./

Learning Report

C Programming & REAL TIME OPERATING SYSTEMS



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ver. Rel. No.** | **Release Date** | **Prepared. By** | **Reviewed By** | **Approved By** |
| 1 | 08-03-2021 | Kamran Akhtar |  |  |
| 2 | 09-03-2021 | Kamran Akhtar |  |  |
| 3 | 10-03-2021 | Kamran Akhtar |  |  |
| 4 | 11-03-2021 | Kamran Akhtar |  |  |
| 5 | 12-03-2021 | Kamran Akhtar |  |  |
| 6 | 13-03-2021 | Kamran Akhtar |  |  |

**Document History**

Contents

[Task 1: 5](#_Toc66547047)

[A. Description 5](#_Toc66547048)

[B. Learning Outcome 5](#_Toc66547049)

[C. Challenges 5](#_Toc66547050)

[D. Resources 5](#_Toc66547051)

[E. Submission 5](#_Toc66547052)

[Task 2: 6](#_Toc66547053)

[A. Description 6](#_Toc66547054)

[B. Learning Outcome 6](#_Toc66547055)

[C. Challenges 6](#_Toc66547056)

[D. Resources 6](#_Toc66547057)

[E. Submission 6](#_Toc66547058)

[Task 3: 7](#_Toc66547059)

[A. Description: 7](#_Toc66547060)

[B. Learning Outcome 7](#_Toc66547061)

[C. Challenges 7](#_Toc66547062)

[D. Resources 7](#_Toc66547063)

[E. Submission 7](#_Toc66547064)

DAY1\_ACTIVITY:

A. Description………………………………………………………………………………………………………………………………..……….

B. LEARNING OUTPUT……………………………………..……………………………………………………………………………………..

C. CHALLENGES………………………………………………………………………………………………………………………………………

D. RESOURCES………………………………………………………………………………………………………………………………………..

E. SUBMISSION……………………………………………………………………………………………………………………………………..

# Task 1:

## Description

To create a single project and implement INTERRUPT, ADC and UART using FreeRTOS. We have taken two tasks, one is with ADC and one with LED.

## Learning Outcome

* By pressing a button its changing from task 1 to task 2 with the help of using semaphore.
* Learned how to implement INTERRUPT, ADC and UART using FREERTOS.

## Challenges

Understanding and implementing the concepts of RTOS.

## Resources

1. <https://www.youtube.com/watch?v=muOL9SH0p9g&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=1>
2. <https://www.youtube.com/watch?v=k_fHypOMk9s&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=2>
3. <https://www.youtube.com/watch?v=SsBgNFEpfFE&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=3>
4. <https://www.youtube.com/watch?v=piC_aYENyxo&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=4>

## Submission

GIT HUB: <https://github.com/99003699/99003699_FREERTOS>

# Task 2:

## Description

This task is to implement a GPIO interrupt which signal a task that reads the value of ADC and send it to another task using Queue and second task will read from Queue and write it to UART.

## Learning Outcome

* 1st task excuted with returing ADC value and sent it to another task using queue.

## Challenges

* Finding relevant topics
* understanding and implementing them.

## Resources

1. <https://www.youtube.com/watch?v=J6J8EUcw6qU&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=5>
2. <https://www.youtube.com/watch?v=49Q4p4ARpng&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=6>

## Submission

GIT HUB: <https://github.com/99003699/99003699_FREERTOS>

# Task 3:

## Description:

This task is to implement ADC, PWM and various protocols(SPI/I2C/UART) using STM32F407 board and using software timer of RTOS. Implemented software timer both the one-shot and periodic timer for protocols and coming to one-shot when the timer expires task wont restart again and coming to periodic timer, timer will be automatically be restarted when it expires.

## Learning Outcome

* What we have done and outcome of this task is Implemented software timer both the one-shot and periodic timer for protocols and coming to one-shot when the timer expires task wont restart again and coming to periodic timer, timer will be automatically be restarted when it expires.

## Challenges

* Finding relevant topics for how to implement software timer for the application

## Resources

1. <https://www.youtube.com/watch?v=9H6vhgxQTTk&list=PLfIJKC1ud8gj1t2y36sabPT4YcKzmN_5D&index=9>

## Submission

GIT HUB: <https://github.com/99003699/99003699_FREERTOS>

**DAY1\_ACTIVITY:**

## Description:

C Programming question.

· Write a program to extract valid data if present, and pass it to the resultant array and working on array of struct.

· Watched videos on Introduction to FreeRTOS

## Learning Outcome

* Learned how to implement a array of structures in a application.
* Learned how to extract valid data from a data packet.
* Learned how to use the array of struct and how to work on those.

## Challenges

* Finding relevant topics for how to implement array of structures in application.

## Resources

## <http://www.throwtheswitch.org/unity>

## <http://pythontutor.com/c.html#mode=edit>

## Submission

GIT HUB: <https://github.com/99003699/99003699_FREERTOS>