PROBLEM STATEMENT

**Providing Farmers with Expert Help on Demand**

* **The Challenge:** Rohan, a young farmer in a village in rural Karnataka, inspects his tomato crop. A strange pattern of yellow spots has appeared on the leaves of several plants. Is it a fungus? A pest? The wrong kind of fertilizer? The local agricultural office is miles away, and by the time he gets an answer, a significant portion of his crop could be lost. He also faces another challenge: when to sell. The price he gets for his produce at the local mandi can vary wildly from day to day. A day's delay could mean the difference between a profitable season and a loss. He has a smartphone, but the information he needs—expert pest diagnosis, real-time market prices, and guidance on government subsidies—is scattered, complex, and not available in his native Kannada. He doesn't need more data; he needs an ally, an expert in his pocket who understands his land and his language.
* **The Objective:** Build "Project Kisan," an AI-powered personal assistant that acts as a personal agronomist, market analyst, and government scheme navigator for small-scale farmers. This agent should provide actionable intelligence to farmers, enabling them to protect their crops, maximize their income, and navigate complex agricultural systems. The agent should:
  + **Diagnose Crop Diseases Instantly:** Allow a farmer to take a photo of a diseased plant. The agent will use a multimodal Gemini model on Vertex AI to instantly analyze the image, identify the pest or disease, and provide clear, actionable advice on locally available and affordable remedies.
  + **Deliver Real-Time Market Analysis:** Enable a farmer to ask in their native language, "What is the price of tomatoes today?" The agent, built with Vertex AI Agent Builder, will fetch real-time data from public market APIs, use a Gemini model to analyze trends, and provide a simple, actionable summary to guide selling decisions.
  + **Navigate Government Schemes:** When a farmer asks about a specific need, like "subsidies for drip irrigation," the agent will use a Gemini model trained on government agricultural websites to explain relevant schemes in simple terms, list eligibility requirements, and provide direct links to application portals.
  + **Enable Voice-First Interaction:** Overcome literacy barriers by allowing farmers to interact entirely through voice. The agent will use Vertex AI Speech-to-Text and Text-to-Speech to understand queries in local dialects and respond with clear, easy-to-understand voice notes.
* **Tech Stack:** Use of Google AI technologies is mandatory.
* **Special prize for using Firebase Studio and deploying the project.**