Challenge 1: Simple Temperature Monitoring System

- **Objective:** Build a system that reads temperature data from a **DHT11** sensor and displays it on an LCD.
- **Key Learning Areas:**
  1. Sensor integration (DHT11).
  2. LCD setup and interfacing with Arduino.
  3. Understanding temperature data readings.
- **Tasks:**
  1. Connect the DHT11 sensor and LCD to Arduino Uno.
  2. Write code to read temperature and humidity values.
  3. Display the temperature and humidity on the LCD.
  4. Test for accurate sensor readings.

Challenge 2: LED Traffic Light System

- **Objective:** Create a simple traffic light system using **LEDs** to simulate the operation of a traffic signal.
- **Key Learning Areas:**
  1. Basic GPIO control using Arduino.
  2. Using timers and delays to create sequences.
- **Tasks:**
  1. Set up 3 LEDs (red, yellow, green) on a breadboard.
  2. Write a program to simulate traffic light operation (red → yellow → green).
  3. Add timing delays for realistic intervals between the lights.
  4. Test the system by running multiple cycles.

Challenge 3: Smart Light Control with a Button

- **Objective:** Control an LED using a button to simulate a smart light control system.
- **Key Learning Areas:**
  1. Button and LED control with Arduino.
  2. Debouncing for smooth button presses.
- **Tasks:**
  1. Set up an LED and button on a breadboard.
  2. Write code to turn the LED on/off with each button press.
  3. Implement debouncing to avoid multiple triggers from a single press.
  4. Test for smooth control of the LED.

Challenge 4: Smart Parking System

- **Objective:** Create a parking space monitoring system using an **ultrasonic sensor** to detect available parking spots and display the information on an LCD.
- **Key Learning Areas:**
  1. Ultrasonic sensor integration.
  2. Real-time distance measurement and parking spot detection.
  3. Displaying data on an LCD.
- **Tasks:**
  1. Connect an ultrasonic sensor and LCD to Arduino Uno.
  2. Write code to measure distance and determine if a parking space is occupied or empty.
  3. Display the parking status on the LCD (e.g., "Spot Available" or "Spot Occupied").
  4. Test the system with various objects at different distances