🌱 AI Project Proposal Form

Project Title:

ছাদ কৃষি: AI-Based Rooftop Plant Recommendation & Care System

1. Project Motivation:

Urban environments often lack greenery, but rooftops offer a valuable space for sustainable gardening. However, not everyone knows what plants are suitable for their specific roof conditions. Factors like sunlight, location, and user intention (vegetable/flower/shade) significantly impact plant selection and care.

RoofBot aims to solve this by using basic Machine Learning and AI to analyze rooftop conditions and generate personalized plant recommendations along with a smart care plan.

2. Project Description:

Core Idea:
An AI-powered Python-based application that:

- - Analyzes rooftop location and sunlight
- - Recommends plants suitable for that roof
- - Generates a weekly/monthly care plan for each plant

3. Key Features:

Feature	Description
📍 Rooftop Analyzer	Uses user input (location, orientation, area, purpose, sunlight)
🌿 Plant Recommender	Filters suitable plants using rule-based or ML models
📅 Smart Care Plan Generator	Auto-generates watering, fertilization, pruning, and pest control schedules
📊 Plant Database	CSV-based data with sunlight, soil, water, and season info
🌐 Flask Web App	Provides API to interact with the system via HTTP GET

4. Technology Stack:

Layer	Tools Used
Programming	Python 3
Web Framework	Flask
Data Handling	Pandas, JSON, CSV
ML Algorithm	Decision Tree (optional) / Rule-Based Logic
Frontend (Optional)	HTML5 / Bootstrap
APIs (Future)	Weather API, Notification Service

5. Modules Overview:

1. app.py: Flask entry point

2. recommender.py: Takes user input & recommends plants

3. care_plan.py: Generates a detailed care schedule

4. plant_data.csv: Dataset with plant needs

5. user_input.json: Sample user profile for roof conditions

6. Expected Output:

- - List of suitable plants (e.g., Tomato, Tulsi)
- - Weekly/monthly care plan per plant
- - API endpoint /recommend returns recommendation + care plan in JSON

7. Future Enhancements:

- - Integration with Weather API for dynamic care advice
- - Leaf image-based disease detection using CNN
- - Interactive UI with drag-and-drop rooftop garden layout
- - Push Notifications for watering/fertilizing reminders
- - IoT integration for smart sensors

8. Target Users:

- - Urban gardeners
- - Eco-friendly home/office owners
- - Students & botany/AI enthusiasts
- - Smart city developers

9. Data Collection, Processing, and Usage Plan

Data will initially be collected from publicly available agricultural sources such as government databases, botany textbooks, and online horticultural repositories. This dataset will include attributes like plant name, light requirement, soil type, seasonal suitability, water and fertilizer needs.

Processing involves cleaning the data (handling missing values, normalization), encoding categorical values if ML is used, and organizing it in structured CSV/JSON formats. The AI model then maps user inputs to plant profiles by comparing environmental needs, and finally generates actionable care plans. The system can be continuously improved by collecting user feedback or integrating real-time weather APIs in future versions.