GROUP- B NAME- NIKUNJ AND JOSHUA

Project Proposal:

- **Project Name:** Simple Temperature Station
- **Objective:** To provide real-time monitoring of temperature, humidity, and using sensors interfaced with an Arduino Uno.
- **Scope:**
    - Measures and displays temperature and humidity data on an LCD.
    - Includes user input via a potentiometer to toggle display modes.
    - Performs basic calculations, such as daily averages, for meaningful insights.
    - Assumes a standard room environment for operation and is powered by USB or battery.
- **Team Roles:**
    - Tester
    - Programmer
    - Debugger

2. Hardware Documentation

1. **Component List:**
    - DHT11 Sensor (Temperature)
    - DHT22 Sensor (Humidity)
    - Arduino Uno
    - Potentiometer
    - LCD Display
    - Breadboard and connecting wires
2. **Schematics and Circuit Diagrams:**
    - A detailed diagram will show sensor connections to the Arduino Uno.
3. **Hardware Configuration Guide:**

   - Step-by-step instructions for assembling the sensors, potentiometer, and LCD with safety precautions(warning systems).

4. **Version Control for Hardware:**
   - Save circuit diagrams and updates on GitHub for easy reference.

3. Software Documentation

1. **Codebase Description:**
   - Overview of code structure and functionality in C programming language (e.g., libraries for sensors, LCD).
2. **Functionality Documentation:**
   - Document the purpose of key functions (e.g., reading sensor data, switching display modes).
3. **Installation Guide:**
   - Instructions for setting up Arduino IDE and required libraries(online research and tutorial guides).
4. **Flowcharts and Pseudocode:**
   - Logic diagrams to illustrate data flow from sensors to the LCD.
5. **Version Control for Software:**
   - Use GitHub to track code changes and updates.

4. Testing and Results

1. **Testing Plan:**
   - Verify sensor readings under various conditions to verify accuracy of sensors and output data display (e.g., temperature at 25°C, humidity at 40%).
2. **Results:**
   - Record observed outputs on the LCD and compare them to expected results.

5. Maintenance and Future Updates

1. **Maintenance Guide:**
   - Regularly check the DHT11 sensor and LCD for proper functioning.

6. Report

1. **Introduction:**
    - Overview of the project goals and its practical applications.
2. **Methodology:**
    - Description of hardware and software integration.
3. **Results:**
    - Summary of the project's outputs and observations.
4. **Conclusion:**
    - Discussion of successes, challenges, and potential improvements.

7. Tools for Documentation

- **Version Control:** GitHub for code and diagrams.
- **Documentation Tools:** Lucid charts for flow diagrams and schematics, shared project report doc for "on-the-go" project changes.

- **Member A**: Joshua
- **Member B**: Nikunj

- **Task Assignments**

Task/Responsibility	**Joshua**	**Nikunj**
Project Planning	Outline project objectives and scope.	Review and finalize project details.
Hardware Documentation	Create component list and descriptions.	Develop schematics and circuit diagrams.
Hardware Configuration Guide	Write step-by-step assembly instructions.	Include safety precautions and warnings.
Software Documentation	Codebase structure and functionality overview.	Write installation guide and document key functions.
Flowcharts and Pseudocode	Create flowcharts illustrating data flow.	Write pseudocode for main functionalities.

Task/Responsibility	**Joshua**	**Nikunj**
Component Testing	Test the DHT11 and DHT22 sensors for accuracy.	Test the LCD display and potentiometer functionality.
Testing Plan	Develop test cases for sensor functionality.	Create testing procedures for display accuracy.
Results Documentation	Record observed outputs from tests.	Compare outputs to expected results.
Maintenance Guide	Draft regular maintenance procedures.	Prepare recommendations for future updates.
Final Report Compilation	Write sections on introduction and methodology.	Summarize results and conclusions.
Version Control	Manage GitHub repository for hardware.	Manage GitHub repository for software.

- **Meeting Schedule**
- **Weekly Team Meetings**:
  Day: Every monday
  Time: 4:00 PM - 5:00 PM in person
  Platform: Zoom / Google Meet / In-person (as preferred)
- **Meeting Agenda**
- **Check-in**: Quick updates from each member on assigned tasks.
- **Progress Discussion**: Share any challenges encountered and brainstorm solutions.
- **Next Steps**: Plan tasks for the upcoming week, including deadlines for testing and report completion.
- **Q&A**: Open floor for questions or additional suggestions.

Project Report Writing Approach

We plan to write our project report incrementally, documenting each phase of our **Simple Temperature Station** project as we progress. Here’s our step-by-step approach:

1. **Initial Overview**: We will draft an overview that includes the project name, objectives, and scope right after our planning phase.
2. **Hardware Documentation**: After assembling the hardware, we will document:
   - Component list with descriptions.
   - Schematics and circuit diagrams.
   - A step-by-step hardware configuration guide.
3. **Software Documentation**: Once the coding is underway, we will outline:
   - Codebase structure and key functions.
   - Installation guide for the Arduino IDE and libraries.
4. **Flowcharts and Pseudocode**: We will create flowcharts and pseudocode to illustrate data flow and logic.
5. **Component Testing**: After testing each component, we will document:
   - Testing procedures.
   - Results, comparing observed outputs to expected values.
6. **Maintenance and Future Recommendations**: We will draft a maintenance guide and suggestions for future enhancements.
7. **Final Report Compilation**: Finally, we will compile all sections into a cohesive report, including an abstract, introduction, methodology, results, and conclusion.

We will hold weekly meetings to review progress and update the report collaboratively, ensuring comprehensive documentation throughout the project.