ĐẠI HỌC BÁCH KHOA TP. HỒ CHÍ MINH
KHOA KHOA HỌC VÀ KỸ THUẬT MÁY TÍNH

BÁO CÁO HỆ THỐNG NHÚNG

Bài thực hành số 4

Lương Hữu Phú Lợi - 1911545
Cao Thanh Lương - 1914076
Nguyễn Văn Việt - 1912436
Huỳnh Ngọc Bảo Trân - 1912269

Họ và tên	MSSV	Đóng góp
Lương Hữu Phú Lợi	1911545	100%
Cao Thanh Lương	1914076	100%
Nguyễn Văn Việt	1912436	100%
Huỳnh Ngọc Bảo Trân	1912269	100%

GitHub:
PhuLoi-1911545/school-LAB-embedded-ESP-IDF (github.com)

1. Thực hiện

Tạo một Project ESP_IDF, sau đó code file main với nội dung như sau

```c
TimerHandle_t xTimer1;
TimerHandle_t xTimer2;


void periodic_timer_callback(TimerHandle_t arg) {
    const char *name = pcTimerGetTimerName(arg);
    uint32_t count = (uint32_t)pvTimerGetTimerID(arg);
    count ++;

    if(strcmp(name,"Timer 1")) {
        if(count > TIMER_1_MAX) {
            printf("STOP Timer 1\n");
            xTimerStop(arg,0);
        }
        else {
            printf("ahihi - Nhom 3 L01 - HCMUT K19\n");
            vTimerSetTimerID(arg,(void*)count);
        }
    }
    else if (strcmp(name,"Timer 2")) {
        if(count > TIMER_2_MAX) {
            printf("STOP Timer 2\n");
            xTimerStop(arg,0);
        }
        else {
            printf("ihaha - Nhom 3 L01 - HCMUT K19\n");
            vTimerSetTimerID(arg,(void*)count);
        }
    }
}


void app_main(void)
{

    xTimer1 = xTimerCreate(
        // NULL,          /* Task function. */
        "Timer 1",        /* String with name of task. */
        pdMS_TO_TICKS(2000),            /* Stack size in bytes. */
        pdTRUE,             /* Parameter passed as input of the task */
```

```
        }
        else {
            printf("Timer 2 - Nhom 3 L01 - HCMUT K19\n");
            vTimerSetTimerID(arg,(void*)count);
        }
    }
}


void app_main(void)
{

    xTimer1 = xTimerCreate(
        // NULL,          /* Task function. */
        "Timer 1",        /* String with name of task. */
        pdMS_TO_TICKS(2000),            /* Stack size in bytes. */
        pdTRUE,             /* Parameter passed as input of the task */
        0,                /* Priority of the task. */
        periodic_timer_callback               /* Task handle. */
    );

    xTimer2 = xTimerCreate(
        // NULL,          /* Task function. */
        "Timer 2",        /* String with name of task. */
        pdMS_TO_TICKS(3000),            /* Stack size in bytes. */
        pdTRUE,             /* Parameter passed as input of the task */
        0,                /* Priority of the task. */
        periodic_timer_callback               /* Task handle. */
    );

    xTimerStart(xTimer1, 0);
    xTimerStart(xTimer2,0);
}
```

