CS3237: Introduction to Internet of Things - Lab Assignment
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The video can be accessed at https://www.youtube.com/watch?v=t1W_kdXPccY.

The high level structure of the application is summarized in Figure 1. The main function initializes clock gating for the peripherals and initializes the three task functions readOPT3001(), readMpu9250(), and PWMLED() as threads. The task readOPT3001() reads and converts the raw data into light intensity. The task readMpu9250() reads and converts the raw data into acceleration. The task PWMLED() takes the maximum of mpuDc or optDc and sets the duty cycle of the LED. The data type of mpuDc and optDc are given volatile to prevent the compiler from making unnecessary optimizations that could cause the program to behave unexpectedly.

```c
volatile float mpuDc = 0; // Enables OPT sensor
volatile float optDc = 0; // Enables OPT sensor
void readOPT3001(UArg arg0, UArg arg1) {
    // Enables OPT sensor
    while(1){
        // Reads light intensity from light sensor
    }
}
void readMpu9250() {
    // Enables MPU sensor
    while (1) {
        // Reads acceleration from accelerometer
    }
}
void PWMLED(UArg arg0, UArg arg1) {
    // Enables PWM
    while (1) {
        // Set PWM according to the max of mpuDC or optDc
    }
}
int main(void) {
    // Enables board peripherals
    // Initializes tasks as threads
}
```

Figure 1: High Level Structure

Table 1 shows the duration to sleep given to each task. The task transitions from running to a blocked state and put to sleep. The value of sleep in Table 1 is passed to the function Task_sleep() and delays its execution for the number of ticks of the system clock. The time elapsed per tick is determined by Clock_tickPeriod, which is set to 10us per tick inside the file main.cfg. 10000 ticks allows CC2650 sensor tag enough time to read and set data from different peripherals and time to context switch between threads during round robin.

Task	readOPT3001()	readMpu9250()	PWMLED()
Sleep (nticks)	10000	10000	10000
Sleep (us)	100000	100000	100000

Table 1: Sleep Period of Task