

Q1-RM

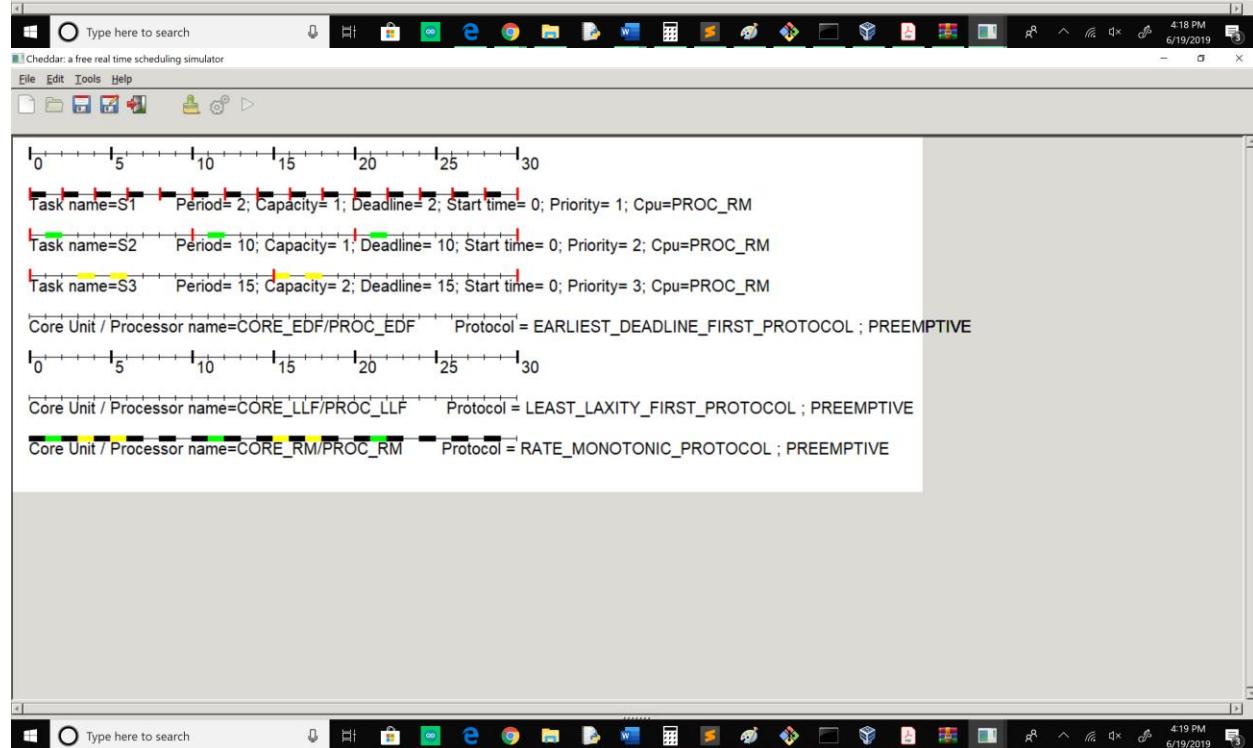
Cheddar: a free real time scheduling simulator

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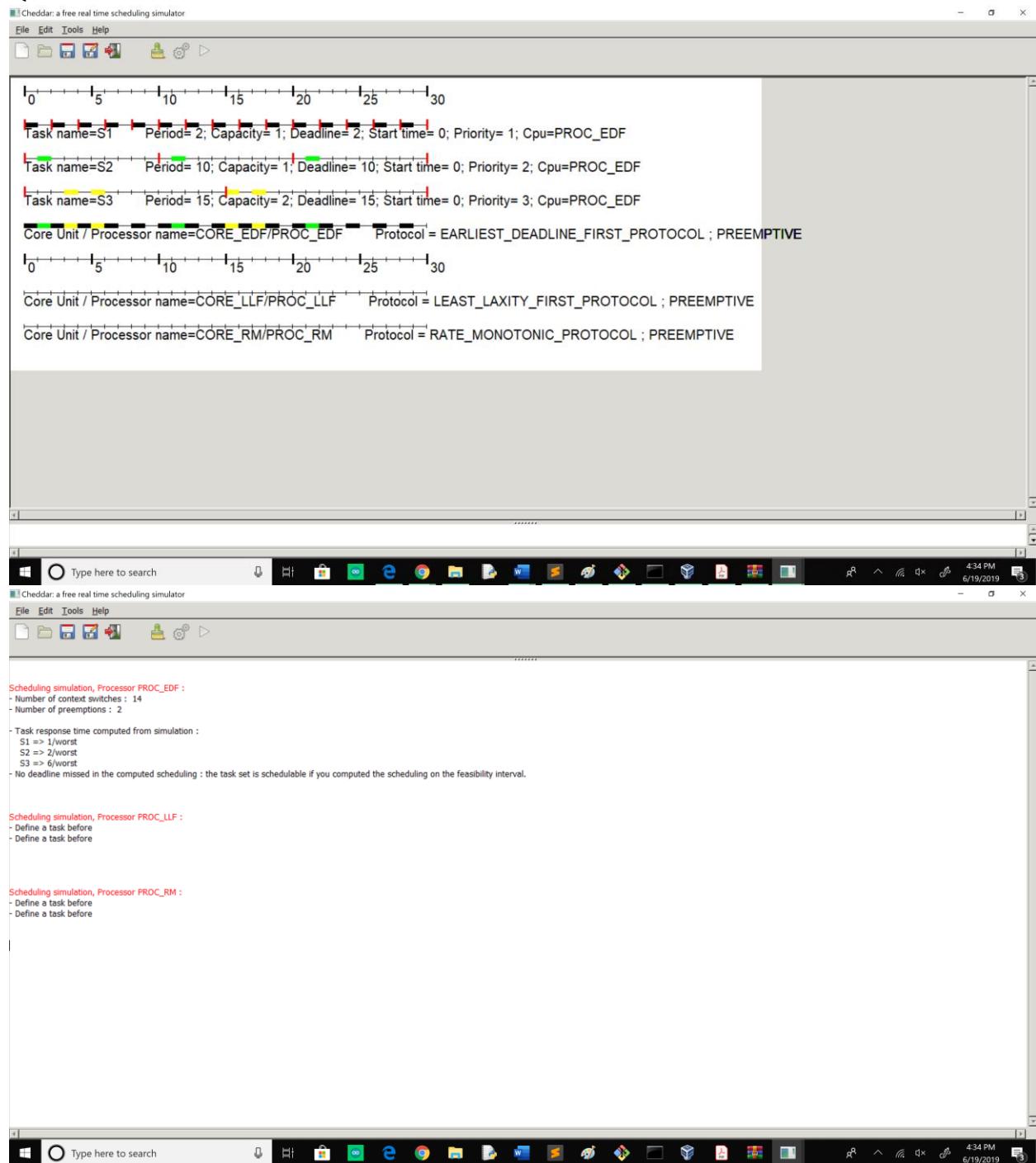
Scheduling simulation, Processor PROC_EDF :
- Define a task before
- Define a task before

Scheduling simulation, Processor PROC_LLF :
- Define a task before
- Define a task before

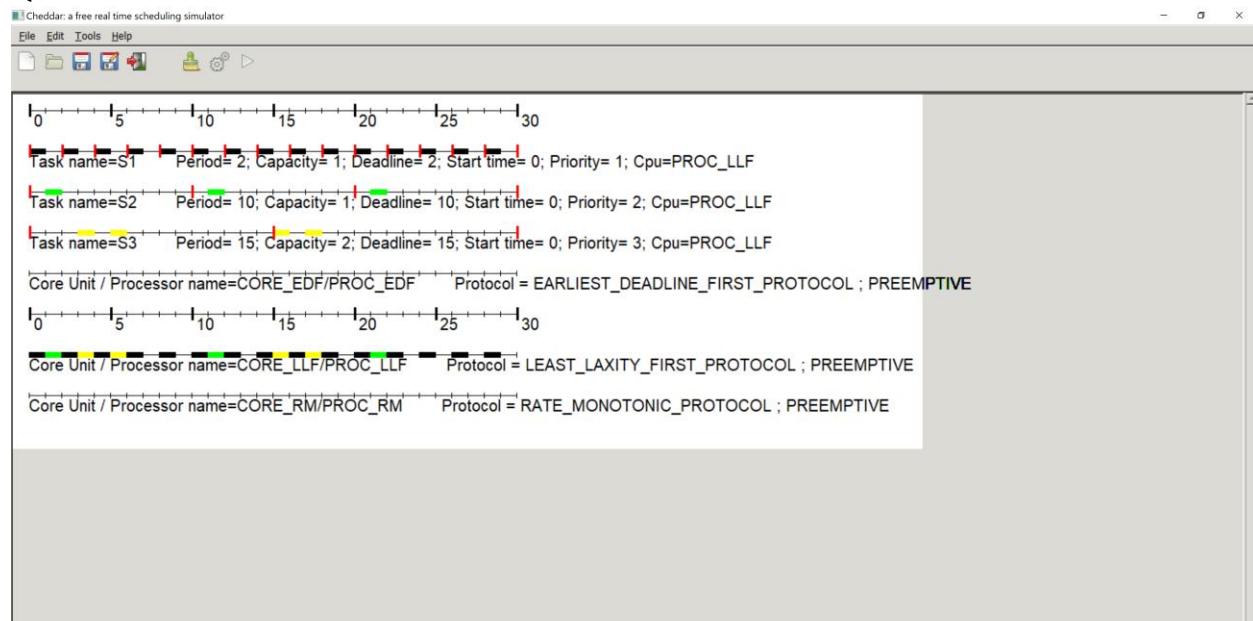
Scheduling simulation, Processor PROC_RM :
- Number of context switches : 14
- Number of preemptions : 2
- Task response time computed from simulation :
S1 => 1/worst
S2 => 2/worst
S3 => 6/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.



