**Assignment 1: Using DHT11 with Raspberry Pi and AWS - Situation**

Scenario: You are tasked with creating a smart environmental monitoring system for a greenhouse. The greenhouse is used to cultivate exotic plants, and precise control of temperature and humidity is crucial for their growth. Your goal is to set up a system that can monitor and maintain optimal environmental conditions.

Situation Description:

- The greenhouse contains a variety of delicate plants that require specific temperature and humidity levels for growth.

- Raspberry Pi with a DHT11 sensor is installed in the greenhouse.

- The DHT11 sensor continuously measures temperature and humidity.

- The Raspberry Pi is connected to AWS IoT, where it sends the data in real-time.

- If the temperature or humidity levels deviate from the desired range, an alert is sent to the greenhouse manager's mobile device.

- The manager can remotely adjust the greenhouse environment using a mobile app connected to AWS IoT, ensuring that the plants thrive.

This situation highlights the practical application of using the DHT11 sensor with a Raspberry Pi and AWS to create an IoT solution for environmental monitoring in agriculture.

**Assignment 2: Using DHT11 with ESP32 and AWS - Situation**

Scenario: You are working on a home automation project, specifically on improving the energy efficiency and comfort of a smart home. Your assignment is to integrate a temperature and humidity sensor into the smart home system and use the data for intelligent climate control.

Situation Description:

- The smart home is equipped with an ESP32 microcontroller.

- The ESP32, using a DHT11 sensor, regularly measures the temperature and humidity levels inside the house.

- The data is sent securely to AWS IoT for analysis and storage.

- Based on the temperature and humidity data, the home automation system optimizes heating, cooling, and ventilation to ensure energy efficiency and comfort.

- If high humidity is detected, the system can trigger a dehumidifier, or if the temperature is too low, it can activate the heating system.

- Users can remotely monitor and control the climate settings through a smartphone app connected to AWS IoT.

This situation showcases the application of using the DHT11 sensor with an ESP32 and AWS in a real-life home automation scenario, emphasizing energy efficiency and user comfort.

**Assignment 3: Monitoring Natural Light for Energy Efficiency in a Smart Office Building**

Scenario: You have been hired by a forward-thinking technology company to implement a smart lighting control system in their newly constructed office building. The company aims to maximize energy efficiency and create a comfortable workspace for employees.

Situation Description:

The office building is equipped with large windows that allow ample natural light to enter.

To optimize energy consumption, the building uses an advanced lighting control system that adjusts the artificial lighting based on the available natural light.

ESP32 microcontrollers with LDR sensors are installed in each office space, near the windows.

The LDR sensors continuously monitor the ambient light intensity, ranging from direct sunlight to cloudy conditions.

The ESP32 devices send the light intensity data to AWS IoT Core for real-time analysis and control.

Functionality: