Select week number - Week 1 (2nd June - 8th June)

List the tasks completed this week*

June 1: Conducted initial brainstorming session to identify gaps in existing agricultural solutions. Researched competitors (SoilSens, CropIn, Fasal, etc.) and explored datasets (ICRISAT, FAO, Google Earth Engine, IMD, Sentinel, TNAU). Identified the need for a Tamil Nadu-specific solution and considered focusing on pest management.

June 2: Submitted NDA declaration as per hackathon requirements.

June 3: Split up work between us to explore datasets (ICRISAT, Sentinel, TNAU, etc.) for problem statement ideation. Discussed potential ideas during a late-night meeting, including Farmigo (hyperlocal delivery from farmers to consumers) proposed by Harshavardhan.

June 4: Connected with Saran Raj, an agricultural engineering expert, for insights on farmer class structure (e.g., marginal, small, big farmers), cropping patterns (hydroponics, aquaponics), and challenges (climate change, limited AI impact). Brainstormed ideas like GreenShield (pest classification) and AgroGuardian (crop stress detection). Decided to combine pest detection with supplier delivery (inspired by Farmigo but reversed: suppliers to farmers).

June 5–6: Researched datasets for pest detection and crop stress (e.g., PlantVillage, Pestopia, Crop Pest and Disease Detection on Kaggle). Finalized focus on leaf damage images for pest-induced stress detection, with additional features including weather information and pesticide recommendation.

June 7: Abhinav developed the initial project proposal for AgriSaarthi, a chatbot focused on pest diagnosis, pesticide recommendations, and supplier connections, with additional utility features like weather alerts, scheme notifications, and motivational messages.

June 8: Held a team meeting to finalize AgriSaarthi as the project, aligning with the Pest Management theme.

Link to Codebase / Notebook / Dashboard *(Provide a shared GitHub, Colab, or Drive link)*

No codebase has been developed yet, as the week focused on ideation and planning. A GitHub repository will be initialized on June 9, 2025, as per the Week 2 plan. A placeholder link will be shared in the next report once the repository is set up.

Progress Towards Final Goal *(Describe how this week's work contributed to your project. Mention milestones or percentage completion.)*

This week's work laid the foundation for AgriSaarthi by identifying a high-impact problem (pest management for Tamil Nadu farmers) and finalizing the project scope. We conducted extensive research on existing solutions, consulted an expert, and explored datasets, which helped us refine our focus on an AI chatbot for pest diagnosis, supplier connections, and farmer support. The project proposal was drafted, marking a clear direction for development. We estimate this week's efforts contribute to ~10% of the overall project, as we've completed the ideation and planning phase.

Challenges faced *(Mention any technical, data, or teamwork-related challenges you encountered.)*

Challenges Faced

- **Data Availability**: Lack of extensive real-time, annotated pest and stress images from Tamil Nadu farms.
- **Multilingual Support**: Need for Tamil-based chatbot interface.
- **Weather & Scheme Data Dependence**: The accuracy of advisories depends on the quality of external APIs or government databases, which may be outdated or inconsistent.
- **Dataset Limitations**: Many datasets (e.g., ICRISAT) are outdated (up to 2016).
- **Domain Complexity:** Insights from Saran Raj highlighted that AI in agriculture may only yield 60% accuracy due to climate change and ground realities, requiring us to balance AI with practical solutions.
- **Scope Definition**: Balancing novelty with feasibility was challenging, as existing solutions (e.g., CropIn, Fasal) already cover similar domains. We addressed this by focusing on Tamil Nadu-specific pest management and emotional support features.
- **Team Coordination**: Aligning ideas across the team took time, as multiple concepts (Farmigo, GreenShield, AgroGuardian) were proposed before converging on AgriSaarthi.

Support required *(Clearly specify if you need help or guidance on any issue.)*

- Suggestions on optimizing a chatbot for low-latency image processing and multilingual support (Tamil).
- Access to curated datasets from Tamil Nadu or relevant partnerships (TNAU, MSSRF) and API access.
- Validation support on pest classification pipeline or AI model.
- Mentorship on integrating ML models with low-bandwidth communication platforms.

Time Spent This Week (in hours)*

(Provide an approximate number, with optional breakdown)

Total: ~18 hours

- June 1: Brainstorming and competitor research – 3 hours
- June 2: NDA submission – 30 mins
- June 3: Dataset research and team meeting – 4 hours
- June 4: Expert consultation (Saran Raj) and idea refinement – meeting (2 hrs 30 mins, idea - 2 hrs)
- June 5–6: Dataset exploration and multimodal research – 2 hrs
- June 7: Drafting AgriSaarthi proposal – 2 hours
- June 8: Finalizing project scope – 2 hours

Plan for the coming week*

(List your goals and planned deliverables for the next week.)

Plan for the coming week

- **June 9–15 (Week 2)**:
    - Initialize a structured GitHub repository(/src, /notebooks, /docs, /data, README.md).
    - Download and preprocess datasets (PlantVillage, Pestopia, Crop Pest and Disease Detection).
    - Build a baseline deep learning model for pest classification (notebooks/training.ipynb).

    - Draft initial chatbot workflow (src/chatbot.py).
    - Document problem statement, architecture design, and weekly progress (docs/report.md).
    - Submit Week 2 report on June 15, 2025.

Data Pipeline

- Annotate images if the dataset is not readily available.
- Script for cleaning and preprocessing plant stress datasets.

Model Prototyping (Stage 1)

- Train initial pest classification model and fine-tune on leaf datasets.

Chatbot (Prototype Phase)

- Start basic integration using Twilio/Gupshup with image input support and dummy replies.

Supplier Database

- Design schema and begin sourcing dummy data (location, contact, inventory).

Mentor Review

- Schedule a session with Mr. Johanan Joy Singh for technical & validation feedback.

Problem Statement
Day by day, more individuals are entering agriculture without a proper agricultural background or formal training. These new-age farmers-often youth returning to rural areas or professionals shifting careers-struggle with making informed decisions about crop management, pest control, and the use of inputs. At the same time, even traditional or experienced farmers face challenges in identifying emerging pests and selecting the appropriate pesticides from a growing and complex market. Limited access to expert advice and a lack of information about nearby input suppliers often lead to delayed or incorrect treatment, reducing crop yield and increasing costs. Additionally, many farmers miss critical updates on weather conditions, government schemes, and subsidies due to the absence of real-time, accessible communication platforms. These gaps, coupled with rising financial pressure and social isolation, have contributed to increasing levels of farmer distress and mental health issues.

AgriSaarthi addresses these challenges through a web-based solution designed to provide simple, impactful agricultural support. The platform enables farmers to upload crop images for AI-based pest diagnosis, receive accurate pesticide recommendations, and find contact details of nearby pesticide suppliers. It also delivers localized weather updates and shares relevant government scheme information to ensure farmers don't miss out on critical benefits. To promote mental well-being, the system sends daily motivational messages, helping farmers feel supported and connected. Although built primarily as a web application, AgriSaarthi is also designed for future integration with drone systems for real-time crop monitoring and automated pest detection-bringing the power of AI and precision agriculture to farmers across all regions, regardless of their level of expertise.