Q1-EDF



Q1-LLF



Scheduling simulation, Processor PROC_LLF :

- Number of context switches : 14
- Number of preemptions : 2

- Task response time computed from simulation :
S1 => 1/worst
S2 => 2/worst
S3 => 6/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

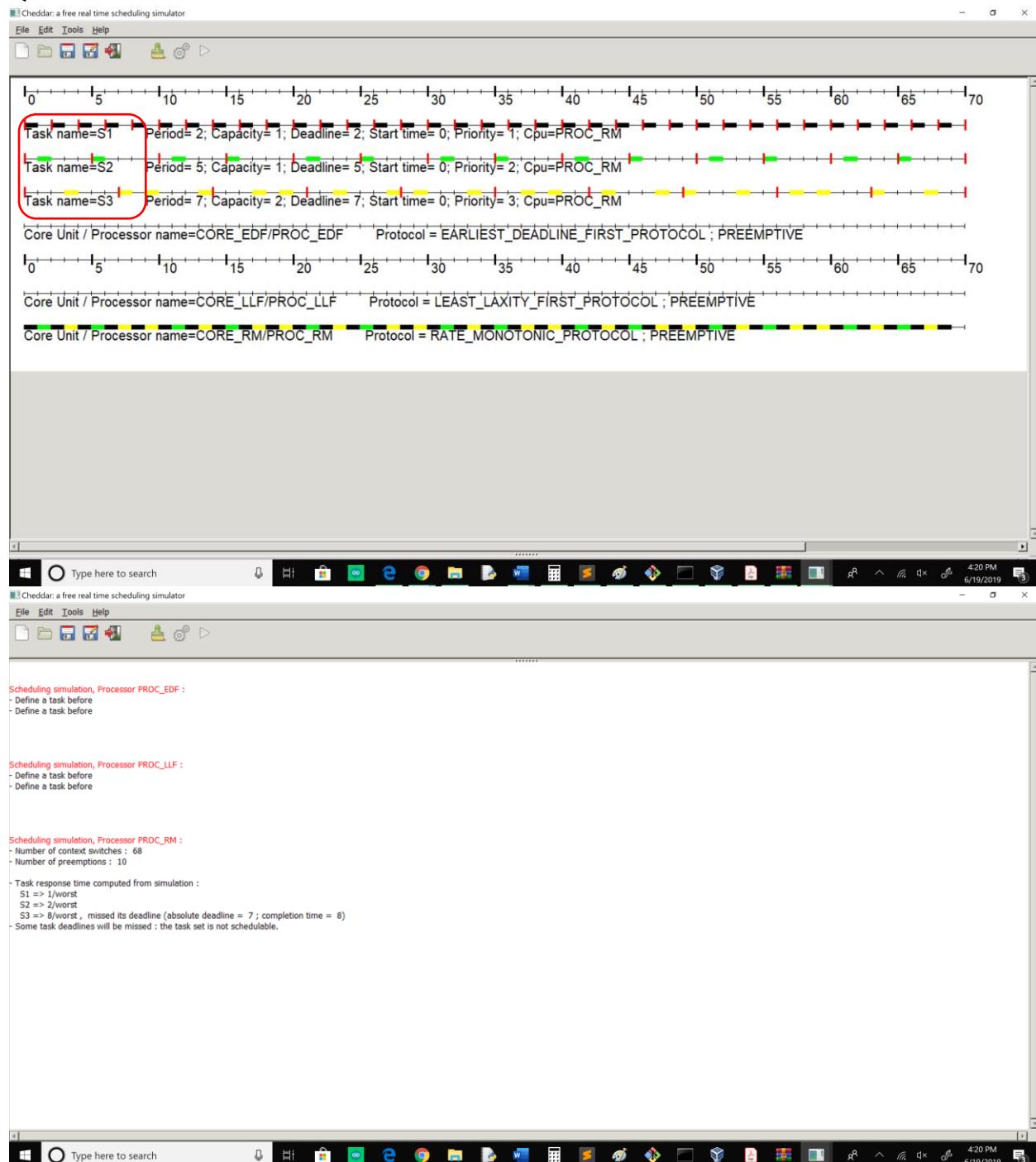
Scheduling simulation, Processor PROC_RM :

- Define a task before
- Define a task before



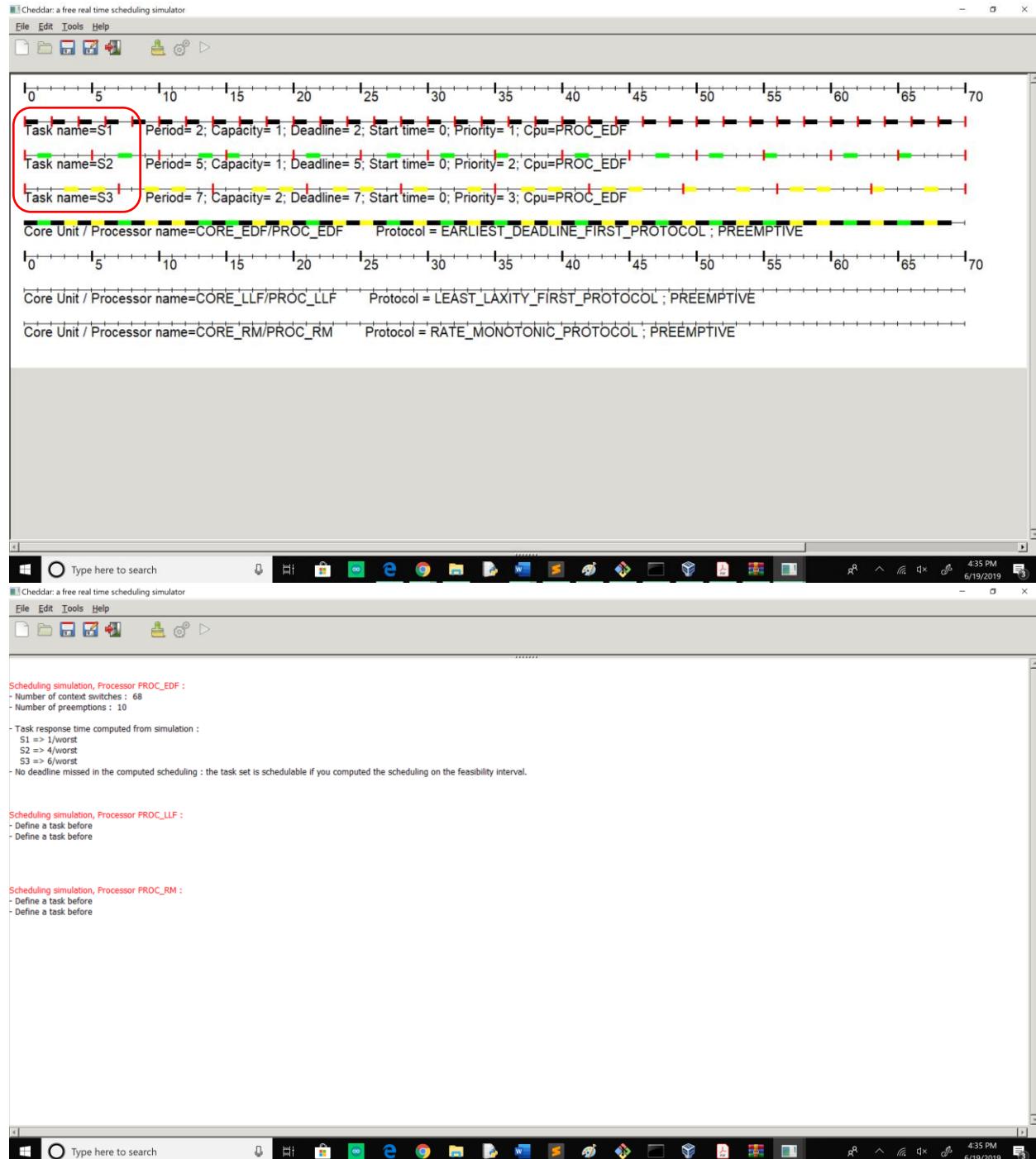
Ans: Implementation works successfully with all 3 scheduling mechanisms.

Q2-RM



Ans: The third task misses its deadline. In the time interval marked above, due to higher priority of S1 and S2, S3 is serviced only once before its deadline at instant 3-4. Since, S1 is processed every 2s and S2 at every 5s, processing of S3 is starved till 3s and by 7s it misses the deadline.

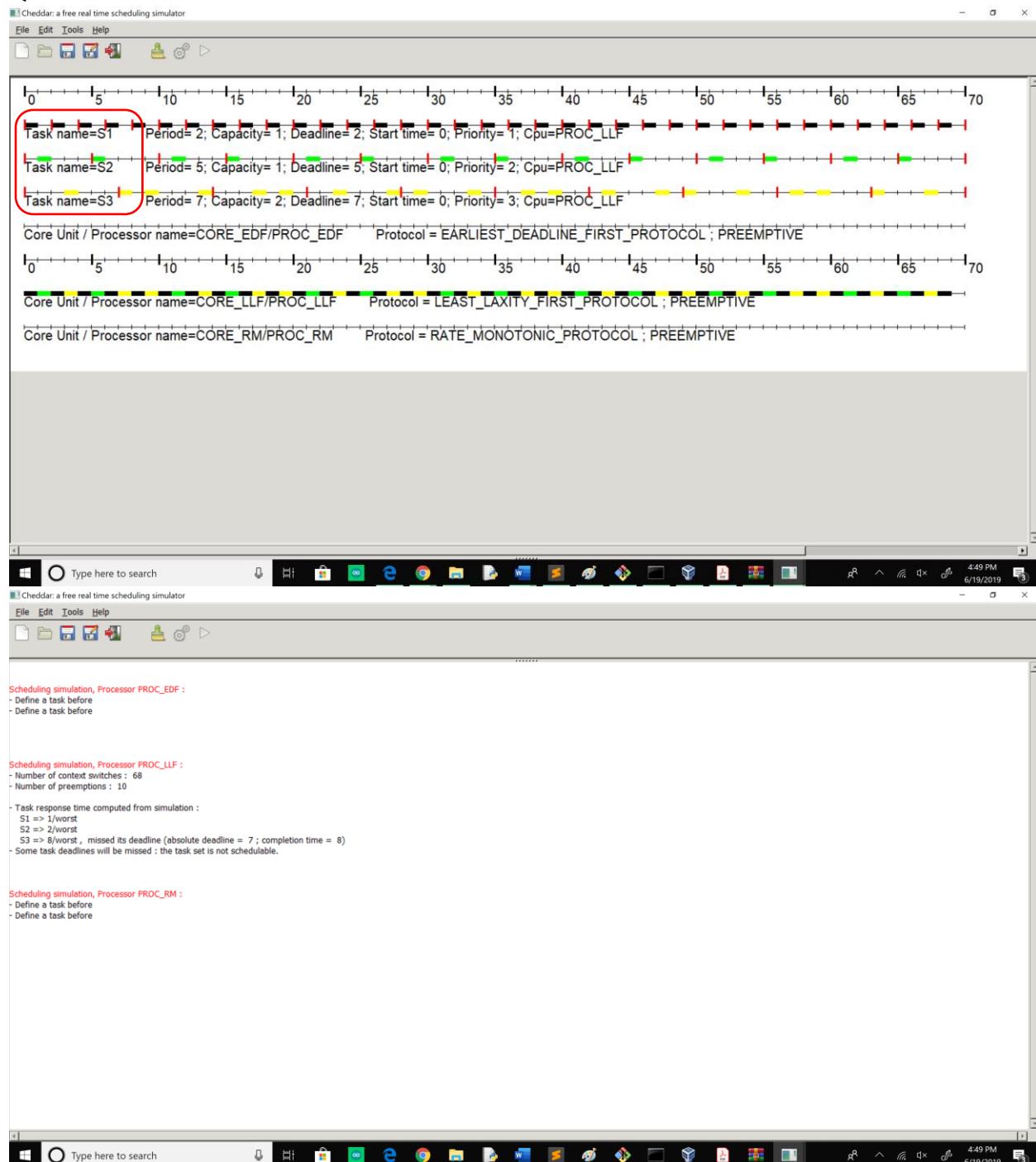
Q2-EDF



Ans: EDF was successful. Considering instant from 0 – 7s.

1. S1 has priority because it has the smallest deadline of 2s. Hence it is serviced first.
2. (1-2)s Now S2 has the second highest priority with deadline of 5s. Hence is serviced.
3. (2-3)Now, the deadline for S2 approaches again hence, it gets the highest priority and is serviced.
4. (3-4) S1 and S2 have been serviced so S3 is scheduled in this time instant.
5. (4-5) S1 is serviced again due to higher priority.
6. (5-6) S2 has already been serviced and S1 as well. Now S3 is serviced.
Similar behavior is carried out in the remaining time. Hence, all tasks are serviced before their deadlines.

