Team Name: Localis

Problem Statement: EstateEval: Property Evaluation Tool

Team Size: 1

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Introduction

EstateEval is a web application that harnesses Google Maps APIs to help users assess potential properties. It calculates a Proximity Score by measuring the distances to hospitals and transportation hubs and a Quality Score based on air quality,crime rates and various factors. Users select locations on a Google Map, receiving immediate scores, aiding in informed real estate decisions. This application seamlessly integrates data and maps for a user-friendly and data-driven property evaluation tool.

Key Features

This end-to-end project offers two key features:

1.Proximity Score: Users can select a location on the map using Google Maps. The application then calculates a proximity score by measuring the distances to the nearest hospitals and transportation facilities, such as bus stations and metros. This score is determined by averaging the distances to these essential services, facilitating an informed assessment of the property's convenience and accessibility.

2.Quality Score: The application evaluates the quality of the selected location by considering vital factors such as air quality index, crime rates, etc. It calculates a quality score by accurately normalizing and averaging the scores accordingly. This score aids potential property buyers or investors in making more informed decisions regarding the suitability and desirability of a location.

Google Maps Platform

APIs and SDKs used

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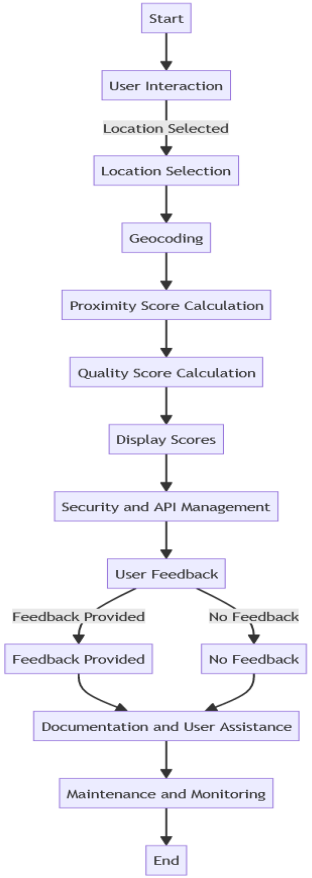
1.Google Maps JavaScript API: This API is used to display the interactive map on the web page, allowing users to select locations and interact with the map interface.
2.Google Maps Geocoding API: It helps convert user-selected locations (addresses) into latitude and longitude coordinates, which are essential for calculating distances and accessing location-specific data.
3.Google Places API: This API is crucial for finding nearby hospitals and transportation facilities (bus stations, metros) based on the latitude and longitude coordinates obtained from the Geocoding API.
4.Google Maps Distance Matrix API: It helps calculate the distances between selected locations and nearby facilities, allowing us to measure proximity accurately.
5.Google Maps JavaScript SDK: This SDK is used to enhance the visual aspects and interactivity of the map on the web page.
6.Google Air Quality Index API: This API is used to measure the Air Quality Index of the Area, allowing us to calculate the quality score accurately

Google Maps Platform

Process Flow



1.Start: The process begins.
2.User Interaction: Users engage with the application and select a location.
3.Location Selection: The chosen location is captured for evaluation.
4.Geocoding: The selected location is converted into latitude and longitude coordinates.
5.Proximity Score Calculation: Distances to the nearest hospitals and transportation facilities are computed.
6.Quality Score Calculation: Air quality, Crime rate data and various metrics are used to calculate the Quality Score.
7.Display Scores: Proximity and Quality Scores are shown to the user.
8.Security and API Management: Secure access to Google Maps APIs is ensured.
9.User Feedback: Users can provide feedback on the scores.
10.Documentation and User Assistance: Guidance and assistance for users are available.
11.Monitoring and Maintenance: The application is continuously monitored and maintained.
12.End: The process concludes.

Business Logic

1.User Interaction:

1. Users access the application and interact with an embedded Google Map.
2. They select a location on the map, indicating their area of interest for property evaluation.

