**Project Title** – NutriPlant: AI-Based Plant Disease and Nutrient Deficiency Diagnosis

**Abstract**

**Project Objectives**

NutriPlant is a smart tool that uses AI to detect plant diseases and nutrient deficiencies from leaf images. It helps farmers, gardeners, and plant lovers by quickly identifying problems, suggesting treatments, and providing useful information to keep plants healthy and thriving.

**Methodology**

The project uses AI to study plant leaf images and detect diseases or nutrient deficiencies. Users can upload photos through a Flutter-based mobile app, which sends them to a backend system powered by Flask and a trained Keras model. The model analyzes the images and provides a diagnosis. Firebase handles user logins, while extra features like an expert chat (using the Gemini API) and a plant management section (MyPlantsScreen) make the app more useful and engaging.

**Key Findings**

* The AI model effectively classifies plant diseases and nutrient deficiencies with high accuracy.
* The integration of Firebase authentication provides secure user management.
* The expert chat feature allows users to receive AI-generated guidance.
* The MyPlantsScreen feature enables users to track their plants and set reminders.

**Step-wise Solution Approach**

**Step 1**: Collect and preprocess a dataset of plant leaf images for training the AI model.  
**Step 2**: Train a deep learning model (CNN-based) using Keras to classify plant diseases and deficiencies.  
**Step 3**: Develop a Flask API to serve predictions from the trained model.  
**Step 4**: Build a Flutter-based mobile app for image uploads and displaying results.  
**Step 5**: Integrate Firebase authentication for user management.  
**Step 6**: Implement additional features like expert chat and MyPlantsScreen for enhanced functionality.  
**Step 7**: Optimize UI/UX and test the app for performance and accuracy.

**Reference**

11. Mohanty, S. P., Hughes, D. P. & Salathé, M. Using deep learning for image-based plant disease detection. *Front. Plant Sci.* **7**, (2016).

**Team**

1. **Raghav Goel**