Final Project Report:

Curb-N

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Website Link: http://curbn.herokuapp.com/

Abstract:

Every college campus is the birthplace for a different kind of adventure. With so many different people and so much diversity of interests, it might be hard to find the right adventure or the right people to experience it with. One of the best parts to a great experience are the kinds of people you meet along the way, so why not spend them with the kind of people who share similar interests with you? Curb-N is the app that will solve all these problems. Providing a great experience with a more personalized touch is what our event-based ride-sharing application is all about. Along with putting our users first, we aim to get to know them better by providing a friendly user interface that encourages exploration and recognizes specific user interests. Overall, whether you're a young, adventurous soul in search for your next adventure, or someone who is just trying to finally get out there and don't want to travel alone, Curb-N promises to be the tool that will always get you where you need to be.

Introduction:

We're introducing a new innovative ride-sharing app intended on helping users connect to other like-minded travelers with similar interests. This web application will be a centralized mix between a user-friendly event planning application as well as a ride-sharing aid. Although there are ridesharing applications and event based applications currently on the market, there is yet to be a healthy union between the two.

Although the idea of ride sharing is generally straightforward, there is an important difference with Curb-N, spontaneity and routine. Rarely you find those words in the same sentence, but this is the functionality we are trying to provide through the use of Curb-N. Through our application, we've developed a more personalized and cheaper alternative to other

apps out on the market today. The more you use Curb-N, the better our technology will get to know you, thus leading to a more personalized and rich experience. By getting to know the user better, our system can then recommend different kinds of events that are going on in their area as well as help the user find drivers and other passengers with similar interests. Going to new events and making a couple new friends along the way is a sure-fire way to create memorable, long-lasting experiences. Later on in the report we will talk about our technology and how we plan on getting everything integrated and implemented within Curb-N.

Novelty and Motivation:

Lower Prices:
      As we can see nowadays, traffic congestion on the roads has become a serious day to day issue. Traffic costs in the 50 largest urban areas impose an excess of $70 billion annually, however, trying to add more highways to take some of the stress off the more popular roads becomes a serious environmental issue[6]. With this kind of area wide congestion, the demand for public transit and carpooling services are expected to rise[3]. The team behind Curb-N wants to welcome and reward those who choose to carpool by offering them transportation with cheaper travel costs. We implement this through the use of gas splitting-services built into our interface. It works simply: the amount of gas money needed for a specific trip is split amongst the driver and the amount of riders in his car. Now our gas splitting service is just a recommendation. Driver's are ultimately in charge if they want to higher or lower their prices, and it is up to riders to decide whether they agree to paying the specified price for a certain carpooling session. In the end, however, we want to stress that the system behind Curb-N is not intended for drivers to make huge profits. We are simply a platform where users with likewise-interests can reasonably share the experience of time on the road together.

Personalization:
      We have designed Curb-N with the user in mind. We want our members to be able to use our system with relative ease and fluidity, as well as have a service that fulfills their needs and keeps them coming back.[2] One way we do this is by the implementation of our event-based and event sharing system. This feature allows for a more personalized experience with our users. In order to accomplish this, upon signup we find out what kind of events our users likes. Once initial registration has been completed, our system uses the information collected on the specific type of events a user likes and will begin to populate their feed with events similar to, or exactly like, the kinds they specified on during the registration and setup process. In this way, users will be exposed to more and more events of interest, inciting them for continued use of our app.

In the future we hope to upgrade our system to analyze our users' past drives and carpools in order to further modify their search and interest options, thus adding more precision to their searches as well as our recommendations to them. In getting to know our users better, we only hope to offer the best services and improve their experiences through each continued use.

Technology:

Related apps: Hitch-a-ride app

There are many ride based applications that have launched since the mobile device became a reliable method of connecting to the internet: lyft, uber, sidecar, hitcharide, and the list continues with budding carpooling services, like uberpool, lyft pool and waze carpool. There are also applications such as eventbrite. Research has shown Curb-N is neither a ride sharing application nor an event based application but rather a much needed reconciliation of both.

