

**Batch: A2      Roll No.: 16010322014**  
**Experiment / assignment / tutorial No.\_\_\_\_5\_\_\_\_**  
**Grade: AA / AB / BB / BC / CC / CD /DD**

**Signature of the Staff In-charge with date**

**TITLE:** Blink LED using FreeRTOS

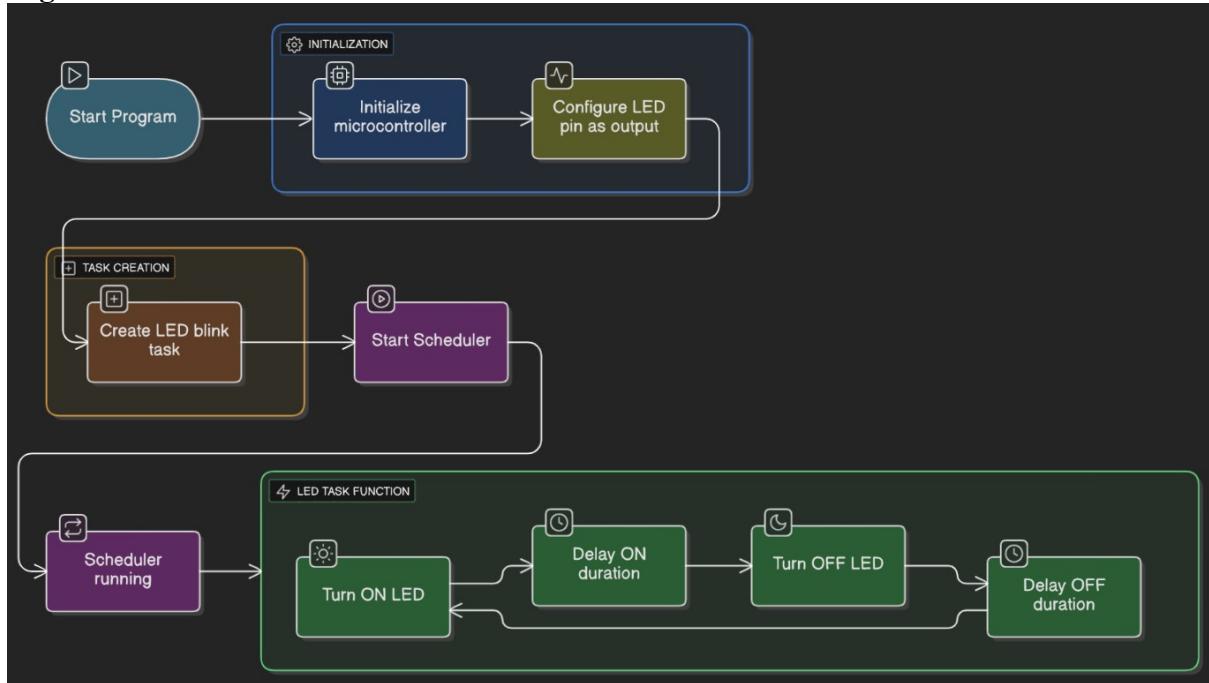
**AIM:** Write a program to blink LED connected at P0.31 using FreeRTOS API

