Task Statement for Beginner-Level Intern on PIC18F4500 with Digital/Analog Inputs and Buzzer Notification

Title: Basic Embedded System Development using PIC18F4500 with Digital/Analog Inputs and Buzzer Notification

Objective: For the intern to design and implement a simple embedded system using the Microchip PIC18F4500 microcontroller. The system will incorporate digital and analog inputs, process these inputs, and provide notifications via a buzzer.

Logic: Push Buttons

Scope of Work:

Push Button1	Push Button 2	LED 1	LED 2	LED 3	LED 4
Not pressed	Not pressed	glows			
Not pressed	Pressed		glows		
Pressed	Not pressed			glows	
Pressed	Pressed				glows

If the analog input from the sensor crosses threshold then blows buzzer.

1. Learning Objectives:

   - Understand the basics of the PIC18F4500 microcontroller.

   - Learn how to interface digital and analog inputs with the PIC18F4500.

   - Gain experience in programming the PIC18F4500 for input processing and buzzer control.

2. System Design:

   - Use digital inputs (e.g., buttons or switches) for triggering specific actions.

   - Incorporate an analog input (e.g., a temperature sensor or a potentiometer) to read and process varying signals.

   - Utilize a buzzer for audio notifications based on input conditions.

3. Component Selection:

- Microcontroller: PIC18F4500.

  - Digital Inputs: Buttons or switches.

  - Analog Input: A basic sensor like a potentiometer or a simple temperature sensor.

  - Output Device: A buzzer for audio notification.

  - Power Supply: Suitable DC power supply for the PIC18F4500 and peripherals.

4. Task Execution:

  - Digital Input Task: Program the PIC18F4500 to respond to digital inputs, such as turning the buzzer on/off.

  - Analog Input Task: Read analog input values and implement a logic to trigger the buzzer under certain conditions (e.g., temperature threshold or potentiometer value).

  - Buzzer Control: Develop logic for different buzzer notifications based on the input signals.

5. Documentation:

  - Document the design, including circuit diagrams and code.

  - Explain the logic used for input processing and buzzer notification.

6. Learning Outcomes:

  - Practical experience with the PIC18F4500.

  - Understanding of digital and analog input processing.

  - Experience in creating simple notification systems with audio feedback.

Deliverables:

- A working prototype demonstrating the use of digital/analog inputs and buzzer notifications.

- Software code for the PIC18F4500.

- Complete project documentation.

Intern's Responsibilities:

- Study the basics of the PIC18F4500 and its programming.

- Design and implement the input and output system.

- Test the system to ensure it works as expected.

- Document the project, including a description of the learning process.

Project Duration: [Three Days]

Budget: [Not applicable]

This task is designed for a beginner-level intern to gain hands-on experience with the PIC18F4500 microcontroller, focusing on interfacing digital and analog inputs and implementing basic output functionality. The use of a buzzer for notifications will introduce the intern to the concepts of audio signaling in embedded systems.