2.Location Processing:

1. The application uses the Google Geocoding API to convert the user-selected location (address) into latitude and longitude coordinates, which serve as the basis for subsequent calculations.

3.Proximity Score Calculation:

1. The application leverages the Google Places API to find the closest hospitals, bus stations, and metros based on the obtained coordinates.
2. It calculates the distances to these facilities using the Google Maps Distance Matrix API.
3. The Proximity Score is determined by averaging the distances, providing a measure of convenience and accessibility.

4.Quality Score Calculation:

1. The application gathers data on air quality for the selected location using the Google Maps Air Quality Index API.
2. It also uses a predefined crime rate and various other factors value to factor into the Quality Score calculation. The Quality Score is calculated by normalizing and averaging the air quality index and the various other data, aiding users in assessing the desirability of the location.

Business Logic

5.Data Presentation:

1. The calculated Proximity Score and Quality Score are displayed to the user on the web page, providing them with easily understandable insights.

6.User Feedback and Assistance:

1. Users have the option to provide feedback on the scores and report any issues.
2. Documentation and user assistance are available to guide users in effectively utilizing the tool.

7.Security and Maintenance:

1. The application ensures the secure management of API keys and user data.
2. Continuous monitoring and maintenance are carried out to ensure the application's reliability and accuracy.

8.Conclusion:

1. The application concludes the property evaluation process, leaving users with valuable information to aid in their real estate decisions.