Q2-LLF



Ans:

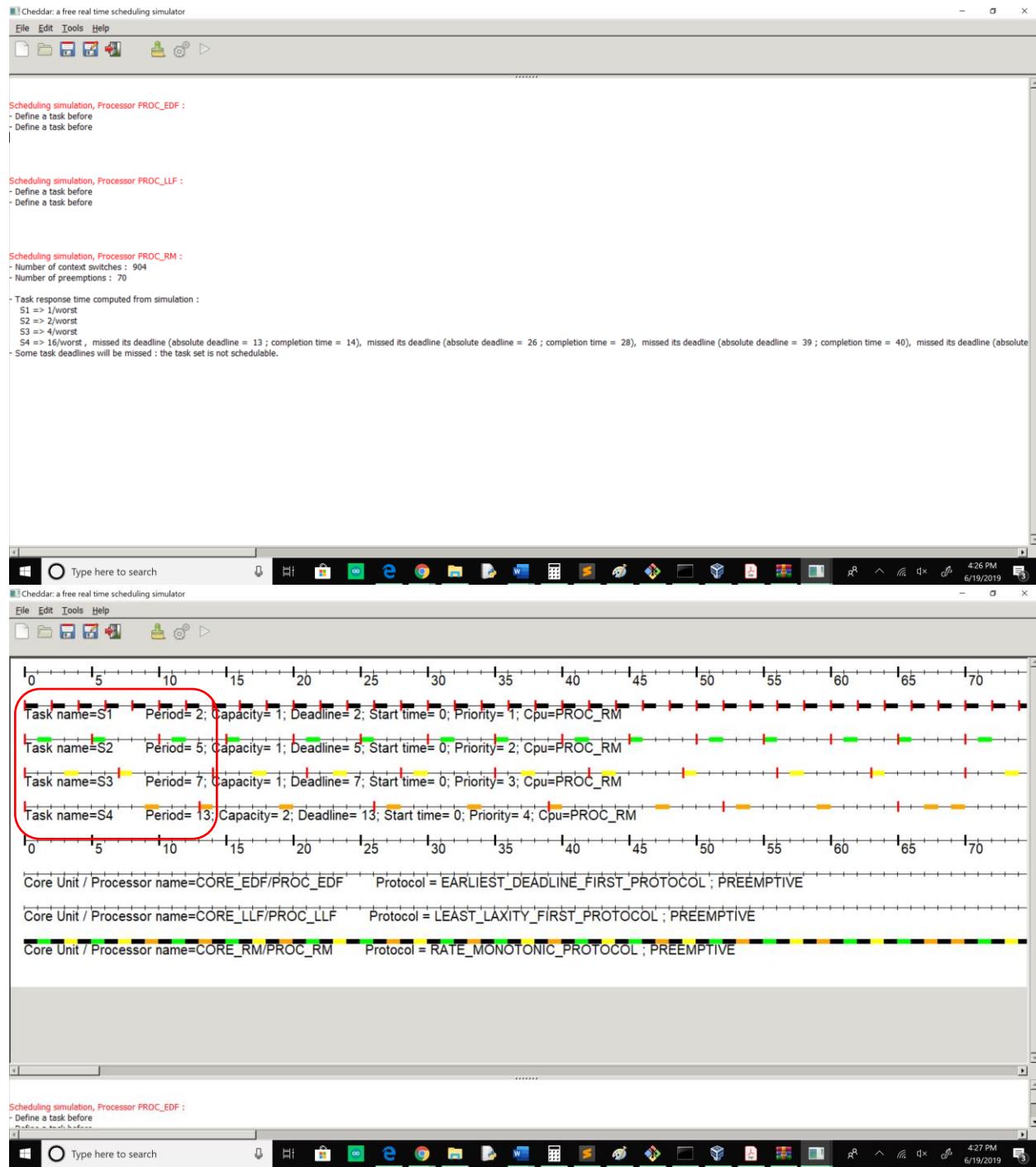
According to LLF, the task with the smallest difference between Deadline and Computation time is executed first. For given problem, For S1 => D1-C1 = 1; S2 => D2-C2 = 4; S3 => D3-C3 = 5.

Which gives S1 highest priority at start. Considering instant (0 -7s)

1. (1-2) Now that S1 is already serviced, S2 has second highest priority and is executed.
2. (2-3) Now S1 has the highest priority again it has completed before its deadline.

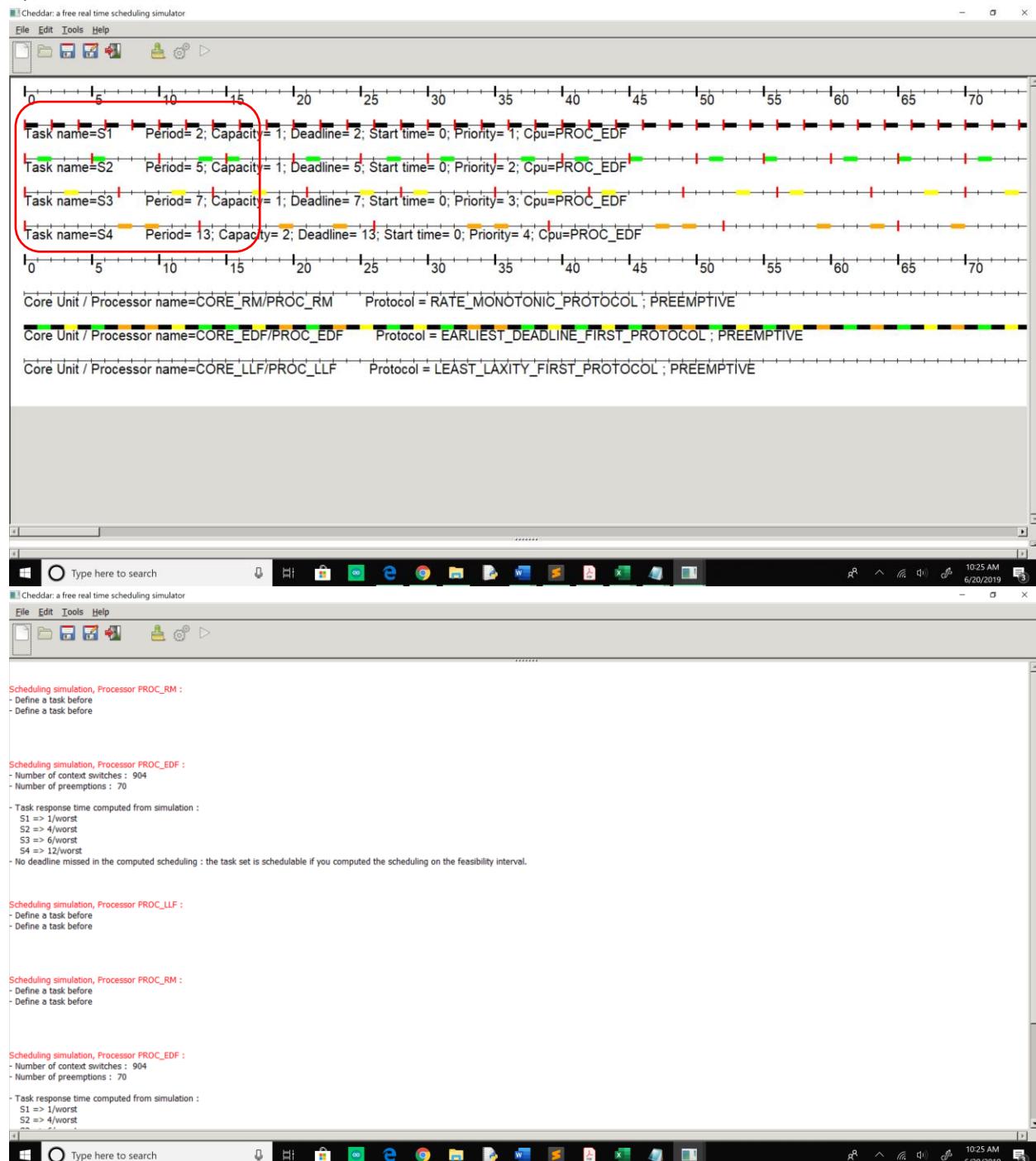
3. (3-4) Now S3 has highest priority since other tasks have finished completion before deadline.
4. (4-5) S1 is processed again.
5. (5-6) Now considering S2; $D2-C2 \Rightarrow (5-5)-1=-1$. For S3; $D3-C3 \Rightarrow (7-5)-2=0$. Hence, S2 gets higher priority.
6. (6-7) S1 is processed and S3 misses the deadline.
7. This pattern repeats till 7s. That's when S3 misses the deadline. This is because, in LLF consideration is given to difference between deadlines and computation time. Since, S1 has the smallest value, it was serviced at highest priority followed by S2 then S3. The issue arises in LLF when the computation.

Q3-RM



Ans: Till tasks S3 execution is normal. However due to priority given to fastest execution time first, S4 is serviced only at instant (9-10) before deadline. The next time it executes, it has already missed a deadline this trend carries over till 910s.

Q3-EDF



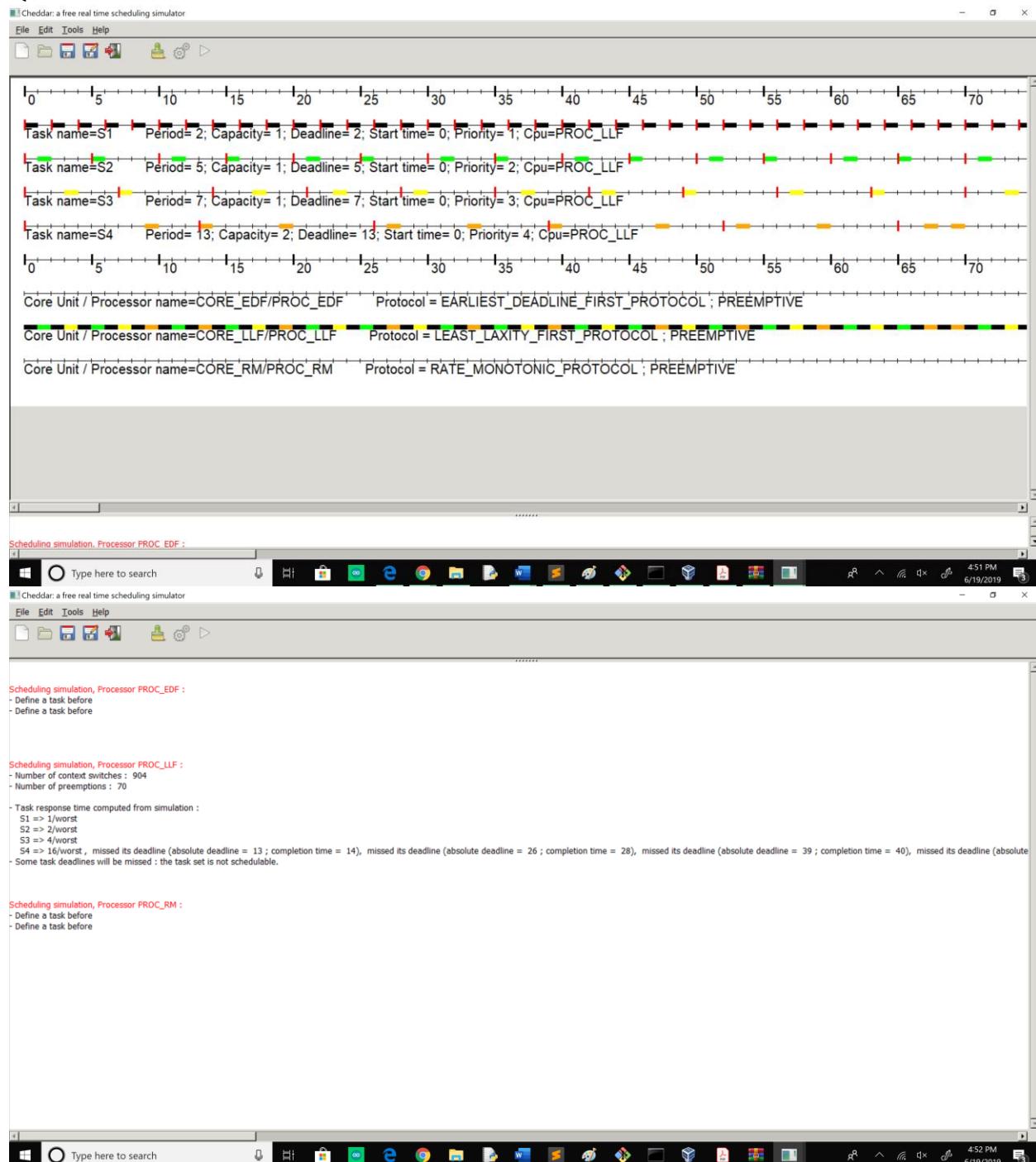
Ans: EDF was successful. Considering instant from 0 – 13s.

