

# EDF Scheduler Using FreeRTOS

## Group- 19

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### CONTRIBUTION MADE BY EACH MEMBER –

- Deepika Makhija -Executing task 2 which involved creating 3 tasks along with assigning periods and ticks along with documentation.
- Rohit Shambwani -Executing Task 1 and Task 3 which involved creating the scheduler `vscheduleEDF()` and API functions in a header file namely `getTemperature()`, `getPressure()`, `getHeight()`.All of this was done along with Hemanth Kumar.
- Panja Hemanth Kumar-- Executing Task 1 and Task 3 which involved creating the scheduler `vscheduleEDF()` and API functions in a header file namely `getTemperature()`, `getPressure()`, `getHeight()`.All of this was done along with Rohit Shambwani.

**DESCRIPTION** – This is a C code used to implement EDF algorithm with the help of FreeRTOS scheduler.

**Task 1** - Contain header file and c file

- Header file - We have declared 3 functions i.e., temperature, pressure and height and defined the attribute of these functions i.e., period and priority.
- C file - We have defined above mentioned function and program return the output of each function according to its constraints.

**Task 2** – We have created 3 tasks i.e., temperature, pressure and height and we are getting the tick count using `xTaskGetTickCount ()` (count the ticks) then we will schedule these tasks and printing the output of each function with its current tick value.

**Task3** – the function `vScheduleEDF ()`, which schedule the tasks based on the EDF algorithm with flow as following: Hyper period is calculated with all the task period

- Checking which task period is dividing with current tick count
- Calculating the deadline by adding tick count and period of that task
- Setting the priority using `vTaskPriorityset ()` (Setting the Priority)
- Adding these tasks to minheap then minheap will schedule the task with minimum deadline (we are using minheap as it takes  $O(1)$  time to find the minimum element and elements could be added dynamically)

**Output : –**

**Task 1 computes Temperature having period as 2 secs and priority as 3**

**Task 2 computes Height having period as 5 secs and priority as 2**

**Task 3 computes Pressure having period as 3 secs and priority as 1**

Uncomment the call to kbhit() in this file to also dump trace with a key press.

```
hiTask 1
My Temperature reading is 74 ,Current Tick Task 1 is 1
Task 2
My Height reading is 256, Current Tick Task2 Time is1

Task 3
My Pressure reading is 4, Current Tick Task3 Time is1

Task 1
My Temperature reading is 87 ,Current Tick Task 1 is 2001
Task 3
My Pressure reading is 3, Current Tick Task3 Time is3001

Task 1
My Temperature reading is 100 ,Current Tick Task 1 is 4001
Task 2
My Height reading is 288, Current Tick Task2 Time is5001

Task 3
My Pressure reading is 3, Current Tick Task3 Time is6001

Task 1
My Temperature reading is 32 ,Current Tick Task 1 is 6001
Task 1
My Temperature reading is 45 ,Current Tick Task 1 is 8001
Task 3
My Pressure reading is 3, Current Tick Task3 Time is9001

Task 2
My Height reading is 321, Current Tick Task2 Time is10001

Task 1
My Temperature reading is 58 ,Current Tick Task 1 is 10001
```