For part of our research, our team ran a number of miniature usability tests on a couple of the already popular ride-sharing apps currently on the market, as well as some of their smaller competitors. Our goal in running these tests was to find both the similarities and differences in design and concept between them and Curb-N, as well as to compare functionality, aesthetic feel, costs, etc. Through this process, we were able to isolate and enhance the characteristics that make Curb-N stand out from the rest, as well as improve on any similarities to better our user's experience.

During our research into similar concepts on the market, one of the most similar ideas that our team came across was a mobile application by the name of Hitch-A-Ride that initially promised almost identical results as Curb-N - a social network for drivers and riders to connect and carpool to destinations. This would, in turn, lower travel costs as well as travel time (when compared to modern public transportation). Upon delving into it further, we discovered that although the app advertised its availability for both iOS and Android phones, there was no trace of it on the Android market**. (sidenote: our team did find a Hitch-A-Ride app on the android market, however it was made by a different company and as of now, their services have been discontinued**). We concluded that it would be in our best interest to expand to more platforms and possibly widen a user-base. Curb-N being a web app, allows for a wider audience across all devices with accessibility to the internet, thus providing universal usability. Neither interface handles transactions, which was a design decision the Curb-N team made early in development.

At its core, Hitch-A-Ride does a good job at connecting riders and drivers, however the team behind Curb-N saw great potential to expand with this idea to get users more involved and wanting to come back. Curb-N is very much focused on getting to know the user in order to provide good suggestions and offer more fluid interaction and connectivity. It accomplishes that by its event-planning and event-sharing interface which is aimed at keeping user's engaged and exploring further. We also ran into a bug in Hitch-A-Ride's "requesting a ride" feature that disallowed us further use and made the process, overall, rather frustrating. All in all Curb-N provides more of the features and functionality that Hitch-A-Ride missed out on, thus ultimately providing a better user experience. **[7]**

Information retrieval: Event based

At this moment, our event and user based searches are not implemented. There is no current matching system regarding those services. However, we have discussed our ranking system for both features.

The ranking feature for event searches is based on three different metrics:

percent matching event title**(pm)**, matching tag**(mt)**, and matching tags AND/OR percent matching keywords**(pm_mt)**.

Based formula (out of 100 points): best_event_score = 45pm + 45*pm + 10*pm_mt

The ranking feature for user based search is based on four different metrics:
Distance between drivers/riders (a bracket value for different ranges) (**DeltaDR**), percentage seats unavailable for drivers **(SeatUnAvail)**, zip code of drivers/riders **(ZipDR)**, and destination between riders and the event (**DeltaRE)**.

Based formula (out of 100 points): best_matching_score = 40*DeltaDR - 100*SeatUnAvail + 10*ZipDR + 30*DeltaRE.

Heroku as a web service/hosting site/server:
Originally, we planned to use Amazon Web Service to host our site and gain access to the Postgresql DBMS. We have opted for Heroku due to a team member's prior experience with it and because this is a small scale project in which we wanted to get something out (as well as not requiring many dependencies within our project)**[8]**.
We intend to use it due to the dynamic nature of our website, pulling events from Eventbrite and updating our database automatically at certain intervals. Below is the list of table object we have planned for us in this project.

1. **User table** - This will house all the necessary info, preference, and requests each user has.
    a. Account(email) - string
    b. Contact_info(name,email, phone, etc) - string
    c. Preferences (table object)
    d. Status (driver/rider) -> string
    e. Rating (Just general evaluation of users) - double
    f. Events-requested/going to (table object)
2. **Preference Table** - This table will contain information necessary for our ranking and search system to work.
    a. Interests (tag objects) - strings, keywords for ID i.e. (concert, festival, sports, transportation, etc)
    Explain this section more
   b. Current location (will contain user/event info depending on action) - strings
3. **Event table-** This table will contain all info regarding the event, such as any users who have requests to a specific event. Fees and description of all transactions will be given here.
    a. Events (tags objects) - strings
    b. Title (name) - string

c. Start_time (datetime)

d. Pick_up_time (an agreed upon time) - datetime

e. User (who requests a ride/pickup.) - User

f. Fees (for gas money or other topics) - double, will have a trip calculator to give rough estimate to users

g. Description (Mandatory, will detail any requirements to attend the events specifically)- string

h. Location (Mandatory, displays the location of the event and drivers/riders) - String

