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Learning Report

REAL TIME OPERATING SYSTEMS



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**Document History**

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**DAY1\_ACTIVITY:**

## Description:

C Programming question.

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

· 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.

## 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/99003660/RTOS_Tasks>

# 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>

## Submission

GIT HUB: <https://github.com/99003660/RTOS_Tasks>

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# 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

* To execute the task returning ADC value and send 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/99003660/RTOS_Tasks>

# Task 3:

## Description:

The task is to implement ADC, PWM and various protocols(SPI/I2C/UART) using STM32F407 board and using software timer of RTOS. Implemented software times- the periodic and one shot timer for protocols. One-shot timer when task expires, wont restart itself again, it has to be manually restarted whereas the periodic timer automatically restarts itself when the task expires at the predetermined time.

## 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/99003660/RTOS_Tasks>