

# Progress Presentation-I

e-Yantra Summer Internship-2016  
FreeRTOS on LPC2148

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# Overview of Project

Progress  
Presentation-I

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Overview of  
Project

Overview of Task

Task  
Accomplished

Challenges Faced

Future Plans

References

Thank You

- Project Name : FreeRTOS on LPC2148
- Objective : To create modules on the implementation of basic FreeRTOS concepts on LPC2148
- Deliverables : Documentation of each and every FreeRTOS concepts that has been implemented on LPC2148.

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Sr No.	TASKS	DEADLINES
1.	Basics of RTOS	4 days
2.	Multi-Tasking Examples	5 days
3.	Concepts of Semaphore and Mu- tex examples based on the concept	4 days
4.	Inter-Process communication- Mailbox and queues. Examples based on the concept	3 days
5.	Concept of Context Switching. Examples based on the concept	5 days
6.	A mini project that covers all the modules	3 days

# Task Accomplished

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- Learning basics of RTOS.
  - What is RTOS.
  - Its characteristics.
  - Difference between RTOS, GPOS.
- Implemented Multi-Tasking using FreeRTOS in Firebird V(LPC2148)
- Implemented Mutexes, Binary Semaphore and Counting Semaphore.
- Implemented Inter-Process communication.
- Implemented Context switching.
  - Queues
  - Mailbox through Task notification.

## Mutex

Back

Forward function access denied

Forward

Back Function access denied

Back

Forward function access denied

Forward

Back Function access denied

Back

## Binary Semaphore

Semaphore given

Back

Semaphore given

Forward

Semaphore given

Back

Semaphore given

Forward

Semaphore given

Back

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P3:Hungry  
P5:Ate  
P5:Thinking  
P4:Left fork obtained Eating :)  
P2:Right fork obtained  
P4:Ate  
P4:Thinking  
P2:Left fork obtained Eating :)  
P1:Right fork obtained  
P3:Hungry  
P5:Hungry  
P2:Ate  
P2:Thinking  
P1:Left fork obtained Eating :)  
P4:Right fork obtained  
P1:Ate  
P1:Thinking  
P4:Left fork obtained Eating :)  
P3:Right fork obtained  
P5:Hungry  
P2:Hungry  
P4:Ate  
P4:Thinking

## MailBox using Task Notification

No Notice

No Notice

No Notice

N1 sent a Message

Received MSG from N1

N2 sent a Message

Received MSG from N2

N3 sent a MSG

Received MSG from N3

N4 sent a MSG

Received MSG from N4

N1 sent a Message

Received MSG from N1

No Notice

N2 sent a Message

Received MSG from N2

No Notice

N3 sent a MSG

Received N1 sent a Message

ed MSG from N3

```
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data sent to Queue : Task 1
Data read from Queue : Task 1
Data sent to Queue : Task 1
Data read from Queue : Task 1
Data sent to Queue : Task 2
Data read from Queue : Task 1
Data sent to Queue : Task 3
Data read from Queue : Task 1
Data sent to Queue : Task 4
Data read from Queue : Task 1
Data sent to Queue : Task 1
Data read from Queue : Task 1
Data sent to Queue : Task 2
Data read from Queue : Task 1
Data sent to Queue : Task 3
```



# Challenges Faced

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- **Issue** : Porting RTOS into Firebird V and the configurations that needed changes.
- **Solution** : Replace the startup.s file and include various other libraries.
- Finding Implementation level difference between Binary Semaphore and Mutex.
- **Issue** : Loss of Data in Serial Communication.
- **Solution** :
  - Shortening the string size(temporary solution),
  - Tried creating a Mutex for accessing the Serial communication Functions.
  - Trying to solve Using Queues

# Future Plans

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- Smartphone Interfacing with FireBird V.
- Create a mini project that can demonstrate all the learnt concepts together.

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- <http://www.freertos.org>
- <http://tinymicros.com/>
- <http://www.ocfreaks.com/cat/embedded/lpc2148-tutorials/>
- <http://www.rtos.be/2013/05/mutexes-and-semaphores-two-concepts-for-two-different-use-cases/>

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THANK YOU !!!