Architecture:

Our project contains three main components: Pushover, the Curb-N Server, and the Curb-N web app (powered by Heroku). The Eventbrite API will provide our site a dynamic data stream for pulling events from EventBrite's database to ours. The Google Map API will take input from the server and will return the output to both server and web app. Here are our interactions.
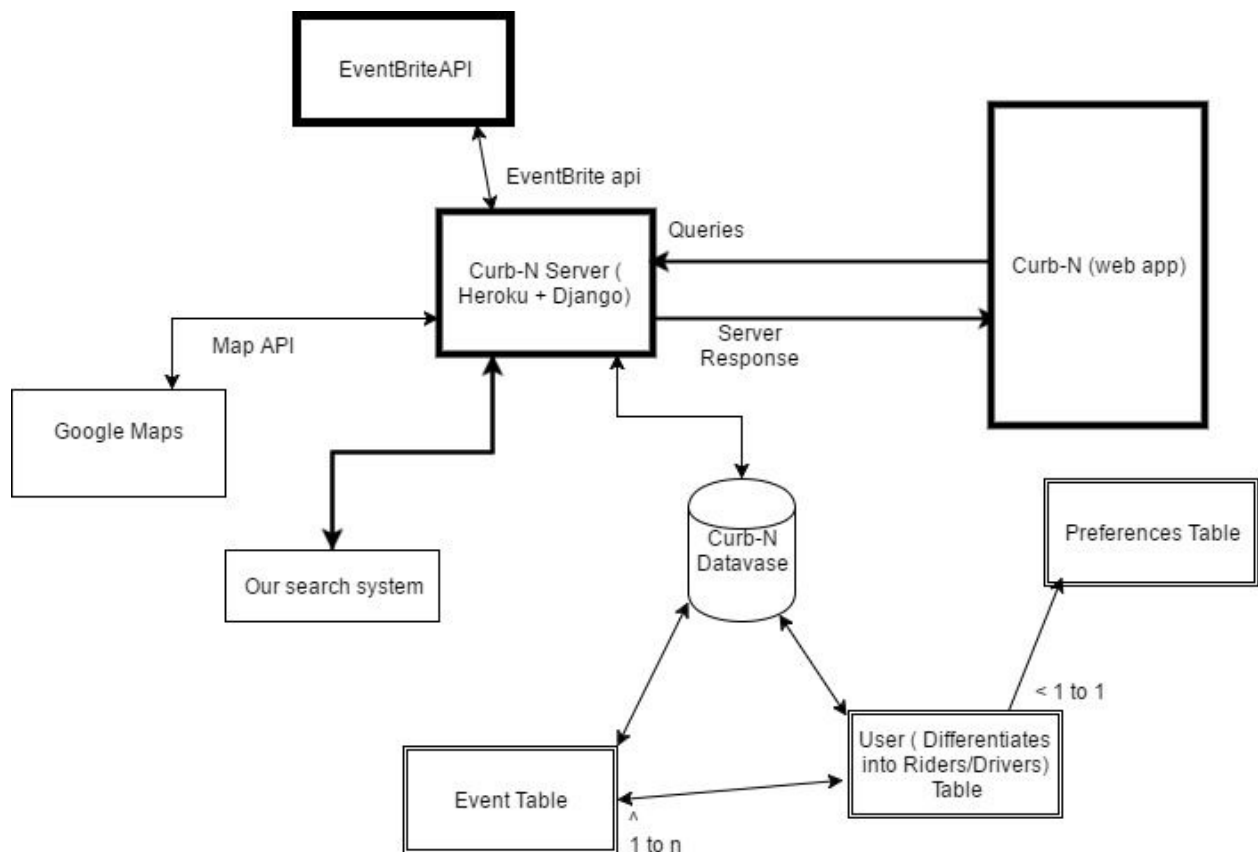
Functionality of our systems:

Curb-N applet(Web app)**:**

When it comes down to it, at its core, Curb-N is a ride sharing app tailored to make road-tripping a more personalized and easily accessible experience. General interaction with servers include queries to and responses from it. Objects returned to the app are notifications/updates, listing of current events/requests, and results from using our search system in the request creation process.

- To access Curb-N and all of its features, students are going to need to sign up with a university email in order to verify proof of enrollment.

- Once signed up, members will have the option to pick and customize what their interests are, as well as the kind of events they favor going to. In doing so, our search algorithms will provide a more personalized experience, recommending and notifying the user of events happening nearby that may interest them, as well as riders/drivers in the area who plan on road tripping to that specific event.

- Once the user has settled on an event they would like to attend, they will have the option to choose to attend the event as a driver or a rider.

- Now as a passenger, the user will have the opportunity to search for a driver whom they wish to ride with. Our app will layout all drivers who plan on driving to the event, as well as their ratings from past trips, and the amount of spaces left in their car.

- Once a driver has been requested, the chosen driver will have the opportunity to accept or deny the passenger's request for a seat. If accepted, both the driver and passenger will receive a confirmation notification along with the ability to message one another to figure out times and locations for pick ups and drop offs.
    - Anytime before the day of the scheduled event, a passenger may choose to cancel his or her reservation in a car, however there will be a cancellation fee tacked onto the passenger's bill.

- Another feature within Curb-N that would benefit drivers is the ability to pool gas money. Driver's have the option to set an agreed price for gas (our system plans on using a split cost analyzer to recommend a fair amount to charge) and all those passengers who chose to ride along will split the bill.

- Finally, once the trip has been made and all passengers have reached the destination safely, passengers have the chance to tip their driver.

- The more trips you take, the more personalized your experience with Curb-N becomes.

Curb-N server:

      The Curb-N server will the run search system algorithm on queried database info, as well as handle queries from the users and sending the response through a web browser. The server will house its own database containing the information of each users, their preferences, and events they will be attending, which is used to form a ranking/priority for pick ups. The google API will be integrated to the website so as to allow users to find addresses/routes/ see relevant information pertaining their search. The Curb-N server will also make use of the Eventbrite API to add/remove events from our database given a certain time period for each event.

Google Map API:

We intend to use the Google API to search for locations/event from the user input on the web app, as well as an intermediate to calculate the zip code of the user for use in our ranking algorithm. As of right now, the Google API will primarily be used as a medium to convey relevant information for a user's address search.

      Our script will send in a request for a detailed text search, which will return a place-json object. There will be another request sent that takes the place-object's reference id and return the postal_code that will be needed to calculate the best driver to rider ranking.

EventBrite API:

This API is used as a periodic event scrapper for our database after a few days or so, filling our database with relevant events given a certain category or subcategory and within a certain time frame (ie, events that are not expired). The Eventbrite API is called whenever the server received a query for an event that is not located in our pre-filled database, as a last resort.

Heroku: Platform as a Service

ISSUE: **team member working with this service is currently MIA, work is assumed to have been done. Website is not functional at the moment (and therefore, our app).**
We will be using Heroku as our web hosting and app management site, a free cloud service software. It also has access to a relational DBMS called Postgresql, which will be used to query responses from our databases. Our current website link is hosted as http://curbn.herokuapp.com/. The server was written in python, and uses the Django framework to handle our get and post requests from the website.