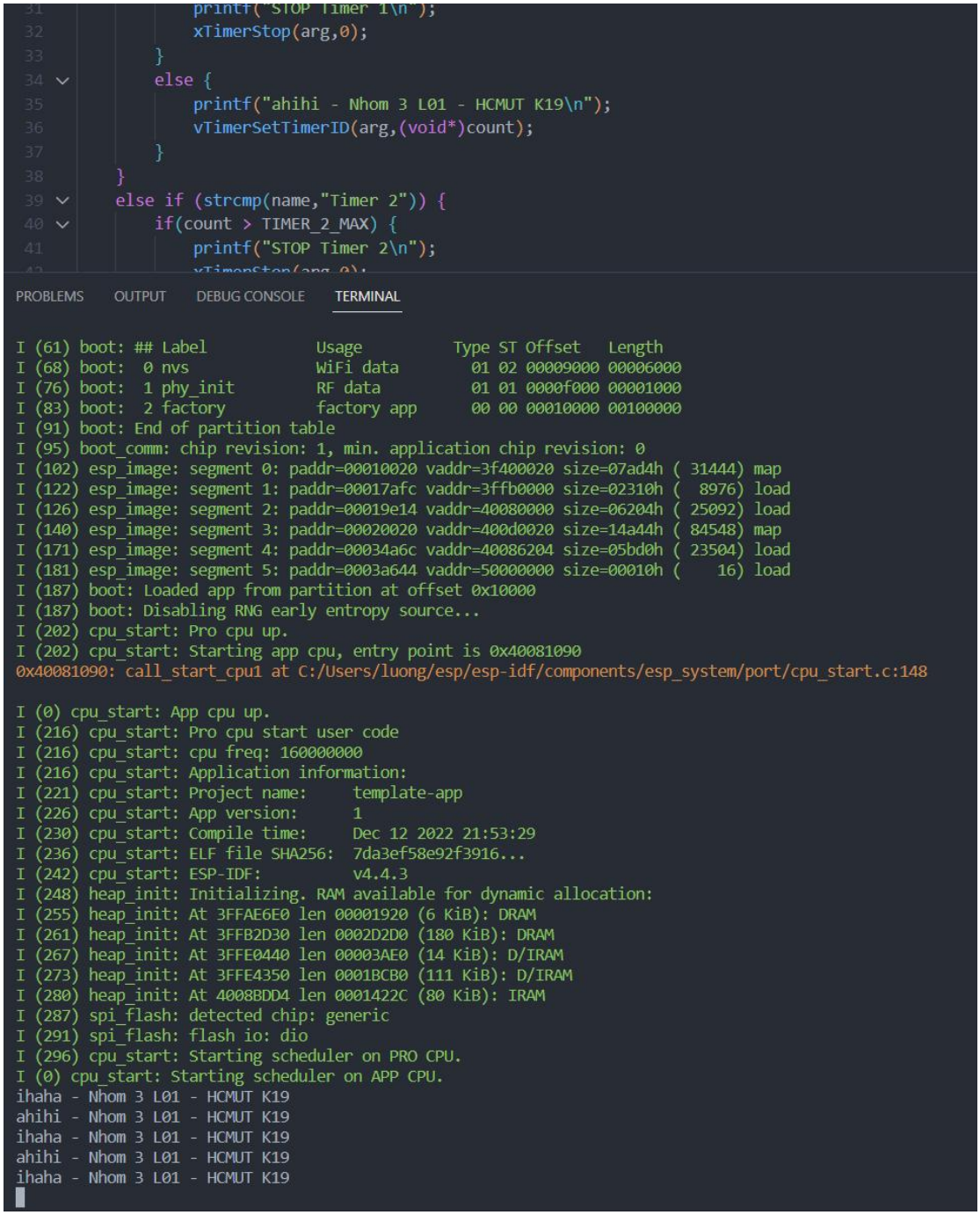
```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

Total sizes:
Used static DRAM:   11568 bytes ( 169168 remain, 6.4% used)
      .data size:    8976 bytes
      .bss  size:    2592 bytes
Used static IRAM:   48594 bytes (  82478 remain, 37.1% used)
      .text size:   47567 bytes
   .vectors size:    1027 bytes
Used Flash size :  115999 bytes
      .text     :   84547 bytes
      .rodata   :   31196 bytes
Total image size:  173569 bytes (.bin may be padded larger)
```

Giải thích:

- Hàm callback được sử dụng chung của 2 timer hàm void **periodic_timer_callback**
- Hàm sẽ xét tên của timer gọi nó và thực hiện tác vụ tương ứng
- 2 timer ở đây là **Timer 1** và **Timer 2**

