

Project Proposal

(Stage 1)

Team020 IShowCode

1. Project Title

FindMyPark NYC

2. Project Summary

FindMyPark NYC is a web application designed to help New York City residents find their most suitable parks based on their needs. From natural preserves to amusement parks, New York City provides a range of options for outdoor entertainment. However, existing navigation apps make it difficult for users to find parks with specific facilities they care about such as natural grass soccer fields or restrooms, and relying on physical park maps is often inconvenient and time-consuming.

Our app is built upon real datasets from NYC Open Data(park properties, athletic facilities, ...) and present in an interactive map format. This allows users to search and filter by a list of their preferences including distance, amenities, opening time.

3. Detailed Description of the Application

Park Profiles

- **What it does:** Provides a list of parks with their basic information including name, location, amenities, and business hours
- **Problem solved:** Provides a comprehensive overview of New York City to replace scattered park information maps applications.

Interactive Map

- **What it does:** An interactive map that enables toggling locations, viewing park details, and zoom in/out.
- **Problem solved:** Provides a clear visualization of geographical layout of maps in the city or in specific districts.

Park Recommendation System

- **What it does:** Recommend park choices to users by computing scores with user previous preferences
- **Problem solved:** Provides more accurate and faster park recommendations to users than free roam browsing

User Feedback (overall & feature-level)

- **What it does:** Users can submit ratings of parks/ specific amenities of parks,
- **Problem solved:** Helps the app reevaluates users' preferences for more accurate and personalized recommendation system

Preference Customization

- **What it does:** Users can input preference/hobbies labels such as sports (soccer, basketball) to the app system.
- **Problem solved:** The map takes these input labels into account to recompute scores and rerank park recommendations

4. Creative Components

Multi-factor Ranking Formula

- We will use NYC Open Data (sports fields, trails, greenery, nature preserves, etc.) to create a scoring formula.
- The formula includes basic weights (size, number of facilities), geographic factors (distance or walking time), and user preferences (chosen importance of each factor).
- When a user changes their preferences, the system will recalculate and re-rank results in real time.

User Preference Control

- Users can adjust sliders, weights, or tags to show what they care about most (e.g., “green space > sports facilities”).
- These values directly affect the formula and update recommendations instantly.
- Over time, the system can learn from feedback and user activity to improve preference modeling.

Interactive Visualization

- Recommendations will not only appear as a list but also as visual elements on a map.
- We plan to add heatmaps or charts (like radar/spider charts) to show how each park scores across different categories.
- This gives users a clear explanation of why a park is recommended and helps them compare parks easily.

Cross-Dataset Integration

- In addition to NYC Open Data, we can combine Google Maps API data (e.g., travel time, peak hours).
- The system can then make smarter suggestions such as:
- “Park A matches your interests but is very crowded today, consider Park B.”
- “Park C has the best facilities, but traffic is heavy, so Park D may be faster to reach.”

Technical Challenges

- Complex multi-table queries and real-time recalculation of ranking formulas.
- Efficient API design to handle user preference changes without delays.
- Integration of interactive maps (Leaflet/Mapbox/Google Maps API) with dynamic updates.
- Data fusion of static datasets (NYC Open Data) and dynamic APIs (Google Maps), which requires careful cleaning, caching, and performance optimization.

5. Usefulness

Why is this application useful?

Many New York City residents want to find parks that match their specific needs, such as a quiet place to relax, a trail for running, or a soccer field with natural grass. Existing map apps focus on navigation but do not give detailed information about park facilities or user-centered

recommendations. Our application is useful because it combines open data, user preferences, and interactive tools to help people quickly discover the best park for them.

What are the basic functions of the web application?

- Show park basic information such as name, location, size, and available facilities.
- Provide an interactive map to browse and explore parks visually.
- Allow users to search and filter parks based on amenities, activities, or distance.
- Recommend parks using a ranking formula that considers both data and user preferences.
- Let users give feedback and ratings on parks or specific facilities.
- Personalize the recommendation score for users about each park.

What simple and complex features does it include?

- Simple features: Viewing park details, searching by name or location, and browsing the interactive map.
- Complex features: Personalized recommendations using weighted formulas, dynamic updates when user preferences change, and integration of multiple datasets (NYC Open Data + Google Maps API).