1. S1 has priority because it has the smallest deadline of 2s. Hence it is serviced first.

2. (1-2)s Now S2 has the second highest priority with deadline of 5s. Hence is serviced.
3. (2-3)Now, the deadline for S2 approaches again hence, it gets the highest priority and is serviced.
4. (3-4) S1 and S2 have been serviced so S3 is scheduled in this time instant.
5. (4-5) S1 is serviced again due to higher priority.
6. (5-6) S2 is now the highest priority since S1,S2 have been serviced and S3 and S4 remain.
7. (6-7) S1 is serviced due to earliest deadline.
8. (7-8) S4 is serviced because all other tasks have completed before their deadline at this instant.
9. (8-9) S1 executes.
10. (9-10) Earliest deadline is for S4 at this point and hence is executed.

Similar behavior is carried out in the remaining time. Hence, all tasks are serviced before their deadlines.

Q3-LLF

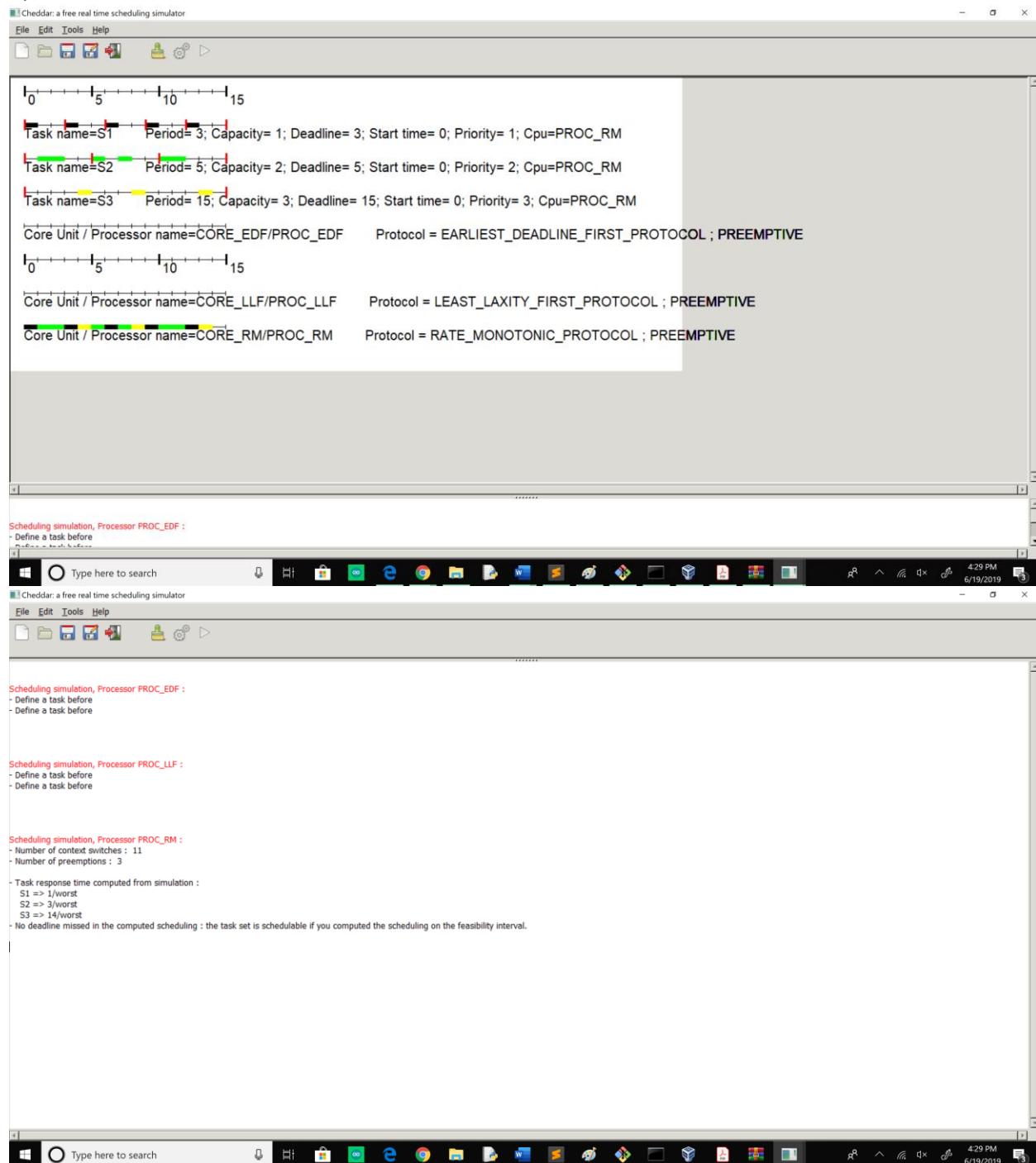


Ans: LLF is applied successfully despite the erroneous report generated by Cheddar. This is because at 11s, by LLF criteria which suggests Di-Ci, we can see the following:

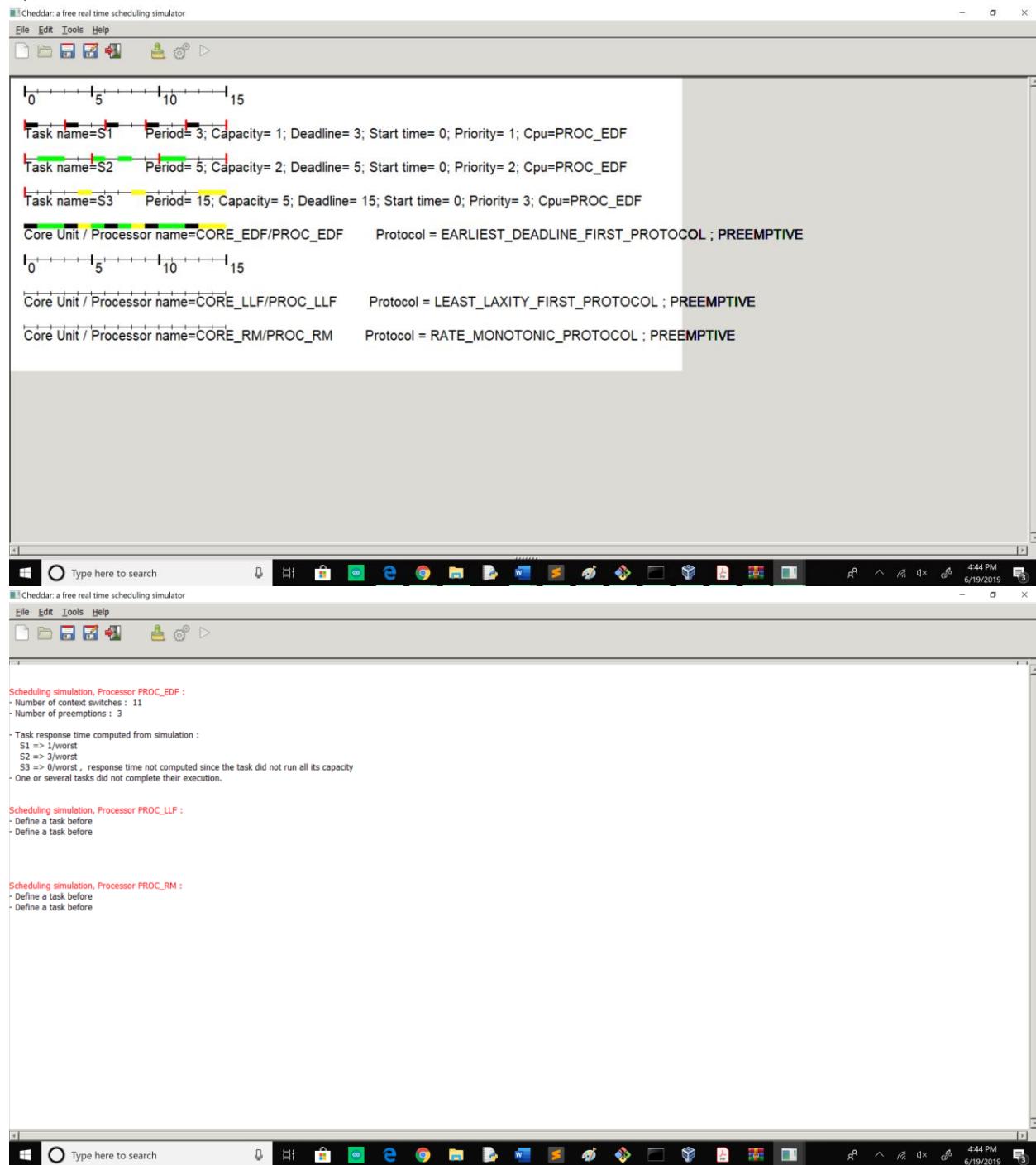
For S2; $(15-10)-1 = 4$.

For S4; $(13-10)-2 = 1$. Which suggests S4 should be executed first.

