# AI-Driven IoT Concept: Smart Agriculture System

Author: Group 47

**Scenario**

To enhance agricultural productivity, we propose a smart farming system powered by AI and IoT.   
This system will monitor real-time environmental and soil data using sensors, process the data through an AI model,   
and provide crop yield predictions to assist farmers in decision-making.

## 1. Sensors Needed

The system will deploy the following sensors across the farmland:  
- Soil Moisture Sensor – Measures soil water content  
- Temperature Sensor – Captures ambient temperature  
- Humidity Sensor – Monitors air moisture  
- Light Sensor (LDR) – Assesses sunlight exposure  
- pH Sensor – Measures soil acidity/alkalinity  
- Rainfall Sensor – Tracks precipitation levels

## 2. AI Model for Crop Yield Prediction

Chosen Model: Random Forest Regressor  
Why:  
- Effective with nonlinear tabular data  
- Handles missing data and noise  
- Easy to interpret and tune  
  
The model will be trained on historical crop yield data and real-time sensor inputs to forecast yields under varying conditions.

## 3. Data Flow Diagram (Textual Layout)

This is the Flow chart:  
  
Explanation:  
- Sensors feed real-time data to the IoT gateway.  
- The gateway sends the data to a cloud or local storage for aggregation.  
- The AI engine processes the stored data and outputs yield predictions.  
- Predictions are displayed via a dashboard or mobile app.

## Conclusion

This smart agriculture system combines IoT sensing and AI analysis to support data-driven farming decisions,   
helping farmers optimize irrigation, fertilizer use, and crop planning for higher yields.