
- 2) Add Deployment (Development/application Server)
- 3) Add logging and monitoring mechanism
- 4) Get Uber and Lyft API server tokens to make the feedback loop fully functional

**Thank You!**