

Task Scheduler Overview

The task scheduler manages essential operations like reading the room temperature, detecting button presses, controlling the LED (heater indicator), and sending data via UART. Tasks are scheduled using a timer that triggers every 100ms to ensure smooth and timely operation.

Algorithm Description

The task scheduler operates based on time intervals:

- **Every 200ms:** Checks for button presses to adjust the set-point temperature.
- **Every 500ms:** Reads the current room temperature from the sensor.
- **Every 1000ms (about 2 seconds):** Updates the LED and sends data via UART in the format <RoomTemp, SetPoint, HeatStatus, ElapsedTime>.

Inputs and Outputs

- **Inputs:**
 - **Button0:** Increases the set-point temperature.
 - **Button1:** Decreases the set-point temperature.
 - **Temperature Sensor:** Provides the room temperature.
- **Outputs:**
 - **LED:** Indicates whether the heater (LED) is on or off.
 - **UART Output:** Sends temperature data to simulate server communication.

Peripheral Usage

- **UART:** Configured at 115200 baud rate, used to send system data every second.
- **I2C:** Communicates with the temperature sensor at 400kHz.
- **GPIO:** Handles button inputs and controls the heater's LED output.
- **Timer:** Triggers tasks at 100ms intervals to keep the system running efficiently.

Cloud Connectivity

The **TI CC3220S** has built-in Wi-Fi, simplifying cloud connectivity for data transmission. In contrast, **Microchip** and **Freescall** systems need external Wi-Fi modules to achieve the same functionality.