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MID-COURSE PROJECT

1. Aim

To design and simulate a smart irrigation system in Cisco Packet Tracer that optimizes water usage in agricultural fields by monitoring soil moisture levels and triggering irrigation automatically when required.

2. Problem Statement

Water scarcity and inefficient irrigation practices lead to excessive water wastage and reduced crop productivity in agriculture. Traditional irrigation methods often lack precise control, leading to overwatering or underwatering, impacting soil health and yield.

There is a need for a cost-effective IoT-based smart irrigation system that:

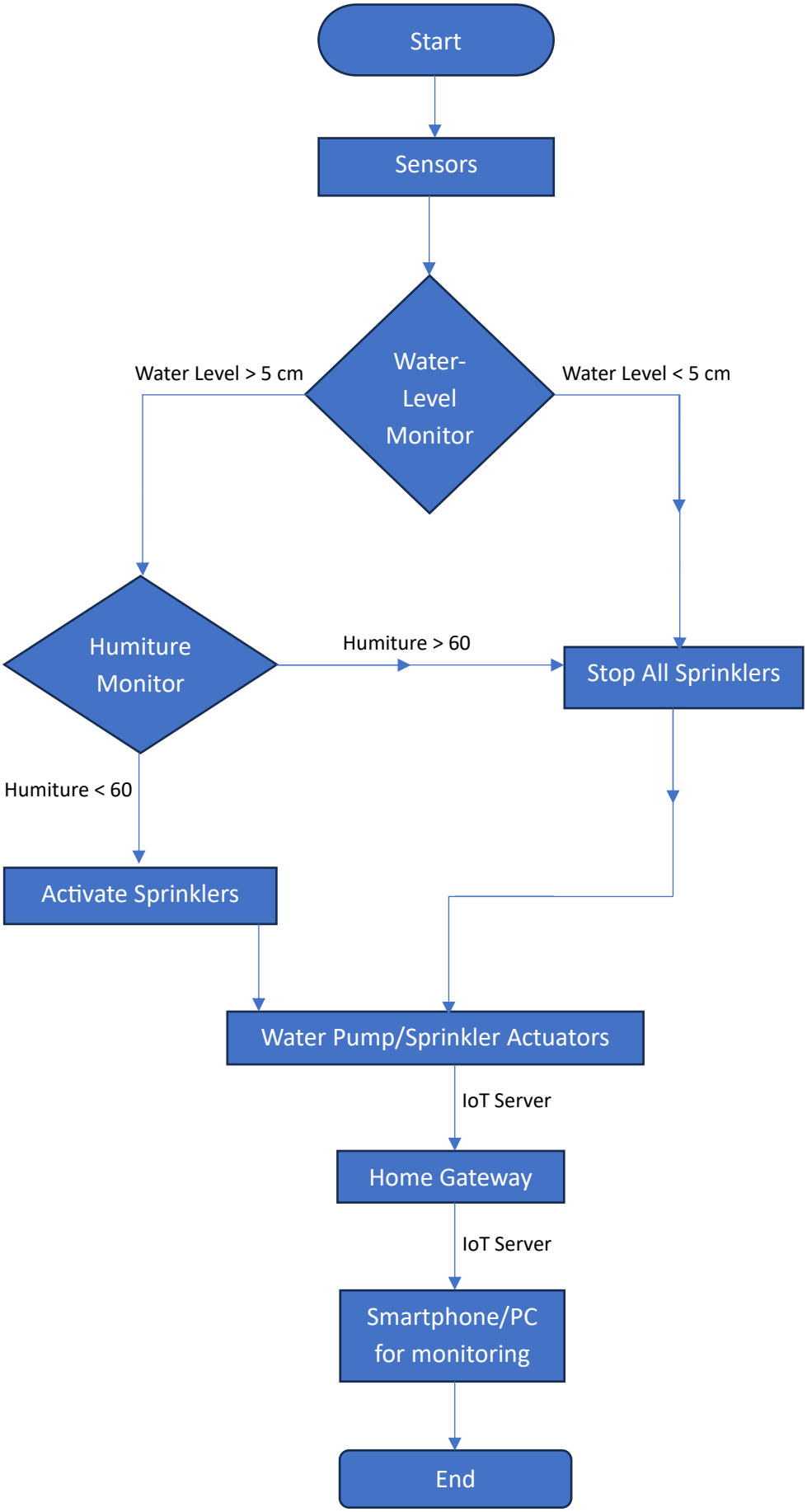
- Monitors real-time soil moisture levels.

- Automates irrigation based on soil needs.
- Optimizes water usage to support sustainable agriculture.

3. Scope of the Solution

- Simulation of IoT-based smart irrigation in Cisco Packet Tracer.
- Integration of soil moisture sensors in different zones of an agricultural field.
- Automation of water pumps/sprinklers based on real-time moisture data.
- Control and monitoring using a smartphone or PC via the IoT home gateway.
- Alerts to the farmer in case of critical low moisture or pump failures.
- This solution is scalable to large farms by adding additional sensors and actuators.

4.Overview/Architecture of the Solution



5. Components Used in Cisco Packet Tracer:

- Soil Moisture Sensors (IoT sensors)
- Water Pumps/Sprinklers (IoT actuators)
- Home Gateway (IoT)
- Smartphone/PC for monitoring and control
- IoT Server (PT Server)
- Router and Switch (for connectivity)
- Cloud (for remote monitoring, optional)

6. Simulated Circuit