**OUTCOME:** Students will be able to understand the open source RTOS and their usage

**Tool Used:** - Keil uVision, Flash Magic, FreeRTOS Source Code

**Component required:** - Development Board- LPC2148 ARM7 based board  
 UART to USB Converter- For UART0 Communication

**Algorithm:** -



### Procedure: -

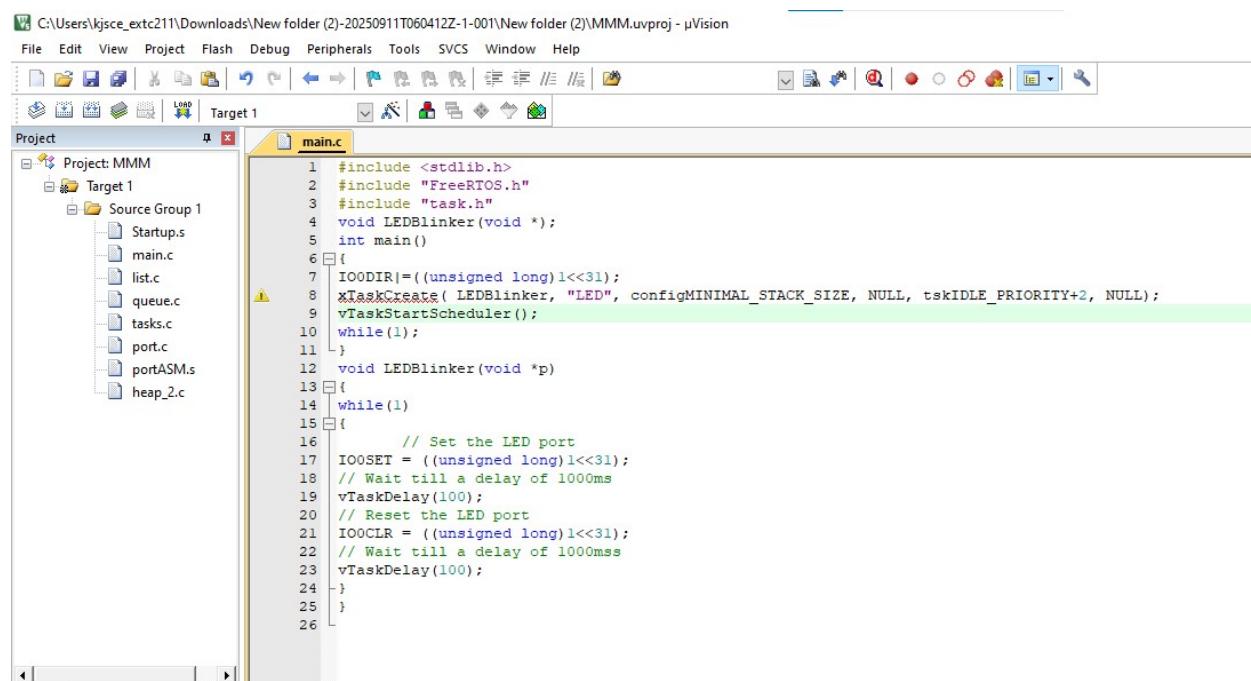
1. **Set up the development environment**
  - o Open the project in Keil uVision
  - o Include FreeRTOS source code (with correct port for LPC2148).
2. **Configure UART0 on LPC2148**
  - o Initialize UART0 for communication.
  - o Set baud rate, stop bits, and enable UART interrupts.
3. **Create FreeRTOS tasks**
  - o **Task 1:** Waits on a binary semaphore and processes incoming data.
  - o **Task 2 (ISR):** Triggered when UART0 receives data and gives the semaphore.
4. **Build and flash the code to LPC2148**
  - o Use any LPC programmer to flash the compiled hex file.
5. **Test UART Communication**
  - o Connect UART0 to PC via USB-UART adapter.

### FreeRTOS API: -

**xTaskCreate** Used to create a new task.

**vTaskStartScheduler** Starts the RTOS scheduler, which begins executing the created tasks according to their priorities.

