Real Time Systems, Assignment 2
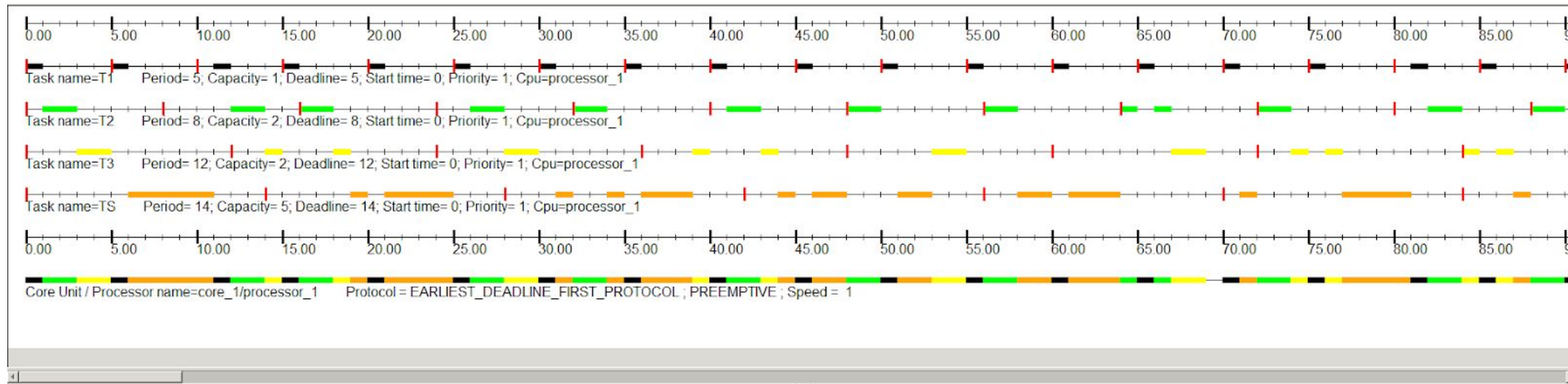
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Task 1:

T1(5,1), T2(8,2), T3(12,2), Ts(14,5)

Taking the budget of the sporadic server as 5, and period as 14, Total utilization = (1/5) + (2/8) + (2/12) + (5/14) = 0.973 (b/w 0.95 and 1)

Considering the sporadic server also as a periodic job, EDF schedule using the cheddar:

Scheduling simulation, Processor processor_1 :
- Number of context switches : 532
- Number of preemptions : 130

- Task response time computed from simulation :
    T1 => 2/worst
    T2 => 6/worst
    T3 => 10/worst
    TS => 12/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

Task 2

EDF schedule for the sporadic server considering aperiodic jobs(r,e): A1(1,3), A2(8, 12), A3(20, 23), A4(28, 33).

T1(5,1), T2(8,2), T3(12,2), Ts(14,5)
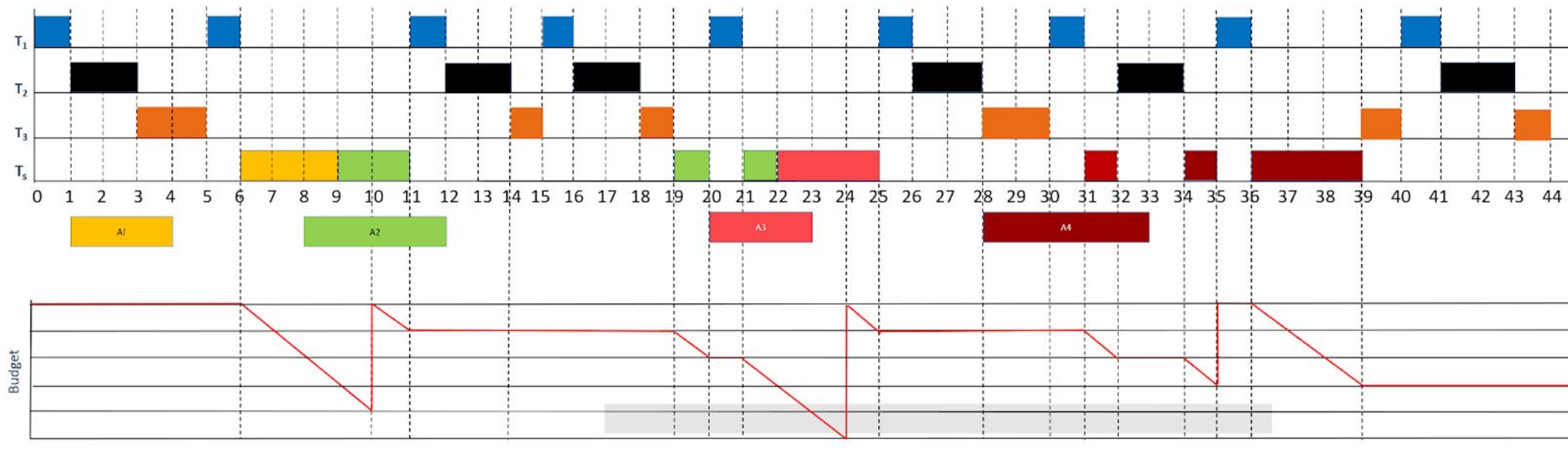
At t=6

Using R2 a(i) , $t_e = t_r = 0$. So next $t_r = t_e + p_s = 0 + 14 = 14$

At t=10

The system is in an idle interval from 6-10 and T1 arrives at 10, ending the idle interval, So using R3(b), The Budget is replenished.

For next t_r : using R2 b(i) t_e = t_r = 10, and next t_r = 10 + 14 = 24

At t=24

Using R2 a(i) , t_e = t_r = 24. So next t_r = t_e + p_s = 24+ 14 = 38

At t=35

The system is in an idle interval from 34-35 and T1 arrives at 35, ending the idle interval, So using R3(b), The Budget is replenished.

For next t_r : using R2 b(i) t_e = t_r = 35, and next t_r = 35+ 14 = 49

Task 3

Response Times for the Aperiodic Jobs :

Aperiodic job	Release Time (r)	Completion Time (c)	Response Time (c-r)
A1	1	9	8
A2	8	22	14
A3	20	25	5
A4	28	39	11