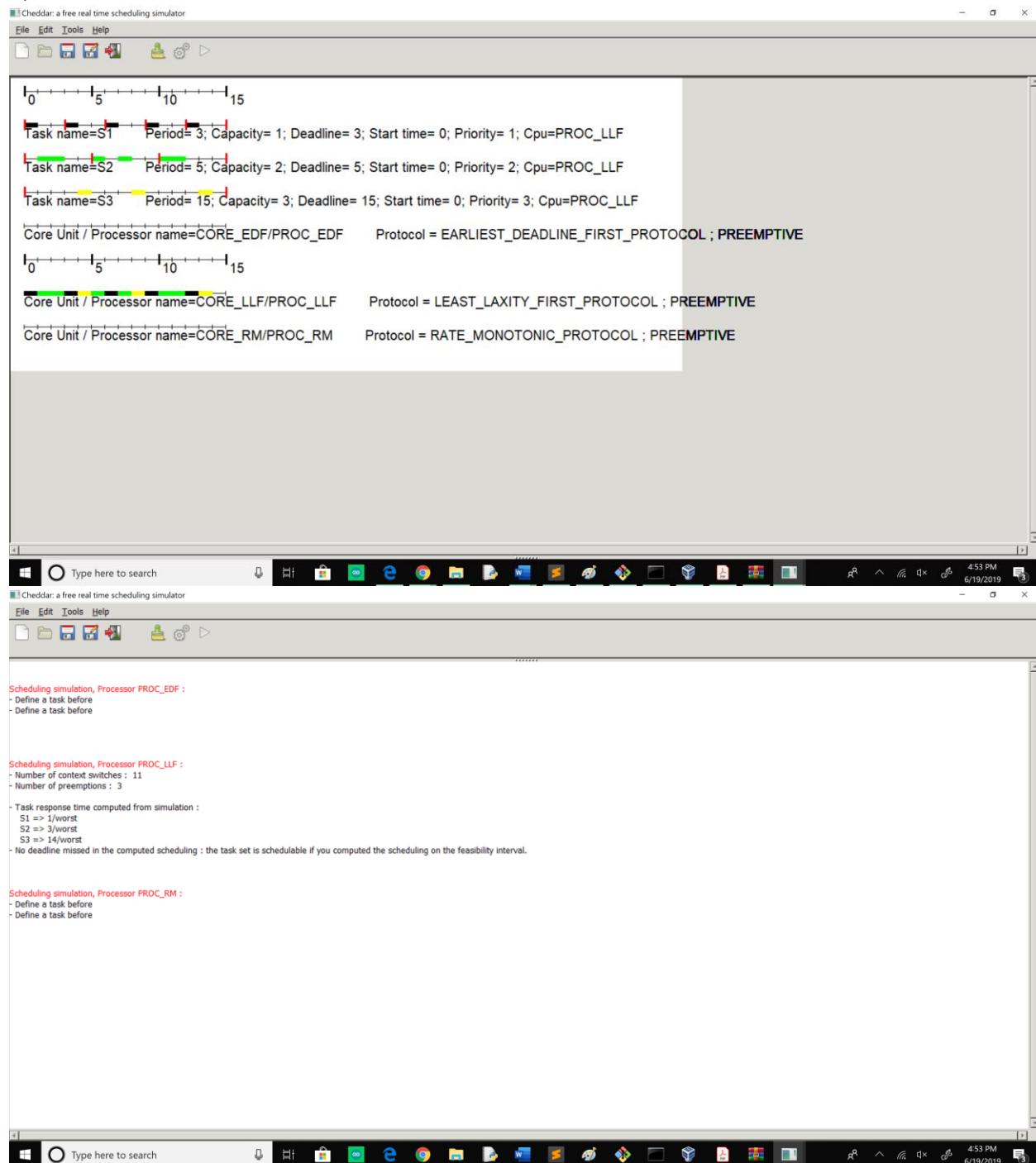
Q4-RM



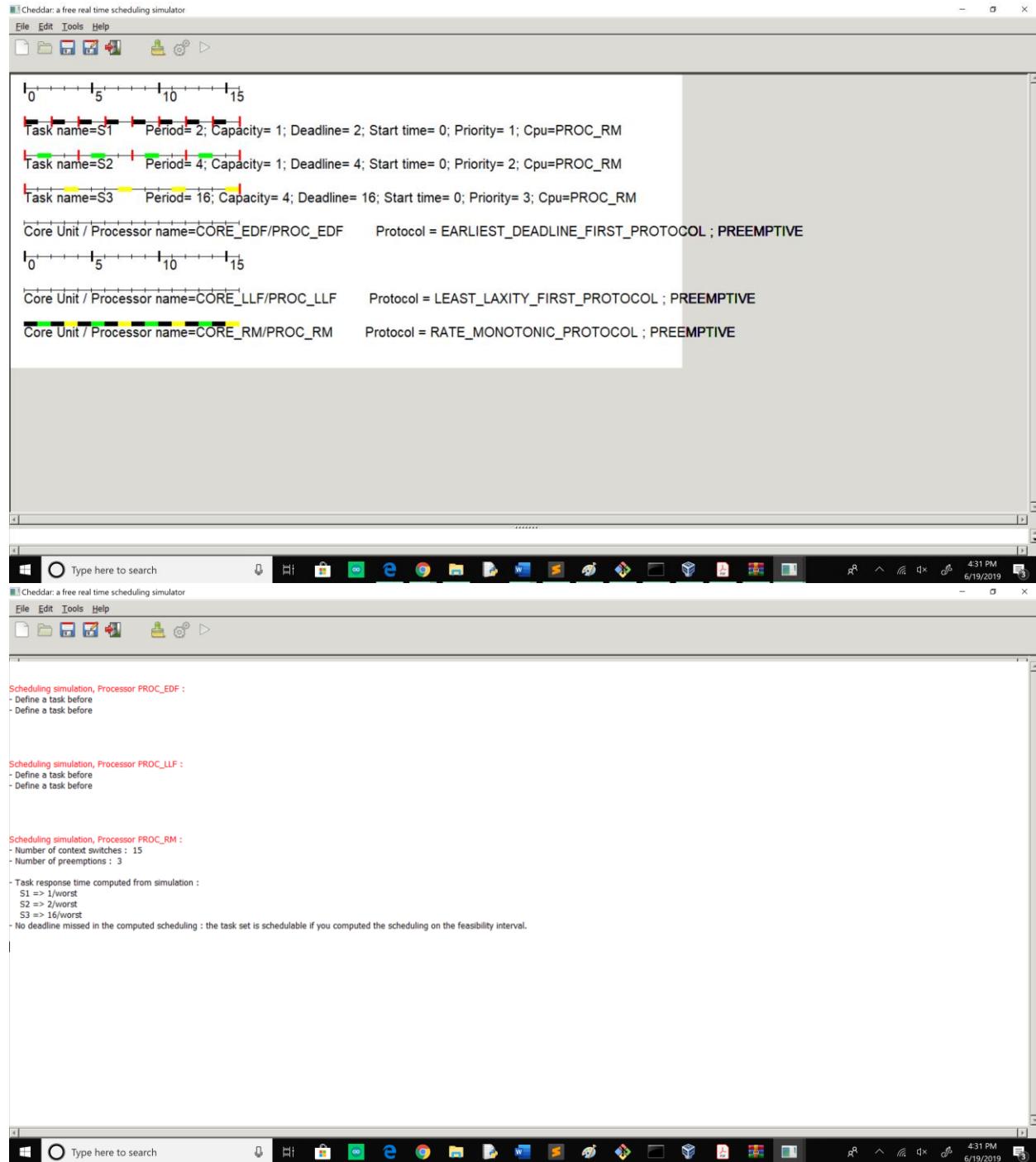
Q4-EDF



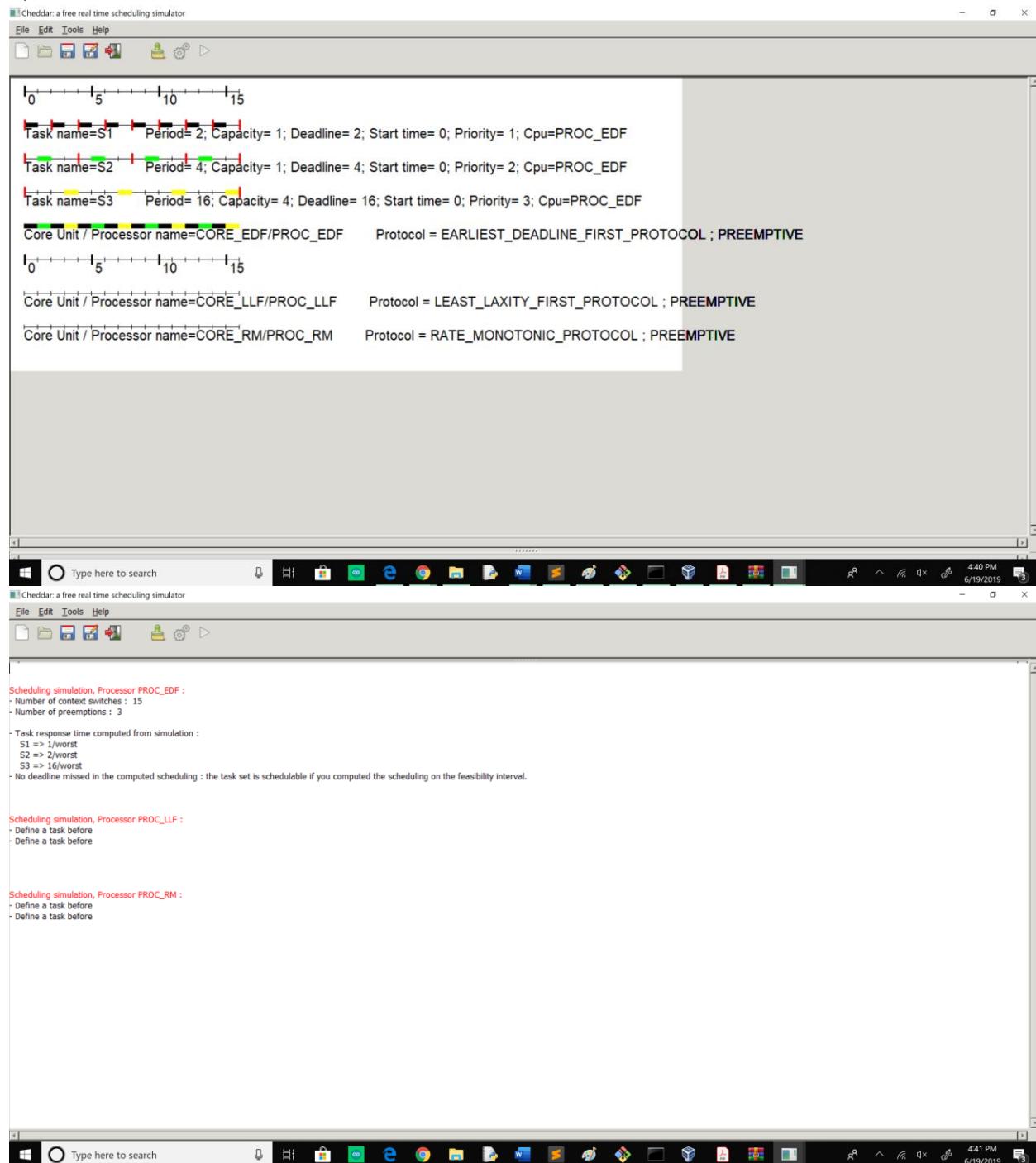
Q4-LLF



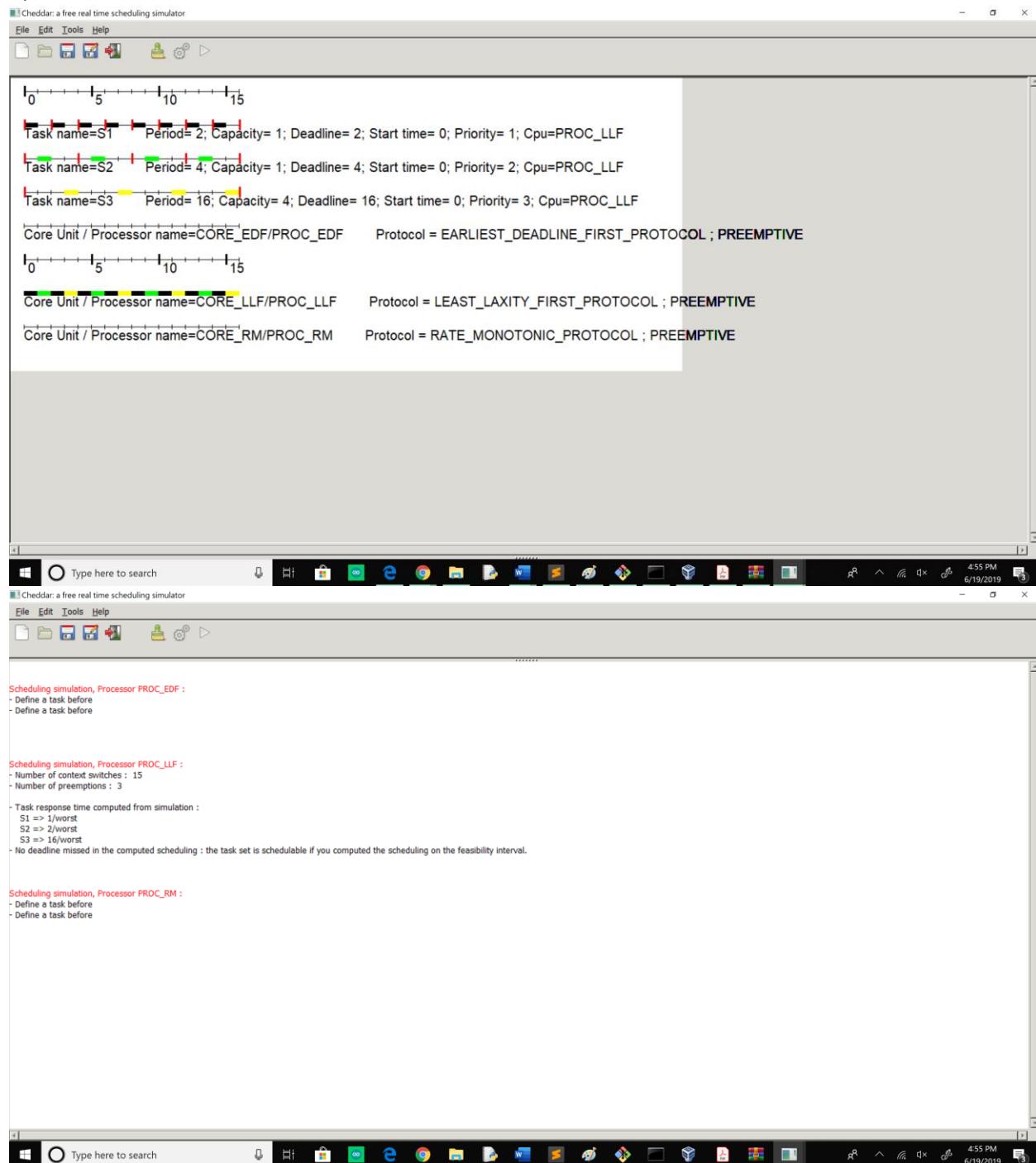
