Software Requirements Specification (SRS)

Project Name: Lenskart Store Feasibility Prediction System

Date: July 12, 2025

1. Introduction

The Lenskart Store Feasibility Prediction System is a machine learning-powered application designed to assess the feasibility of opening new retail stores at a given location in India. It uses geospatial data, retail surroundings, and urban infrastructure to compute a feasibility score, aiding in strategic retail expansion decisions.

2. System Overview

This system leverages Python, Flask, scikit-learn, and OpenStreetMap APIs to process location data and estimate a feasibility score using a Random Forest Regressor model. A user-friendly web interface is provided for input and interaction.

3. Functional Requirements

- Accepts address or coordinates as input
- Extracts relevant geospatial and Points of Interest (POI) features
- Predicts feasibility score using ML model
- Displays results in a web UI
- Saves data for further analysis

4. Non-Functional Requirements

- Performance: Fast geocoding and prediction (<2 seconds avg)
- Scalability: Modular design for dataset expansion
- Reliability: API and model logging with graceful failure handling
- Usability: Responsive and intuitive web form

5. Technologies Used

- Python 3.10.14
- Flask (API backend)
- scikit-learn (ML model)
- joblib, pandas, numpy
- HTML/CSS/JavaScript (Frontend)

- geopy, ratelimit, requests
- OpenStreetMap APIs (Nominatim & Overpass)

6. Dataset

The dataset consists of 500+ entries with attributes like optical stores within 1km, traffic count, POI counts, locality type, rent, site area, etc., compiled and expanded using Overpass API and manual entries.

7. System Architecture

1. User inputs address or coordinates
2. Flask API calls pipeline for geocoding, POI extraction, and scoring
3. ML model predicts score
4. Score is returned and displayed in frontend

8. Future Improvements

- Integrate more robust POI classification (e.g., malls vs local markets)
- Add support for dynamic traffic estimation
- Extend model for feasibility classification instead of regression