**vTaskDelay** Puts the calling task into the Blocked state for a specified number of tick periods.

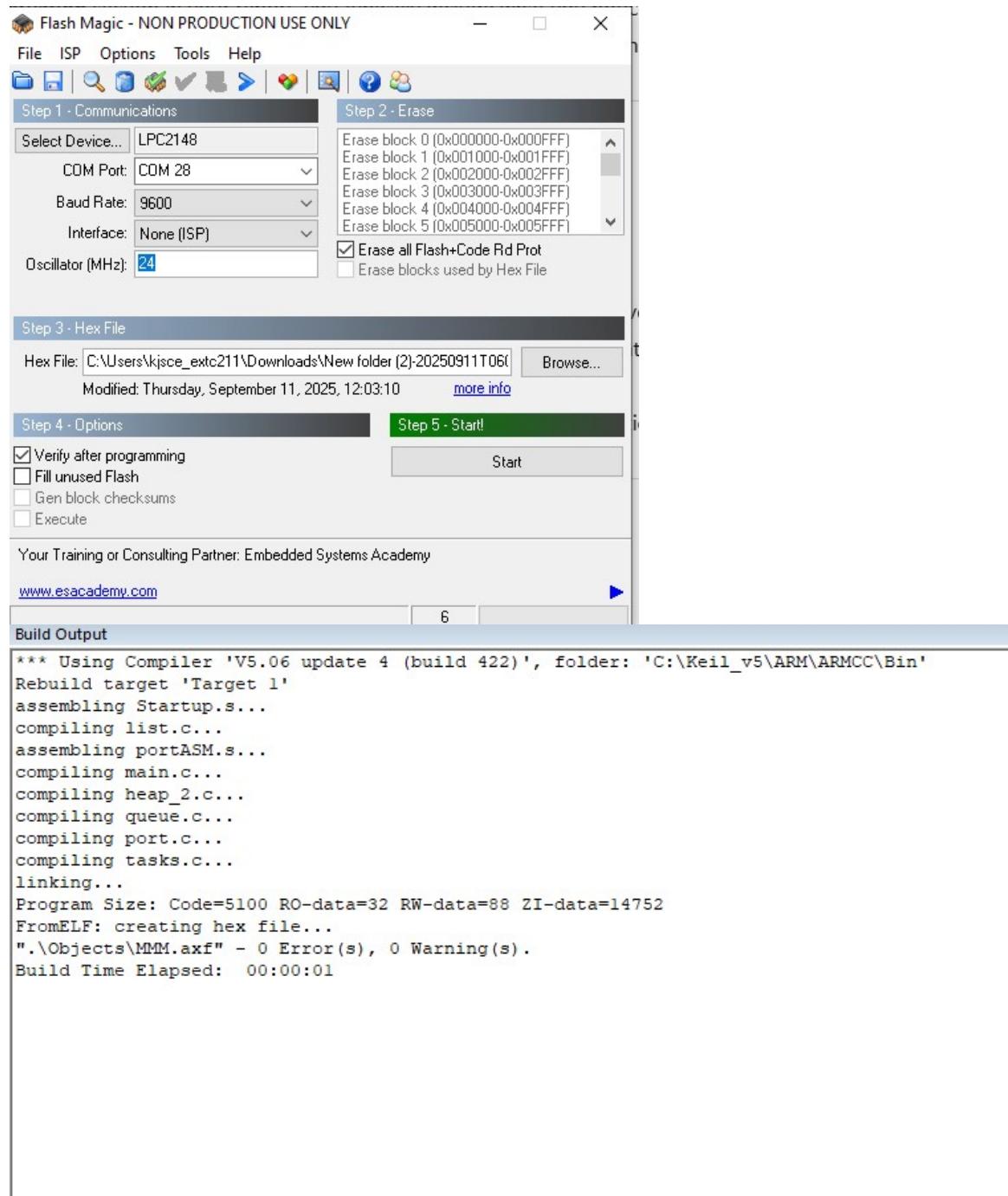


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C:\Users\kjsce_extc211\Downloads\New folder (2)-20250911T060412Z-1-001\New folder (2)\MMM.uvproj - uVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
File Project Target 1 Project: MMM Target 1 Source Group 1 main.c
main.c
1 #include <stdlib.h>
2 #include "FreeRTOS.h"
3 #include "task.h"
4 void LEDBlinker(void *p);
5 int main()
6 {
7     IOODIR|=((unsigned long)1<<31);
8     xTaskCreate( LEDBlinker, "LED", configMINIMAL_STACK_SIZE, NULL, tskIDLE_PRIORITY+2, NULL);
9     vTaskStartScheduler();
10    while(1);
11 }
12 void LEDBlinker(void *p)
13 {
14     while(1)
15     {
16         // Set the LED port
17         IOOSET = ((unsigned long)1<<31);
18         // Wait till a delay of 1000ms
19         vTaskDelay(100);
20         // Reset the LED port
21         IOOCLR = ((unsigned long)1<<31);
22         // Wait till a delay of 1000mss
23         vTaskDelay(100);
24     }
25 }

```

## Observations:



### **Conclusion:**

In this experiment, an LED was successfully blinked using the FreeRTOS API. The use of task creation, scheduling, and delay functions demonstrated real-time task management. Students gained practical understanding of open-source RTOS concepts and their applications in embedded systems.

**Signature of faculty in-charge with date**