# Learning Report

## REAL TIME OPERATING SYSTEMS

LTTS GLOBAL ENGINEERING ACADEMY

L&T Technology Services


**ICP Batch-**

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# Document History

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# Contents

# 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/99003684/RTOS_Submissions

# Task 2:

## A. 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.

## B. Learning Outcome

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

## C. Challenges

- Finding relevant topics
- understanding and implementing them.

## D. 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

## E. Submission

GIT HUB: https://github.com/99003684/RTOS_Submissions

# Task 3:

## A. 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.

## B. 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.

## C. Challenges

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

## D. Resources

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

## E. Submission

GIT HUB: https://github.com/99003684/RTOS_Submissions

# DAY1_ACTIVITY:

## A. 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

## B. Learning Outcome

- Learned how to implement a array of structures in a application.
- Learned how to extract valid data from a data packet.

## C. Challenges

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

## D. Resources

- **http://www.throwtheswitch.org/unity**
- **http://pythontutor.com/c.html#mode=edit**

## E. Submission

GIT HUB: https://github.com/99003684/RTOS_Submissions