2. Nạp và kết quả

- Nạp vào esp, ta thấy kết quả hiện lên màn hình serial



```
            printf("STOP Timer 1\n");
            xTimerStop(arg,0);
        }
        else {
            printf("ahihi - Nhom 3 L01 - HCMUT K19\n");
            vTimerSetTimerID(arg,(void*)count);
        }
    }
    else if (strcmp(name,"Timer 2")) {
        if(count > TIMER_2_MAX) {
            printf("STOP Timer 2\n");
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
I (61) boot: ## Label            Usage          Type ST Offset   Length
I (68) boot:  0 nvs              WiFi data        01 02 00009000 00006000
I (76) boot:  1 phy_init         RF data          01 01 0000f000 00001000
I (83) boot:  2 factory          factory app      00 00 00010000 00100000
I (91) boot: End of partition table
I (95) boot_comm: chip revision: 1, min. application chip revision: 0
I (102) esp_image: segment 0: paddr=00010020 vaddr=3f400020 size=07ad4h ( 31444) map
I (122) esp_image: segment 1: paddr=00017afc vaddr=3ffb0000 size=02310h (  8976) load
I (126) esp_image: segment 2: paddr=00019e14 vaddr=40080000 size=06204h ( 25092) load
I (140) esp_image: segment 3: paddr=00020020 vaddr=400d0020 size=14a44h ( 84548) map
I (171) esp_image: segment 4: paddr=00034a6c vaddr=40086204 size=05bd0h ( 23504) load
I (181) esp_image: segment 5: paddr=0003a644 vaddr=50000000 size=00010h (    16) load
I (187) boot: Loaded app from partition at offset 0x10000
I (187) boot: Disabling RNG early entropy source...
I (202) cpu_start: Pro cpu up.
I (202) cpu_start: Starting app cpu, entry point is 0x40081090
0x40081090: call_start_cpu1 at C:/Users/luong/esp/esp-idf/components/esp_system/port/cpu_start.c:148

I (0) cpu_start: App cpu up.
I (216) cpu_start: Pro cpu start user code
I (216) cpu_start: cpu freq: 160000000
I (216) cpu_start: Application information:
I (221) cpu_start: Project name:     template-app
I (226) cpu_start: App version:      1
I (230) cpu_start: Compile time:     Dec 12 2022 21:53:29
I (236) cpu_start: ELF file SHA256:  7da3ef58e92f3916...
I (242) cpu_start: ESP-IDF:          v4.4.3
I (248) heap_init: Initializing. RAM available for dynamic allocation:
I (255) heap_init: At 3FFAE6E0 len 00001920 (6 KiB): DRAM
I (261) heap_init: At 3FFB2D30 len 0002D2D0 (180 KiB): DRAM
I (267) heap_init: At 3FFE0440 len 00003AE0 (14 KiB): D/IRAM
I (273) heap_init: At 3FFE4350 len 0001BCB0 (111 KiB): D/IRAM
I (280) heap_init: At 4008BDD4 len 0001422C (80 KiB): IRAM
I (287) spi_flash: detected chip: generic
I (291) spi_flash: flash io: dio
I (296) cpu_start: Starting scheduler on PRO CPU.
I (0) cpu_start: Starting scheduler on APP CPU.
ihaha - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ihaha - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ihaha - Nhom 3 L01 - HCMUT K19
```

```
I (0) cpu_start: App cpu up.
I (216) cpu_start: Pro cpu start user code
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ihaha - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
STOP Timer 2
ahihi - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
ahihi - Nhom 3 L01 - HCMUT K19
STOP Timer 1
```

- Chuỗi “Timer 2 - Nhom 3 L01 - HCMUT K19 “ được in ra 3 giây sau mỗi lần và in ra 5 lần

- Chuỗi “Timer 1 - Nhom 3 L01 - HCMUT K19 “được in ra 2 giây sau mỗi lần và in ra 10 lần