Q5-RM



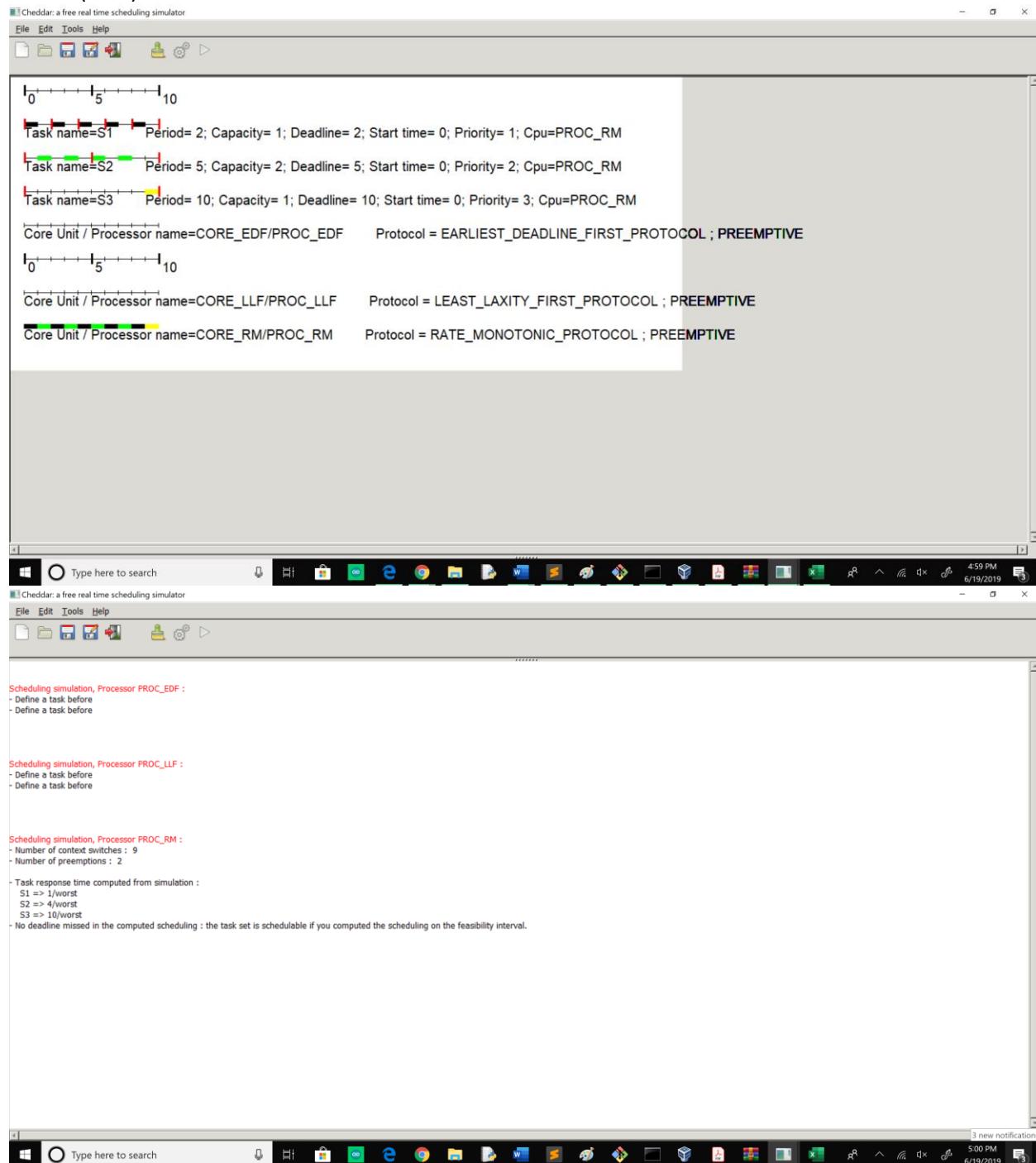
Q5-EDF



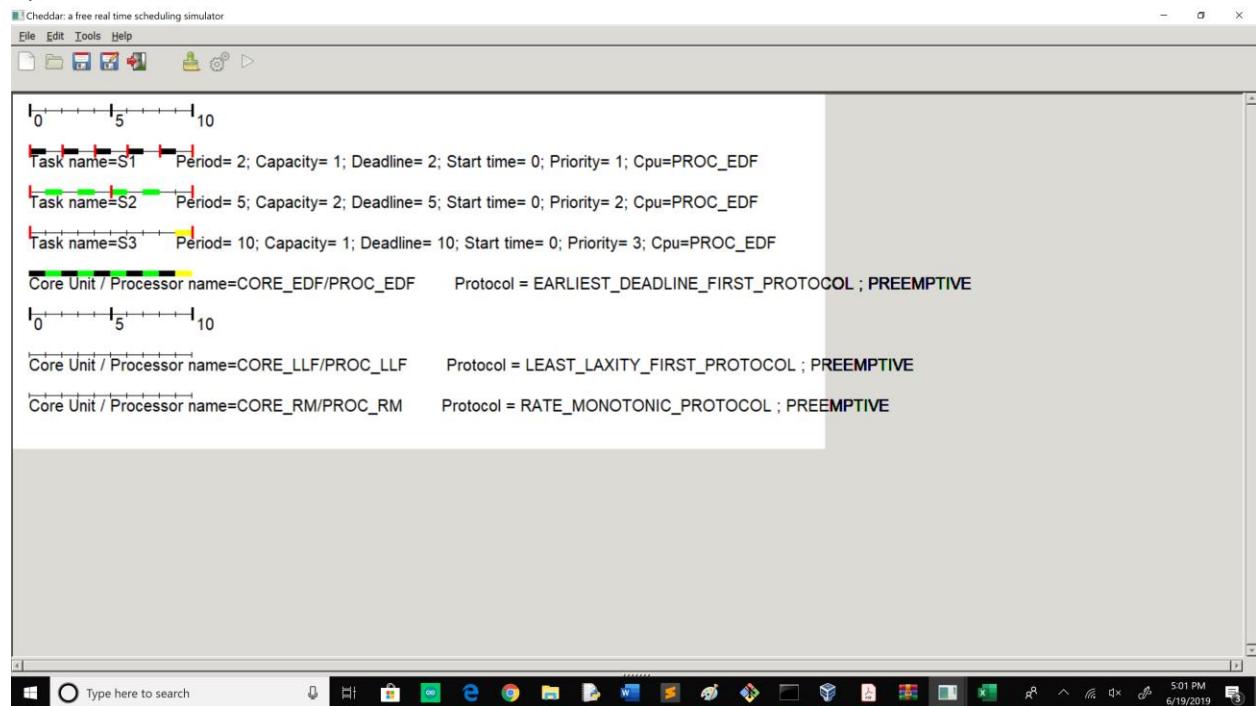
Q5-LLF

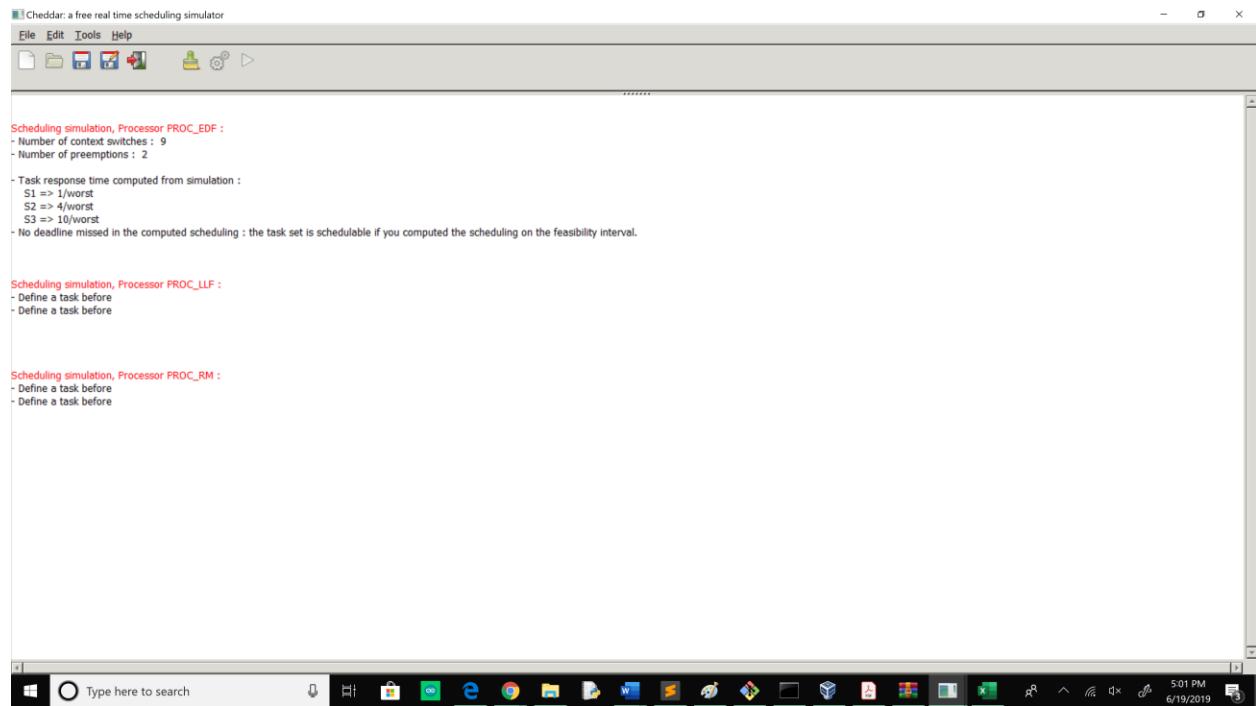


Q6-RM(EX-5)