Implementation (**detail of components**):

We will talk about :

     Eventbrite retrieval process: Using EventBrite's developer API, we wrote a python script which would retrieve event related terms in a json format. Our request parameters ranged from keyword terms, categories, subcategories, date, time, and place.

We have acquired an Eventbrite developer key to which we can send requests for page events and to periodically update our database. Script will be included.

Google map geolocational requisition
     Partially implemented under Request page.
**Cost to drive integration via a gov funded site:**
     Not implemented

User login:

This is the login page. This is the first page users see when attempting to access the Curb-N website. To be able to login successfully, users are going to need a registered edu email and password. If a user hasn't been registered with the system, they can simply hit the "New User+" link that will take them to the Curb-N registration page.
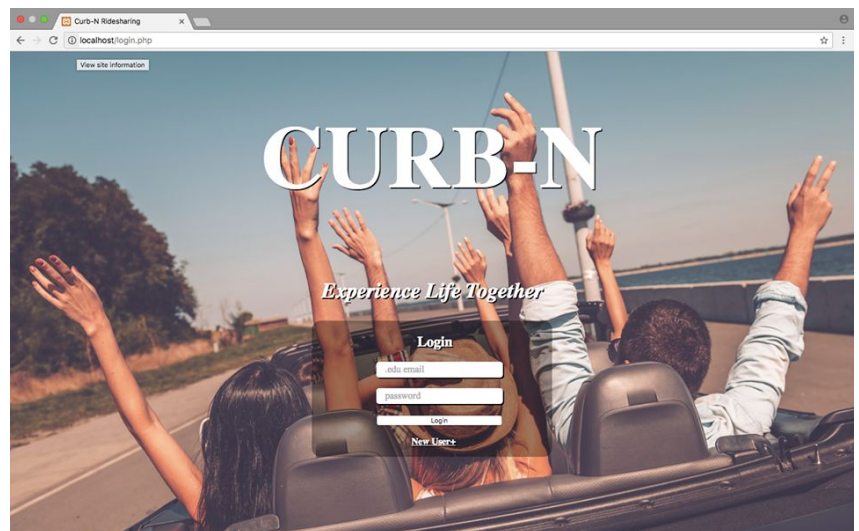
Registration page:
This is Curb-N's registration page. If a user is not registered with the system, here is where they would go to do so. In order to register successfully with the Curb-N website, the user must have a valid edu email. Then the user must validate their password by typing it in correctly, twice. There are no restrictions to passwords at the moment.
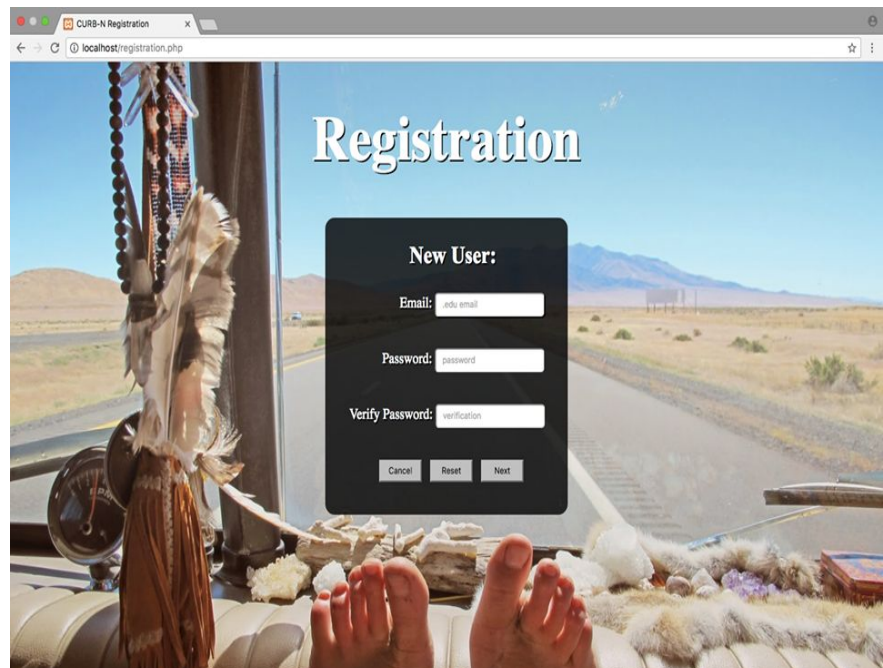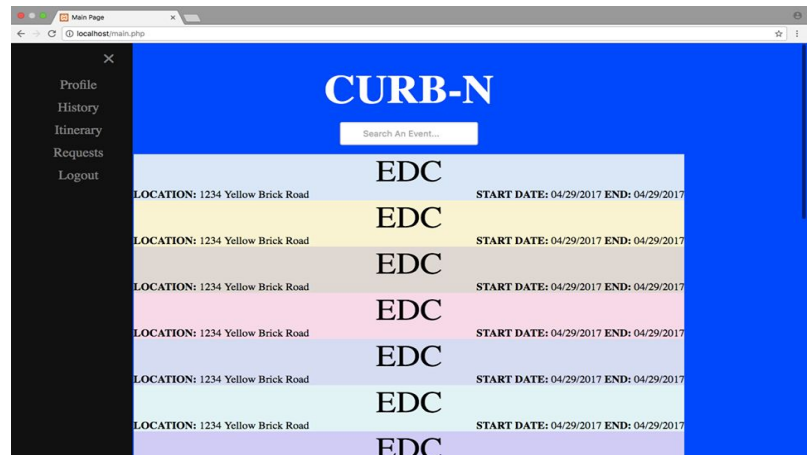
Information page