Are there similar websites/applications? If so, what are they, and how is yours different?

Some existing apps like Google Maps or Yelp show park locations and basic reviews. However, they do not focus on detailed park facilities (e.g., number of trails, type of sports fields) and do not provide a customizable ranking system or personalized recommendation system to users. Our system is different because it:

- Uses real open datasets from NYC Open Data to ensure accurate and complete information.
- Lets users control their preferences and adjust how parks are ranked.
- Offers interactive visualizations to make recommendations transparent and easy to understand.
- Combines static park data with dynamic information (e.g., distance, travel time) for smarter results.

6. Realness (Datasets)

Parks Properties

- Sources: https://nycopendata.socrata.com/Recreation/Parks-Properties/enfh-gkve/about_data
- Formats: CSV
- Data Size:
 - Rows: 2054
 - Columns: 34
- Information: This dataset identifies property managed partially or solely by NYC Parks, which includes park name, unique identification number, size, type, and water front.

Athletic Facilities

- Sources: <https://data.cityofnewyork.us/dataset/Athletic-Facilities/qppi-ckmp>
- Formats: CSV
- Data Size:
 - Rows: 6921
 - Columns: 45
- Information: This dataset contains facilities that were designed specifically with sports including both facilities that can be permitted for athletic activity and some fields or courts that are not available for permitting.

Directory of Nature Preserves

- Sources: https://data.cityofnewyork.us/Recreation/Directory-of-Nature-Preserves/7yhi-h8kc/about_data
- Formats: XML/CSV/JSON
- Data Size:
 - Rows: 51
 - Columns: 45
- Information: This dataset identifies areas in NYC Parks with the most significant natural habitat, including information about name and type of habitats.

Parks Trails

- Sources: https://data.cityofnewyork.us/Environment/Parks-Trails/vjbm-hsyr/about_data
- Formats: CSV
- Data Size:
 - Rows: 6787
 - Columns: 11

- Information: This dataset captures the location of paths or trails in designated Forever Wild areas of NYC Parks, including trail name, corresponding park name and id, approximate width, class, and difficulties.

Google Map API

- It will provide the map and location information needed in our app.

7. Functionality (CRUD + Search)

- A clear list of what the application delivers:
 - **Create:** What type of data can a user add?
 - **Read:** What data can a user search or view?
 - **Update:** What data can a user modify?
 - **Delete:** What data can a user remove?
- User interaction scenarios (e.g., submitting forms, searching through a search bar, updating profiles, etc.)

Create :

- **User Accounts:** A new user can **create** their personal account when using the app for the first time
- **User Reviews:** Users can **create** reviews at anytime(after have been to a certain park) in the page of a certain park, which can include:
 - overall star rating
 - text comment
 - specific ratings for key features like "Trail Condition," "Environment," or "Suitable for [a certain type of sports]."
- **Profiles:** Users can **create** new personal information and preferences at anytime in their profile page

Read (R):

- **Search and Filter Parks:** All users can **read, search for, filter park information** when they are using the app at the main page
- **View User Reviews:** All users can **read** the reviews, general ratings, detailed information including park's location, list of facilities, photos, hours, and

recommendations for specific activities left by other members of the community for any park when selecting a certain park's page

Update (U):