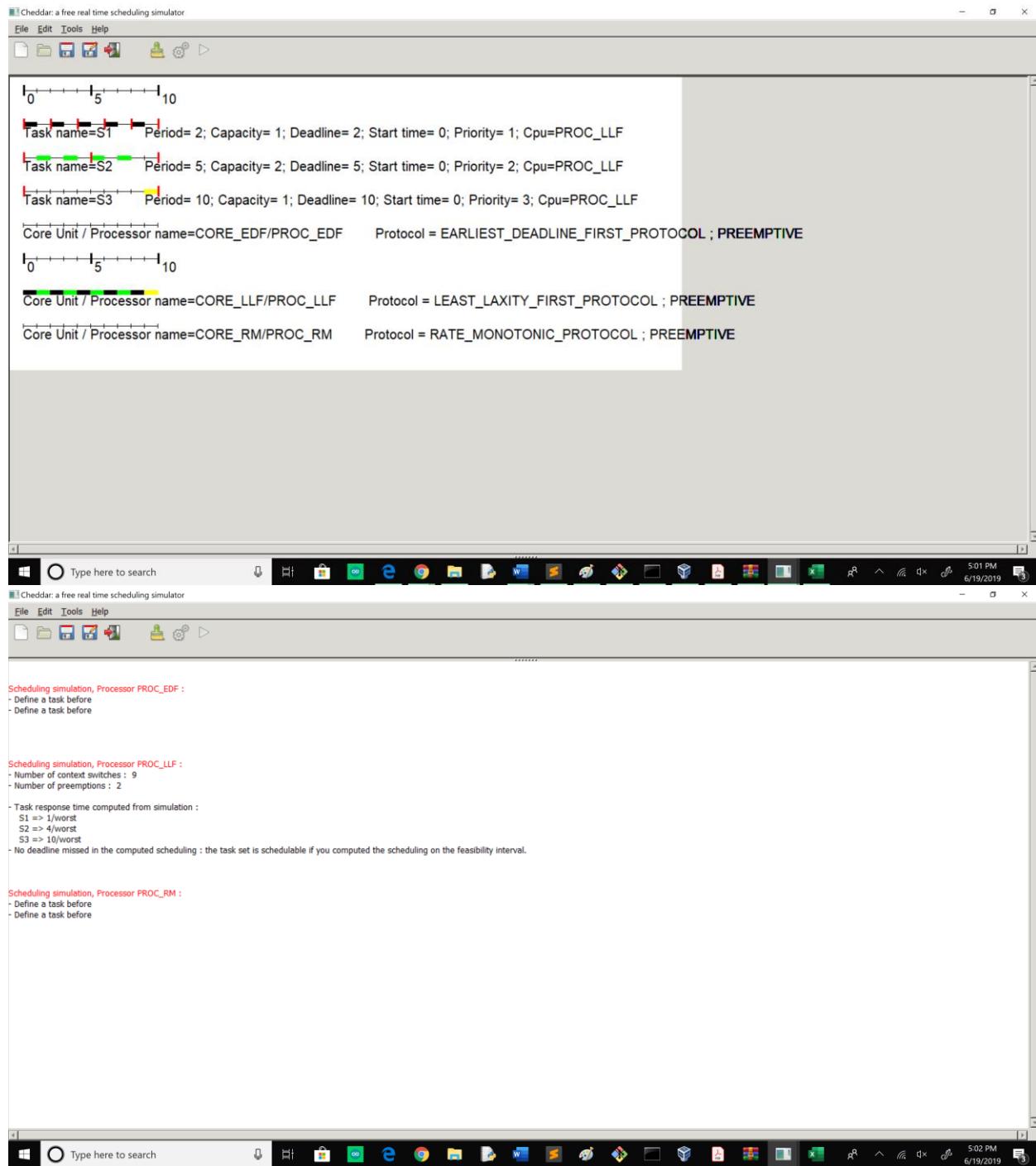


Q6-EDF

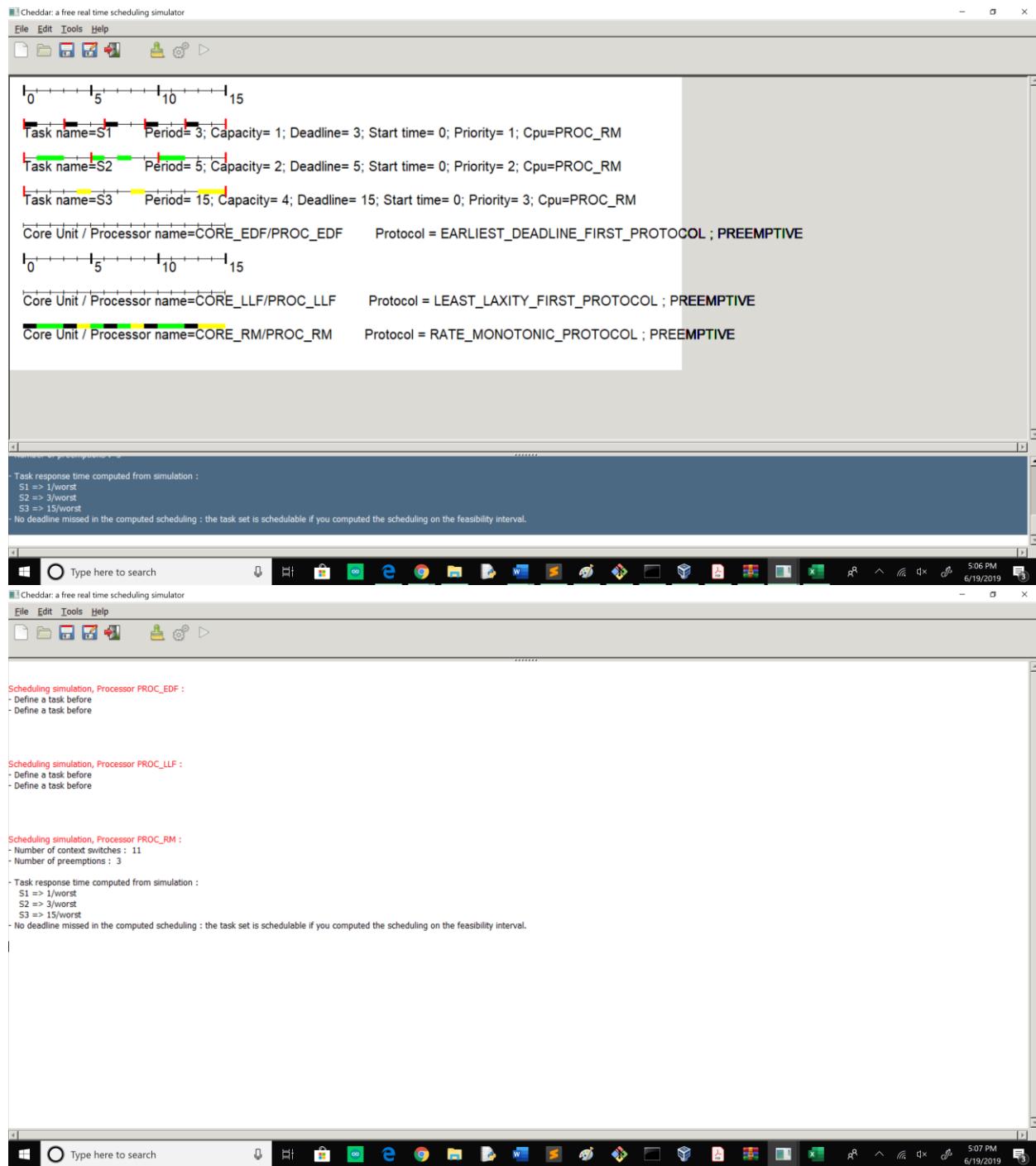


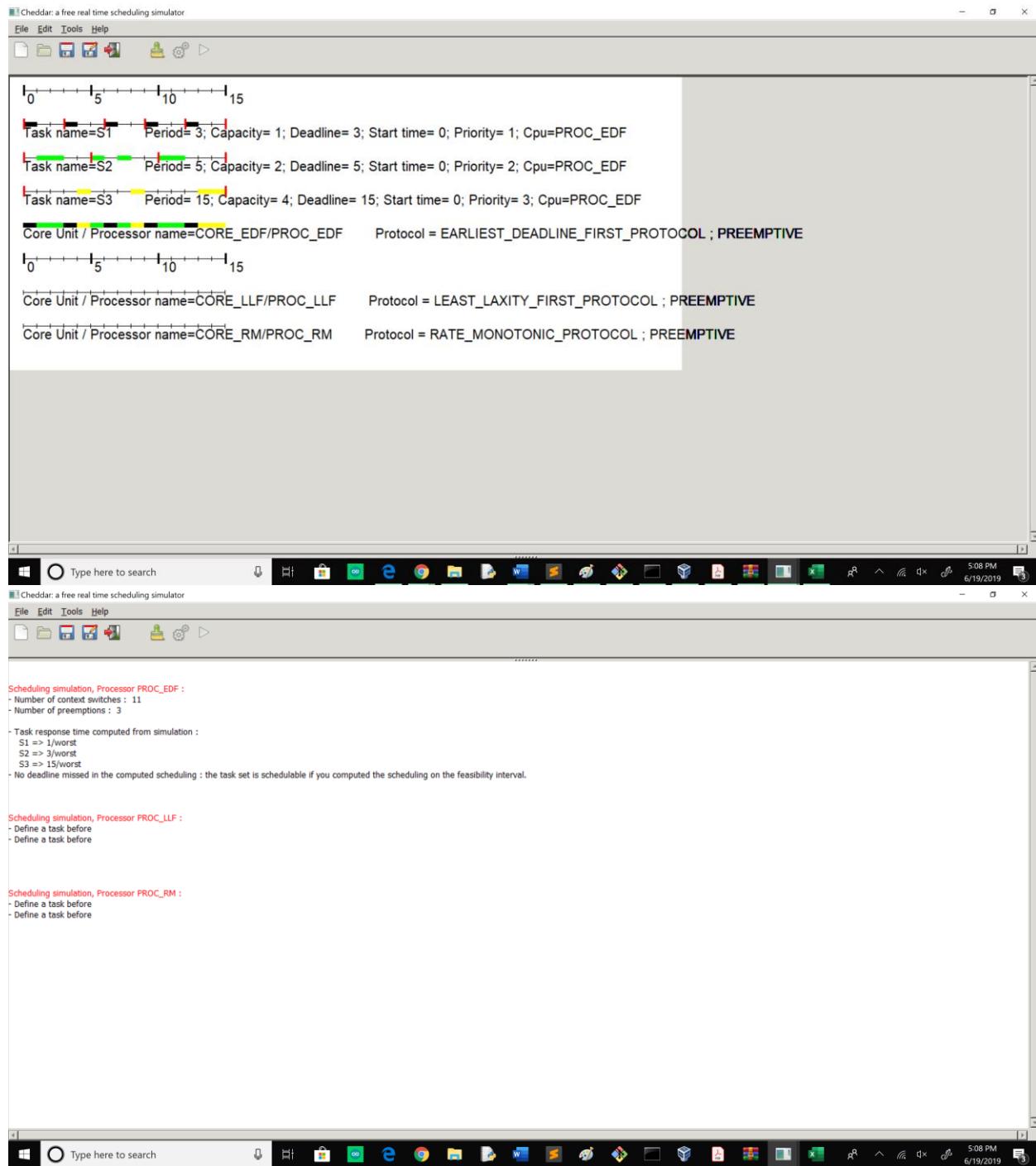