This is Curb-N's information page. This is how the system gets to know our users better so as to offer a more personalized experience in the future. Here we ask for some simple personal information such as name, zip code, phone number(optional). Users are also asked to specify at least 3 kinds of events they like go to, at least 3 kinds of topics of events they like go to, the farthest they'd go for an event, and finally, if they would like to be a driver or not. Again, that last question is to inform our system and allow for a more personalized user experience

Event page

This is the event page. Each event has its own event page that shows more information about the event. It shows the name, a picture and description of the event, the type and topic of the event, the location, as well as the starting and ending times. From here, users could hit the rider button taking them to a place to fill out an application to be a rider, or they may hit the driver button, allowing them to create a driver application for the event. They also have the option to hit the find others button which will lead them to a separate page with a list of riders and drivers going to the event with whom they may contact. Lastly, they may choose to hit the back button, ultimately returning them to the main page
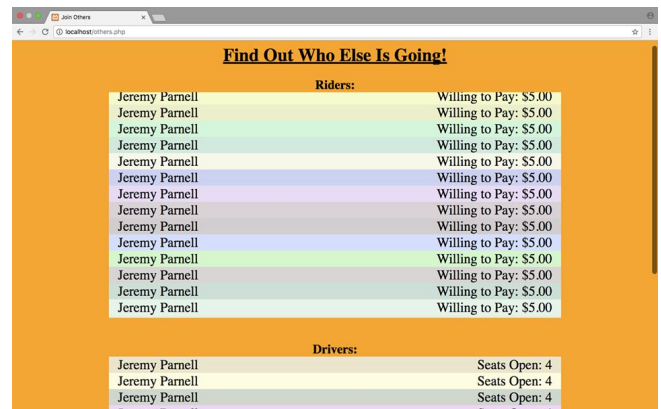
Main Search page

This is the main page. This is the page you would reach either after successfully logging in, or after successfully completing the registration process. On this page is a personalized feed, filled with system-recommended events (based on the user) going on in the users area of action, as well as a search bar to allow them to explore other event options. From this page users can access our side-bar navigation that lets them access their profile, their rider/driver history, future itineraries (this is where they would get notifications of upcoming events they have signed up to go to), their personal log of requests from other users, and the "logout" option.