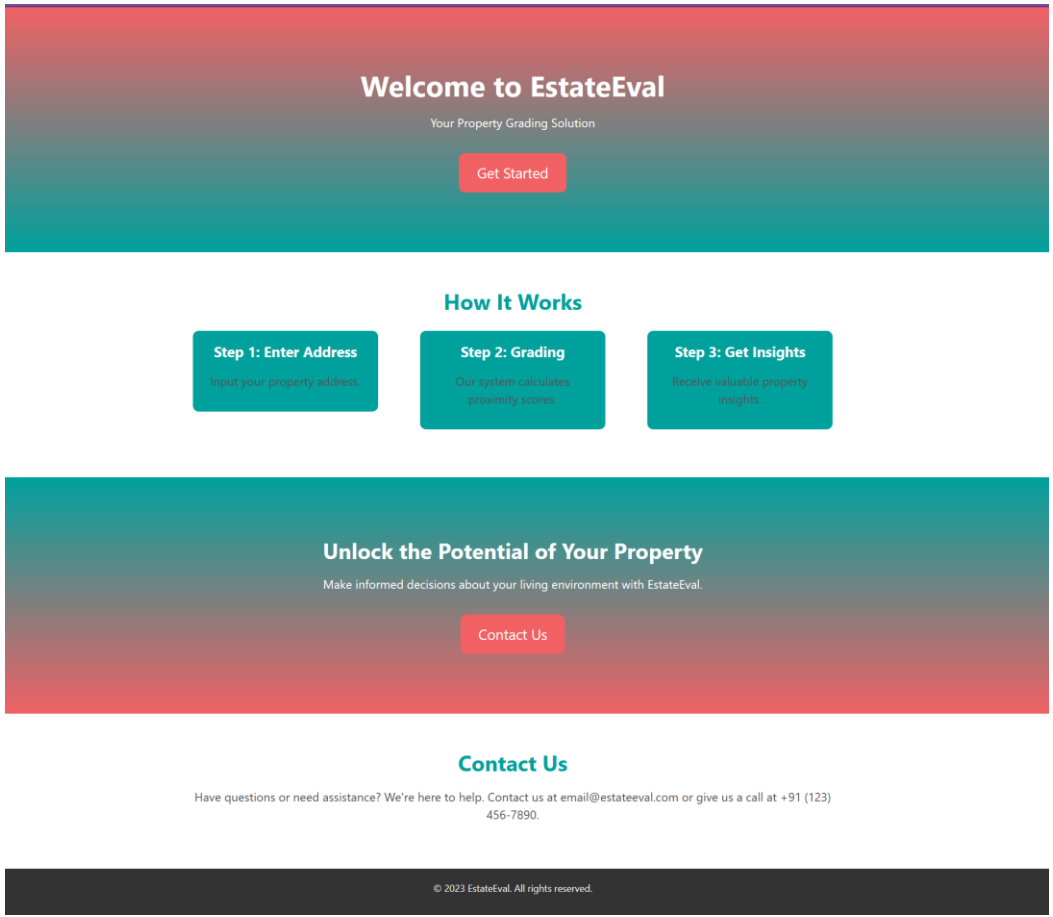
Estimated Cost

Assuming a 1000 requests for all the APIs used per month.

APIs and SDKs used	Cost per Month for 1000 Requests
Google Maps JavaScript API	7$
Google Maps Geocoding API	5$
Google Places API	17$
Google Maps Distance Matrix API	7$
Google Maps JavaScript SDK	7$
Google Air Quality Index API	5$
TOTAL:	**$48**

Google Maps Platform

Implementation



This is the landing page of the web application, it gives a brief overview of how it works and how to use the application.

To use the Estate Evaluator App, you can navigate to it by clicking on Get Started.

