TRABALHO 1 DE SISTEMAS EMBARCADOS

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São demonstrados os três tipos de teste com carga baixa, média, alta, muitas tasks e um modo infactível com a execução feita pelo *Cheddar* e pelo meu algoritmo *rtsched.c*, no qual os escalonamentos estão de acordo, exceto no teste de escalonamento infactível no qual o código não tem suporte para perda de deadlines.
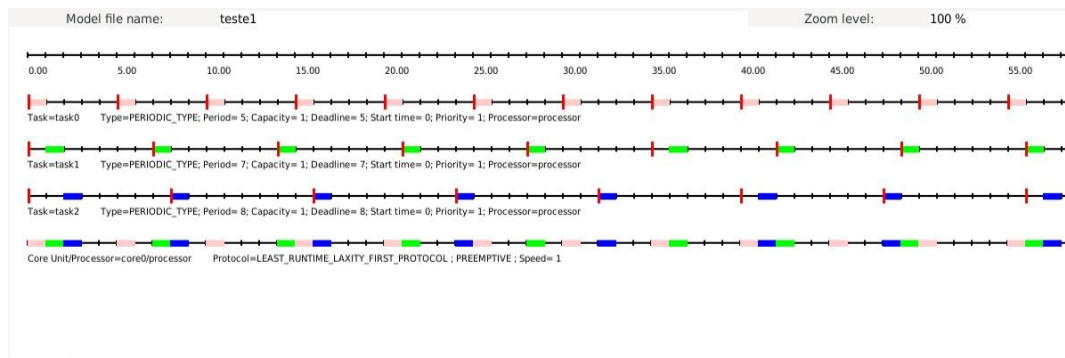
$$U_{task} = Capacity/Period$$

TESTE 1: BAIXA CARGA DE CPU

task0: 1 / 5 = 0.20
task1: 1 / 7 = 0.143
task2: 1 / 8 = 0.125
Total carga: = 0.468

- No task set ready to analyse : load a model from the 'File' menu, or edit task set from the 'Edit' menu.

- Task set ready to analyse : run analysis from the 'Tools' menu.

Scheduling simulation, Processor processor :

- Number of context switches : 126
- Number of preemptions : 0

- Task response time computed from simulation :
    task0 => 1/worst
    task1 => 2/worst
    task2 => 3/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

```
[task 0 100001]
[task 1 200000]
[task 2 300000]
[task 3 400000]
[task 4 500000]
[task 0 100002]
[task 3 400001]
[task 1 200001]
[task 2 300001]
[task 4 500001]
[task 0 100003]
[task 3 400002]
[task 4 500002]
[task 3 400003]
[task 1 200002]
[task 0 100004]
[task 2 300002]
[task 4 500003]
[task 3 400004]
[task 4 500004]
```
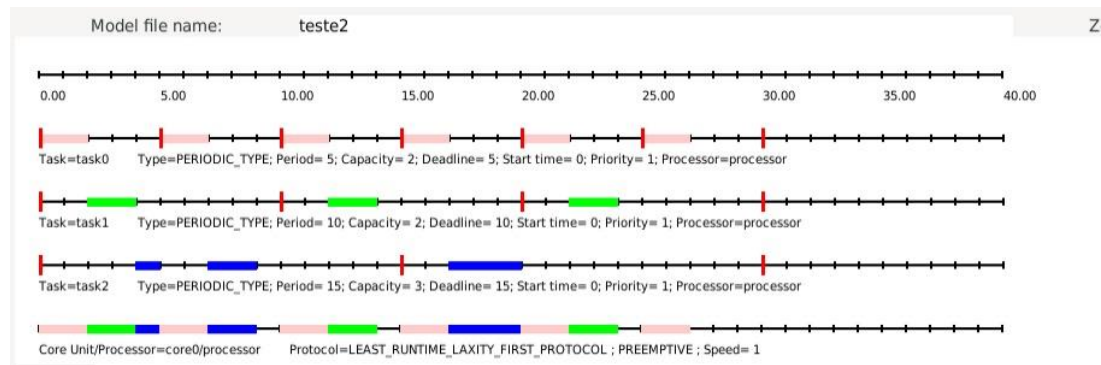
TESTE 2: CARGA MODERADA

task0: 2 / 5 = 0.40
task1: 2 / 10 = 0.20
task2: 3 / 15 = 0.20
Total carga: = 0.80

Model file name: teste2   Z

```
0.00        5.00        10.00       15.00       20.00       25.00       30.00       35.00       40.00
```

Task=task0   Type=PERIODIC_TYPE; Period= 5; Capacity= 2; Deadline= 5; Start time= 0; Priority= 1; Processor=processor

Task=task1   Type=PERIODIC_TYPE; Period= 10; Capacity= 2; Deadline= 10; Start time= 0; Priority= 1; Processor=processor

Task=task2   Type=PERIODIC_TYPE; Period= 15; Capacity= 3; Deadline= 15; Start time= 0; Priority= 1; Processor=processor

Core Unit/Processor=core0/processor   Protocol=LEAST_RUNTIME_LAXITY_FIRST_PROTOCOL ; PREEMPTIVE ; Speed= 1

- No task set ready to analyse : load a model from the 'File' menu, or edit task set from the 'Edit' menu.