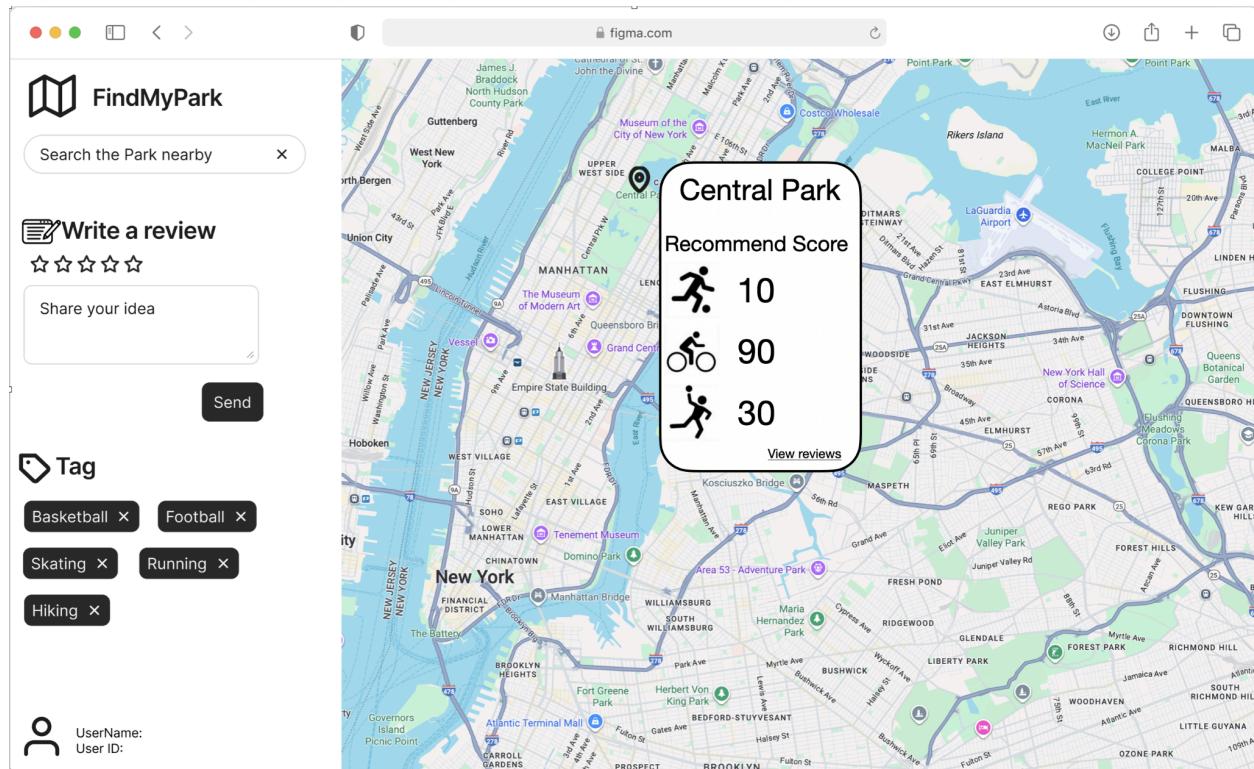
- **User Reviews:** users can **update** their own previously submitted reviews at anytime at the certain park page or their own reviews management page
- **Profiles:** users can **update** information and preferences to their profile at their profile page

Delete (D):