Implementation

Enter an Address

Empire State Building, West 34th Street, New York, NY, USA

Estate Grading

Emergency Services Proximity Scores

Hospital Name: Healthy Living Longer
Distance: 0.02 km
Proximity Score: 99.98

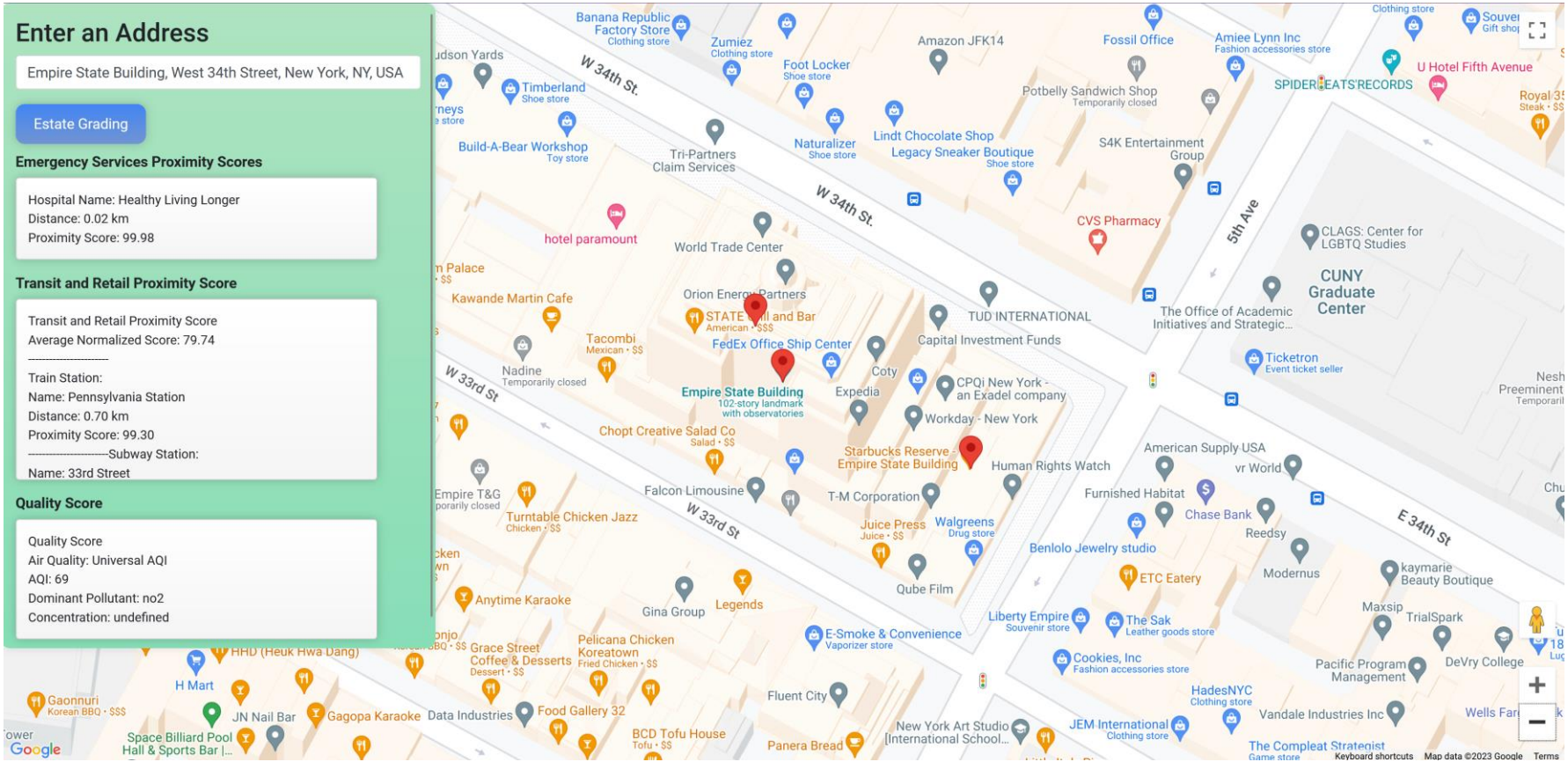
Transit and Retail Proximity Score

Transit and Retail Proximity Score
Average Normalized Score: 79.74

Train Station:
Name: Pennsylvania Station
Distance: 0.70 km
Proximity Score: 99.30
----------Subway Station:
Name: 33rd Street

Quality Score

Quality Score
Air Quality: Universal AQI
AQI: 69
Dominant Pollutant: no2
Concentration: undefined



Important Links

Github Submission: https://github.com/hack2skill/Code-with-Google-Maps/pull/9

Video: https://www.youtube.com/watch?v=jw8aptkfuBc

</Code> with Maps

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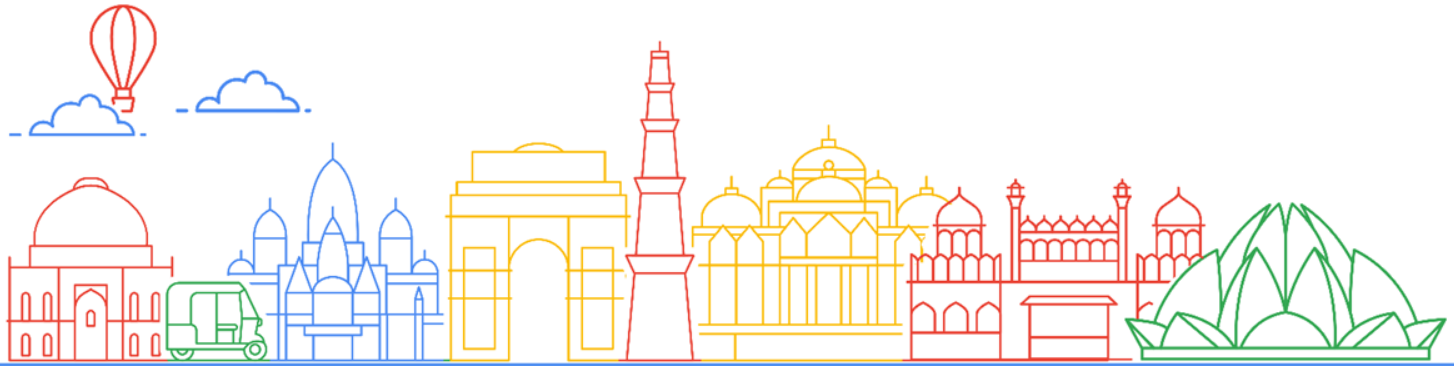

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