- Task set ready to analyse : run analysis from the 'Tools' menu.

Scheduling simulation, Processor processor :

- Number of context switches : 11
- Number of preemptions : 1

- Task response time computed from simulation :
    task0 => 2/worst
    task1 => 4/worst
    task2 => 9/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

```
[task 0 100000]
[task 0 100001]
[task 0 100002]
[task 1 200000]
[task 1 200001]
[task 2 300000]
[task 0 100003]
[task 0 100004]
[task 2 300001]
[task 2 300002]
[task 3 400000]
[task 0 100005]
[task 0 100006]
[task 1 200002]
[task 1 200003]
[task 4 500000]
[task 0 100007]
[task 0 100008]
[task 2 300003]
[task 2 300004]
[task 2 300005]
[task 0 100009]
[task 0 100010]
[task 1 200004]
```
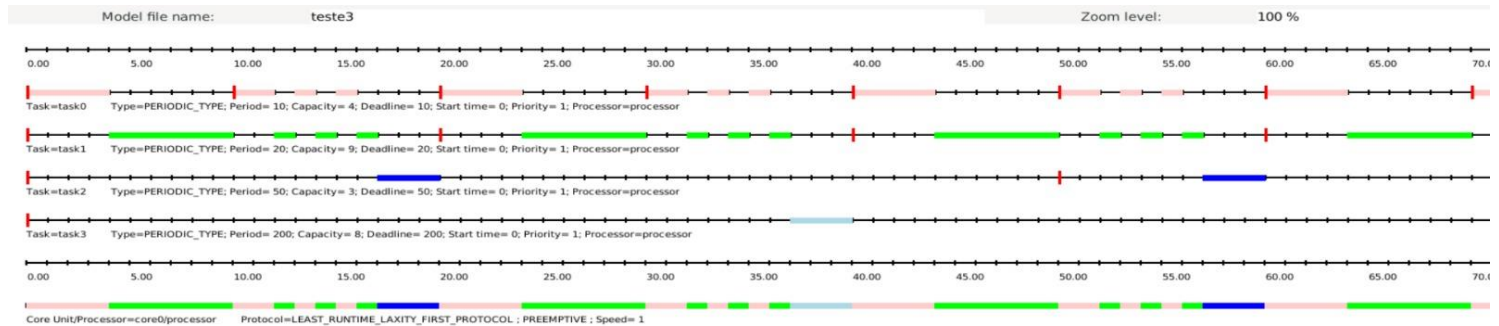
TESTE 3: CARGA ALTA

task0: 4 / 10 = 0.40
task1: 9 / 20 = 0.45
task2: 3 / 50 = 0.06
task3: 8 / 200 = 0.04
Total carga: = 0.95

| Model file name: | teste3 | | | Zoom level: | 100 % |

· No task set ready to analyse : load a model from the 'File' menu, or edit task set from the 'Edit' menu.

· Task set ready to analyse : run analysis from the 'Tools' menu.

Scheduling simulation, Processor processor :

· Number of context switches : 86
· Number of preemptions : 52

· Task response time computed from simulation :
   task0 => 6/worst
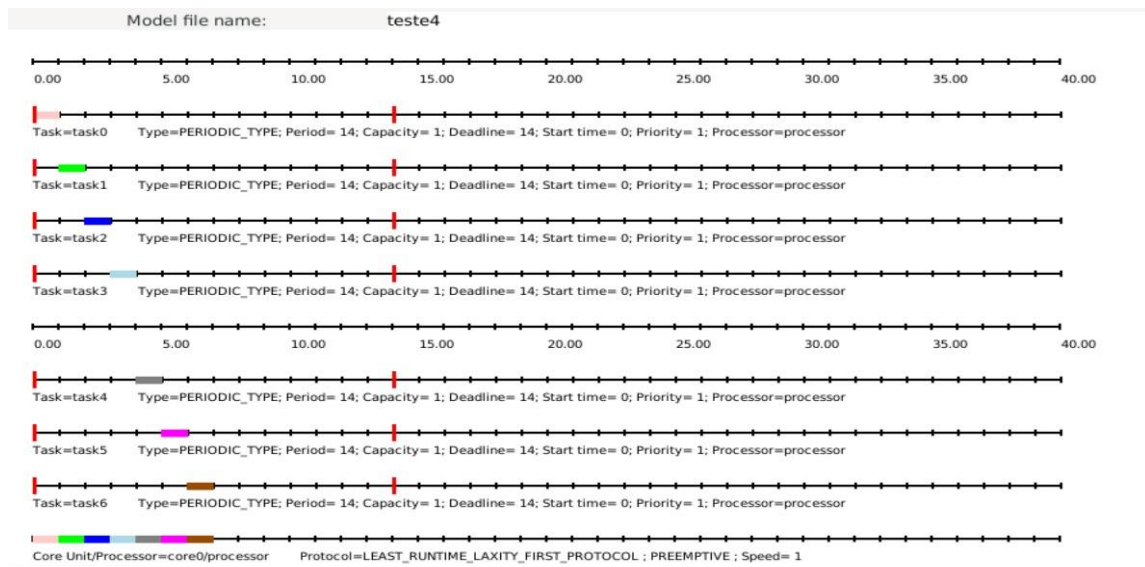   task1 => 17/worst
   task2 => 20/worst
   task3 => 99/worst
· No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

```
[task 0 100000]
[task 0 100001]
[task 0 100002]
[task 0 100003]
[task 0 100004]
[task 1 200000]
[task 1 200001]
[task 1 200002]
[task 1 200003]
[task 1 200004]
[task 1 200005]
[task 0 100005]
[task 0 100006]
[task 1 200006]
[task 0 100007]
[task 1 200007]
[task 0 100008]
[task 1 200008]
[task 2 300000]
[task 2 300001]
[task 2 300002]
[task 0 100009]
[task 0 100010]
[task 0 100011]
```