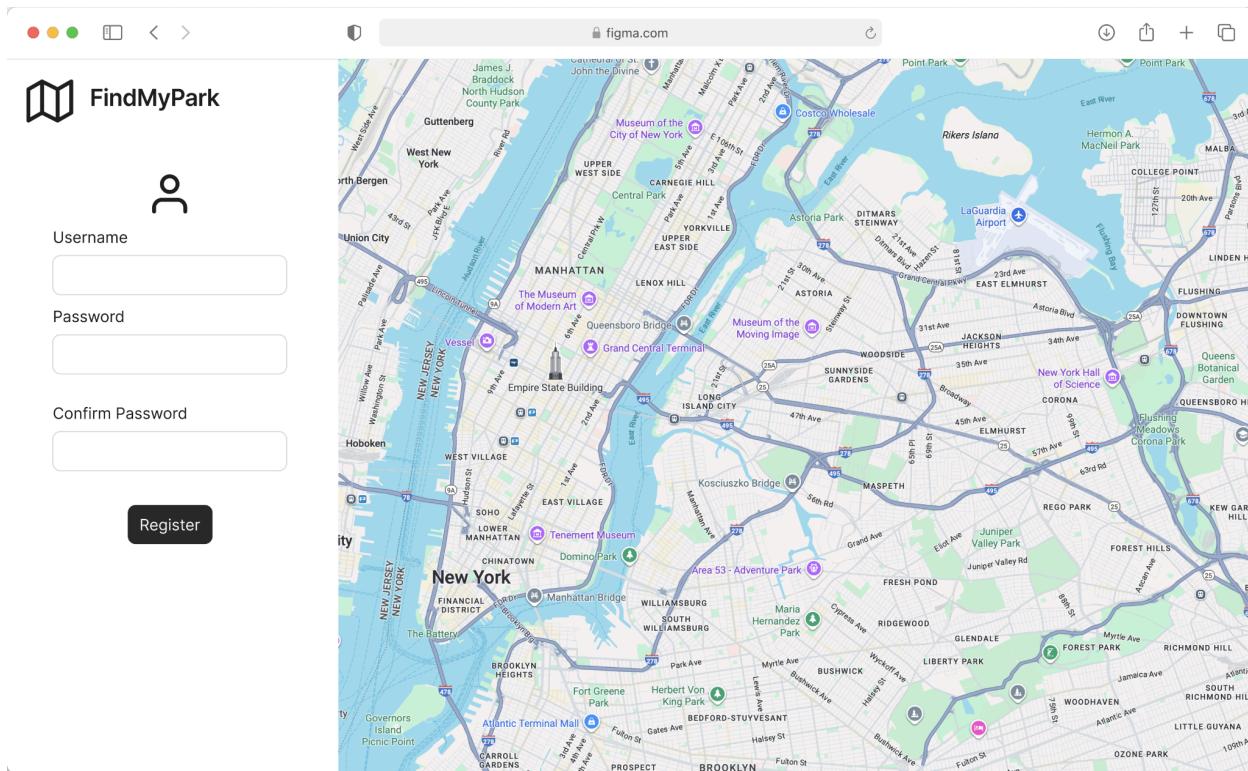
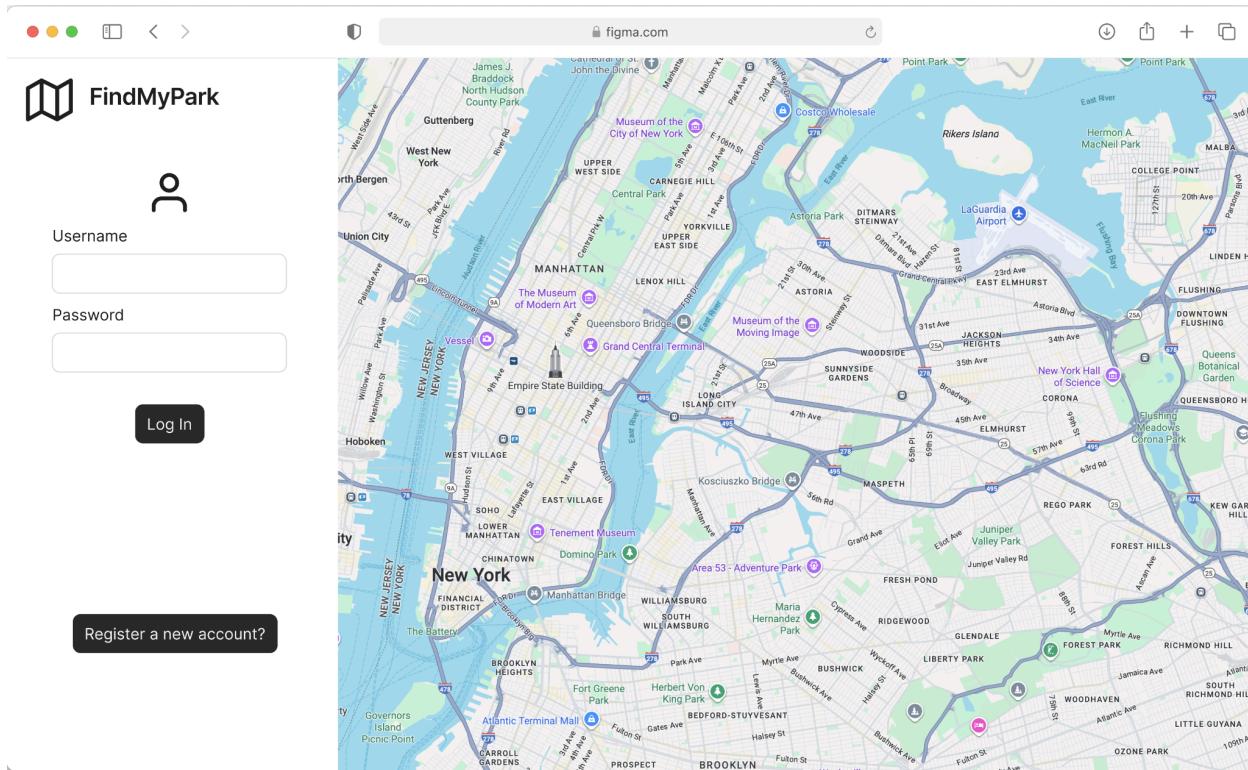
- **User Reviews:** users can **delete** their own reviews at the certain park page or their own reviews management page
- **Preference Profiles:** users can **delete** information and preferences from their own profile at any time
- **User Account:** users can **delete** their entire account, which will remove all associated data, including their reviews and saved preferences at the settings page