Event specific page

This is the event page. Each event has its own event page that shows more information about the event. It shows the name, a picture and description of the event, the type and topic of the event, the location, as well as the starting and ending times. From here, users could hit the rider button taking them to a place to fill out an application to be a rider, or they may hit the driver button, allowing them to create a driver application for the event. They also have the option to hit the find others button which will lead them to a separate page with a list of riders and drivers going to the event with whom they may contact. Lastly, they may choose to hit the back button, ultimately returning them to the main page

Request page

This is the application to be a driver to an event. Here you have to state you're starting location as well as your destination. Lastly you need to specify how may free seats you have available in your car. Once submitted, the users name and information would be accessible from the event's find others page
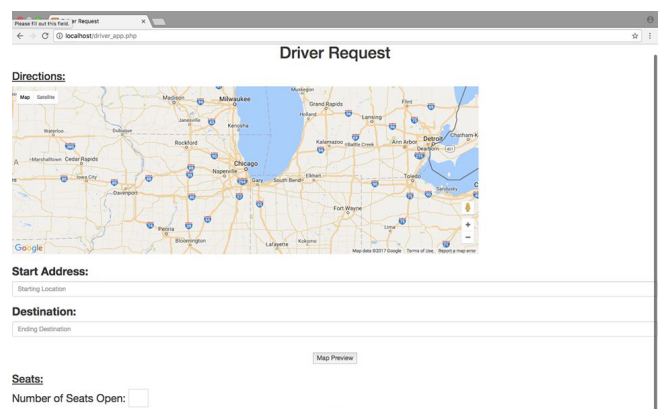
Curb-N server implementation
Done via Heroku. Status of operation: offline/nonfunctional

User Study and Evaluation:

This section is bare, due to the face that we were not able to acquire data from our database, nor test it on the website.

Currently Finished:

- This is what our team member modified when filling in our database: Eventbrite_category_retrieval_example.py

- Curb-N website templates (all the php files)

Conclusion:

As of now, Curb-N is still in development. The ride sharing feature we wish to implement has not been done yet, but it is supposed to include functionalities listed here: the application to be developed will focus on creating experiences by pairing passengers and drivers with a common goal together, as well as making the cost of rides cheaper, specifically since passengers are more often paired with drivers who are nearby.

Our information retrieval process will stress the importance of interests to events as well as a location of an event related to the user. This is done by using all relevant data collected, the most important weight when making this ranking is the proximity between a passenger and driver. This allows for a dramatic reduction in price. A keyword feature will also be used as the basis of our ranking when users give their preferences.

We will be using Heroku as our web hosting site/server as well as a platform to manage our application. The database will be covered through PostgreSQL, a free open source software for relational DBMS for information retrieval.

All queries will be done through the web app, and all responses received come from the Curb-N server. The server will make use of the Google API and EventBrite API to better enhance user experience as a result from our search engines.

Lastly, the reason that our group made the decision to accomplish this goal was because of the missed opportunities that occur everyday when people go to the same place or vicinity but each does so alone. The creation of a new encounter is invaluable along with a cheaper ride coupled with experiences of a lifetime.

Future:

Curb-N was built with the idea of scalability, similar to Facebook's initial launch when they only accepted @harvard.edu emails. The initial release for Curb-N will be available to students that have an edu email. As the user base increases, we will scale our servers accordingly as we begin to open up registration for any potential user. Possible implementation of new search features that would prioritize friends of friends for matching rides, giving driver and rider more things in common. Studies show that our social networks and those of our friends are generally found in the same sphere and Curb-N would, in the future, like to take advantage of this opportunity to unite even more of our userbase[2].

References:

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[7]Hitch a ride - About http://hitcharide.me/about/

[8] "Leicher, Andreas. "**Should I use Heroku or AWS? And what about hosting your own machines?**" A Medium Corporatiom, n.p, n.d. Web 20, Mar. 2017
https://medium.com/@aleicher/should-i-use-heroku-or-aws-3bfcd4706a36#.pkfgjg3lm