TESTE 4: Muitas Tasks RT

 7 Tasks RT e 1 BE

Cada tarefa RT: C = 1, P = 14 U_i = 1/14 = 0.0714
ΣU = 7·(1/14) = 0.5

Model file name: teste4

Task=task0   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task1   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task2   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task3   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task4   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task5   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Task=task6   Type=PERIODIC_TYPE; Period= 14; Capacity= 1; Deadline= 14; Start time= 0; Priority= 1; Processor=processor

Core Unit/Processor=core0/processor   Protocol=LEAST_RUNTIME_LAXITY_FIRST_PROTOCOL ; PREEMPTIVE ; Speed= 1

- No task set ready to analyse : load a model from the 'File' menu, or edit task set from the 'Edit' menu.

- Task set ready to analyse : run analysis from the 'Tools' menu.

Scheduling simulation, Processor processor :

- Number of context switches : 6
- Number of preemptions : 0

- Task response time computed from simulation :
  task0 => 1/worst
  task1 => 2/worst
  task2 => 3/worst

```
[task 0 100000]
[task 0 100001]
[task 1 200000]
[task 2 300000]
[task 3 400000]
[task 4 500000]
[task 5 600000]
[task 6 700000]
[task 7 800000]
[task 7 800001]
[task 7 800002]
[task 7 800003]
[task 7 800004]
[task 7 800005]
[task 7 800006]
[task 0 100002]
[task 1 200001]
[task 2 300001]
[task 3 400001]
[task 4 500001]
[task 5 600001]
[task 6 700001]
[task 7 800007]
```

TESTE 5: INFACTÍVEL (U > 1)

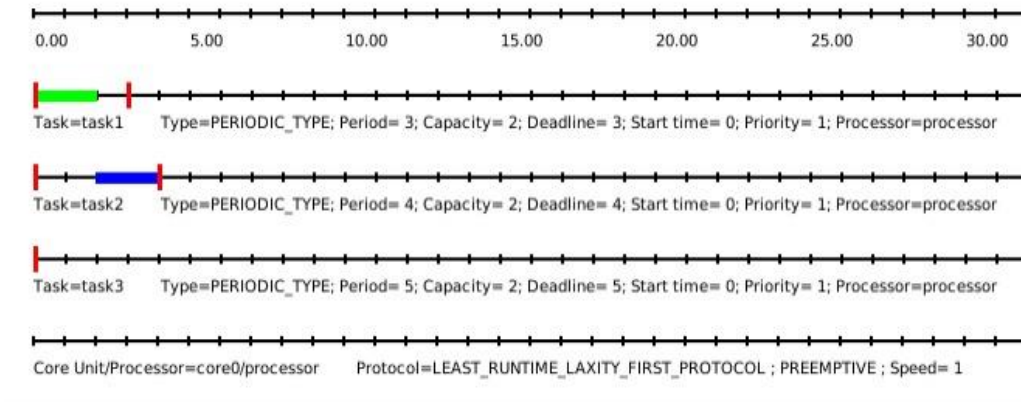task0: C0 = 2, P0 = 3   U0 = 0.667

task1: C1 = 2, P1 = 4   U1 = 0.500
task2: C2 = 2, P2 = 5   U2 = 0.400
Soma U = 1.567 > 1
+ 2 tarefas BE para preencher o Spawn

CONSTRAINT_ERROR scheduler-dynamic_priority-llf-runtime_based.adb:114 range check failed

Scheduling simulation, Processor processor :

- Number of context switches : 1
- Number of preemptions : 0

- Task response time computed from simulation :
   task1 => 2/worst
   task2 => 4/worst
   task3 => 0/worst , response time not computed since the task did not run all its capacity
- One or several tasks did not complete their execution.

```
[task 0 100000]
[task 0 100001]
[task 0 100002]
[task 1 200000]
[task 1 200001]
[task 0 100003]
[task 0 100004]
[task 1 200002]
[task 0 100005]
[task 0 100006]
[task 0 100007]
[task 1 200003]
[task 0 100008]
[task 0 100009]
[task 2 300000]
[task 0 100010]
[task 0 100011]
[task 0 100012]
[task 1 200004]
[task 2 300001]
[task 0 100013]
[task 0 100014]
[task 0 100015]
[task 1 200005]
```