8. Low-Fidelity UI Mockup

Main Page



User Interface



Recommendation System

The screenshot shows a user interface for a recommendation system. At the top left is the logo "FindMyPark". Below it is a search bar with the text "Hiking" and a close button "X". To the right is a large map of New York City, highlighting various parks and landmarks. On the left side of the map is a sidebar containing a list of parks with their names and scores:

Park	Score
Central Park	98
Highline Park	89
Governors Island	80
Prospect Park	70
Highland Park	65

At the bottom left, there is a user profile icon with the text "UserName: User ID:".

Describe the Park

The screenshot shows a user interface for describing a park. At the top left is the logo "FindMyPark". Below it is a search bar with the placeholder "Search the Park nearby" and a close button "X". To the right is a map of New York City. A callout box is overlaid on the map, highlighting Central Park with the following text:

Central Park
★★★★★
Central Park is a vast urban oasis in the heart of Manhattan, offering scenic landscapes, lakes, and cultural landmarks for millions of visitors each year.

On the left side of the map, there is a "Write a review" section with a 5-star rating and a "Share your idea" input field with a "Send" button. Below this is a "Tag" section with categories: Basketball (X), Football (X), Skating (X), Running (X), and Hiking (X). At the bottom left, there is a user profile icon with the text "UserName: User ID:".

9. Project Work Distribution

Groupmates: Solomon, Michael, zjy, Henry

Frontend development ([React.js](#))

Work by: (Solomon, Michael)

- Build the user interface in [React.js](#)
- Implement interactive map with [Google Map API](#)
- UI implementation
 - Search bar with autocomplete for park names or address
 - Tag system for filtering (e.g., "Basketball", "Playground", "Dog-Friendly")
 - User preference sliders (e.g., facility quality)
 - Park detail page, facilities list, and user ratings
- Define a design system (colors, typography, layouts) and apply across all pages

Backend development ([Node.js](#)+Express)

Work by: (Solomon, Henry)

- Park information system
 - Store and [serve metadata](#) (location, size, facilities, sports support)
 - API endpoints for search, filter, and retrieval
- Park recommendations system
 - Implement ranking algorithms based on user preferences.
 - Personalized suggestions (e.g., nearest park with tennis + playground).
- User management
 - Login/registration passwords
 - User profiles storing preferences and favorites.
- Feedback & reviewing system
 - Endpoints to submit, edit, and delete reviews.
 - Retrieve aggregated ratings for each park

Database design/management

Work by: (zjy, Michael)

- Design relational schema in MySQL
- Design schema: parks, sports, users, feedback, favorites
- Manage database migrations and indexes.
- Ensure secure and efficient integration with backend APIs
- Data Integration:
 - Load real-world park dataset (NY open data with park)

- Normalize data for consistency and avoid redundancy

Workflow management

Work by: (zjy, Solomon)

- Manage program processing and ensure smooth communication between frontend and backend teams
- Version Control
 - Git/GitHub for collaborative development
 - Enforce code review & pull request process
- Testing
 - Unit testing (backend APIs, frontend components)
 - Integration testing (end-to-end workflows)
 - Bug tracking and resolution

Documentation/Report writing

Work by: (Henry, Michael)

- Write Stage deliverables (proposal, reports, README.md)
- Ensure consistency across technical documentation and project reports
- Coordinate peer review of all written submissions

Teammates:

- Yanqin Jiang (Solomon) yanqiny2@illinois.edu
- Kaiyang Teng (Michael) kteng4@illinois.edu
- Jieyi Zhao (zjy) jieyi3@illinois.edu
- Hengrui Ren (Henry) hengrui6@illinois.edu

09/17/2025