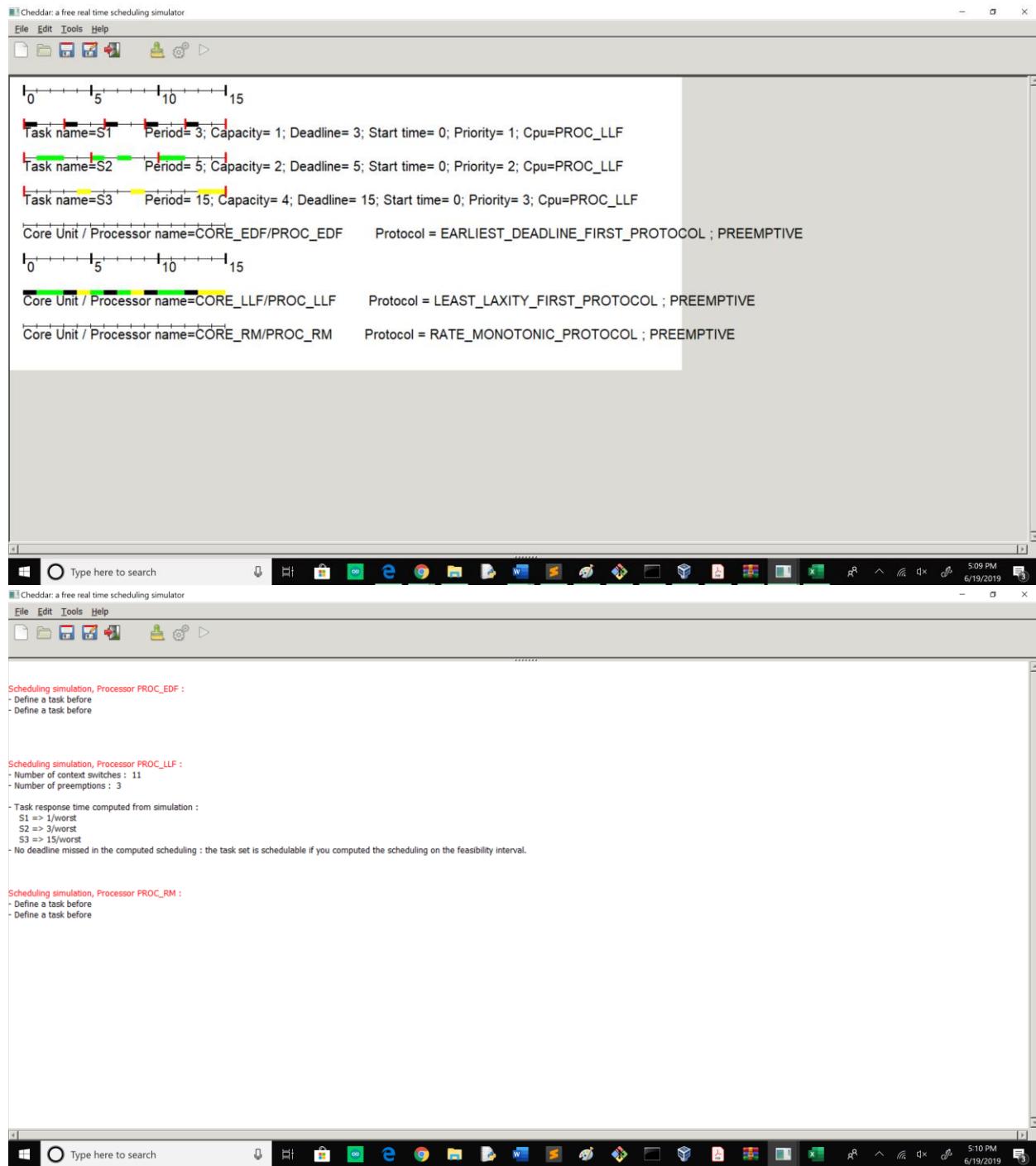
Q6-LLF



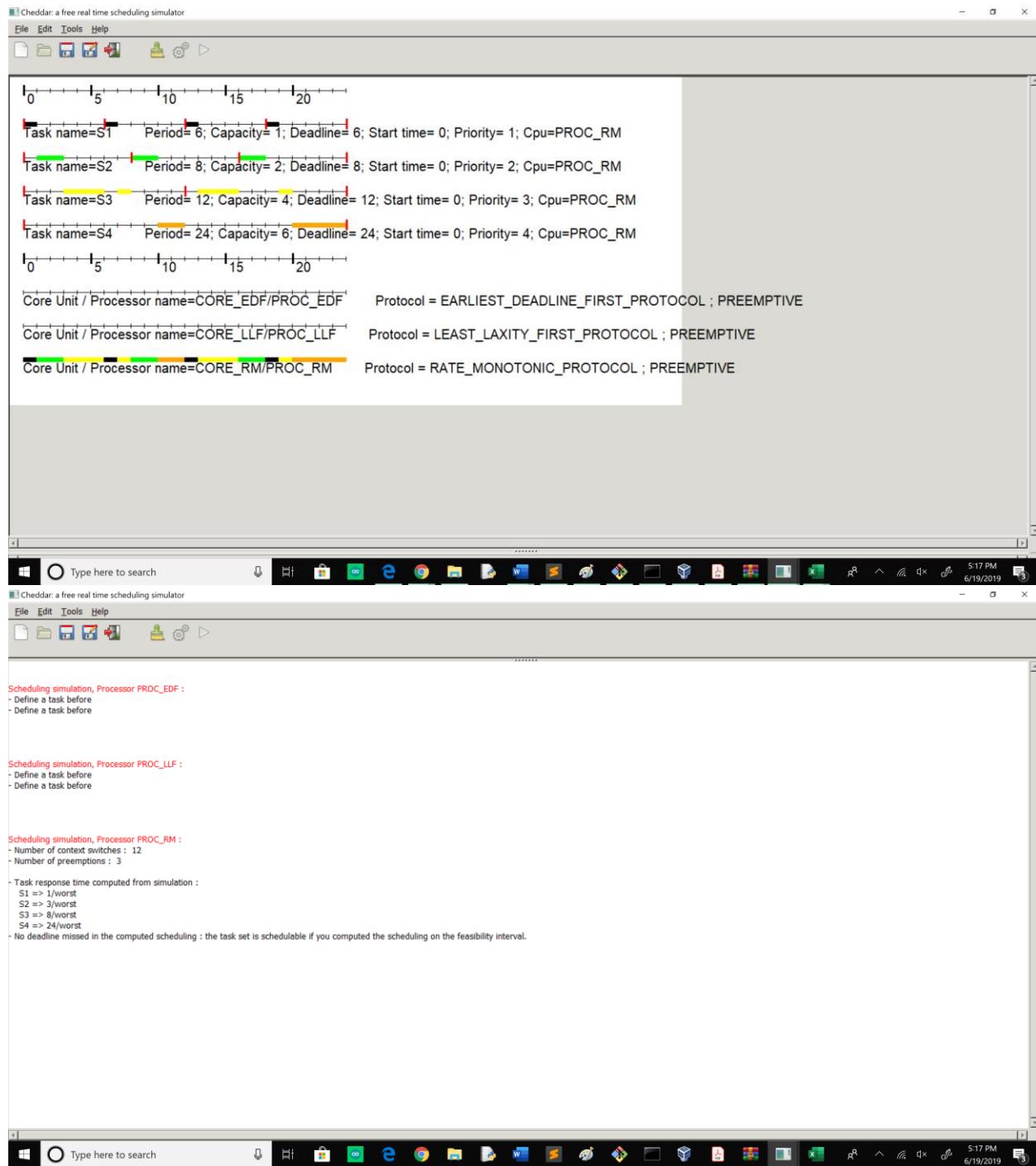
Q7-RM(Example 7)



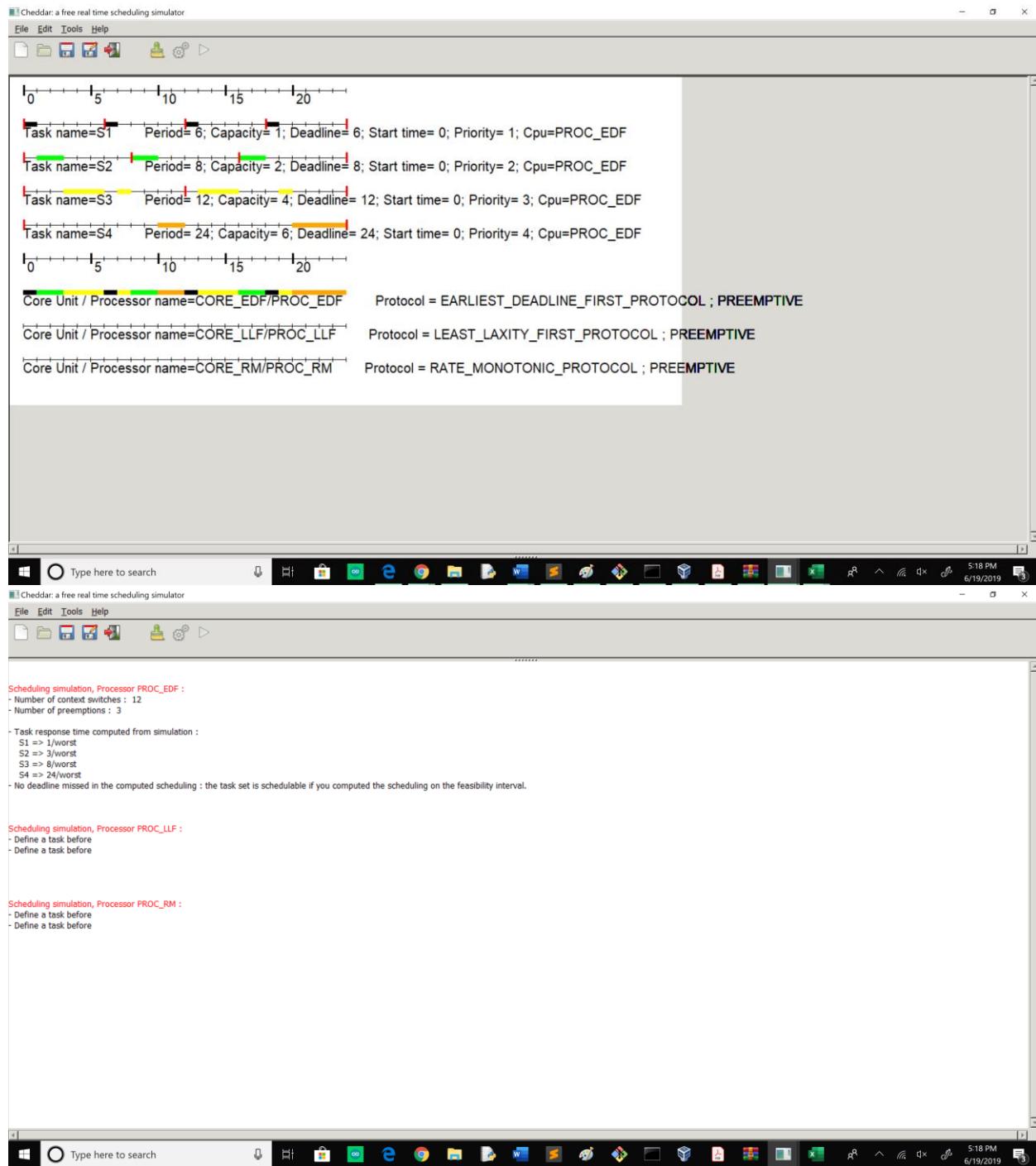


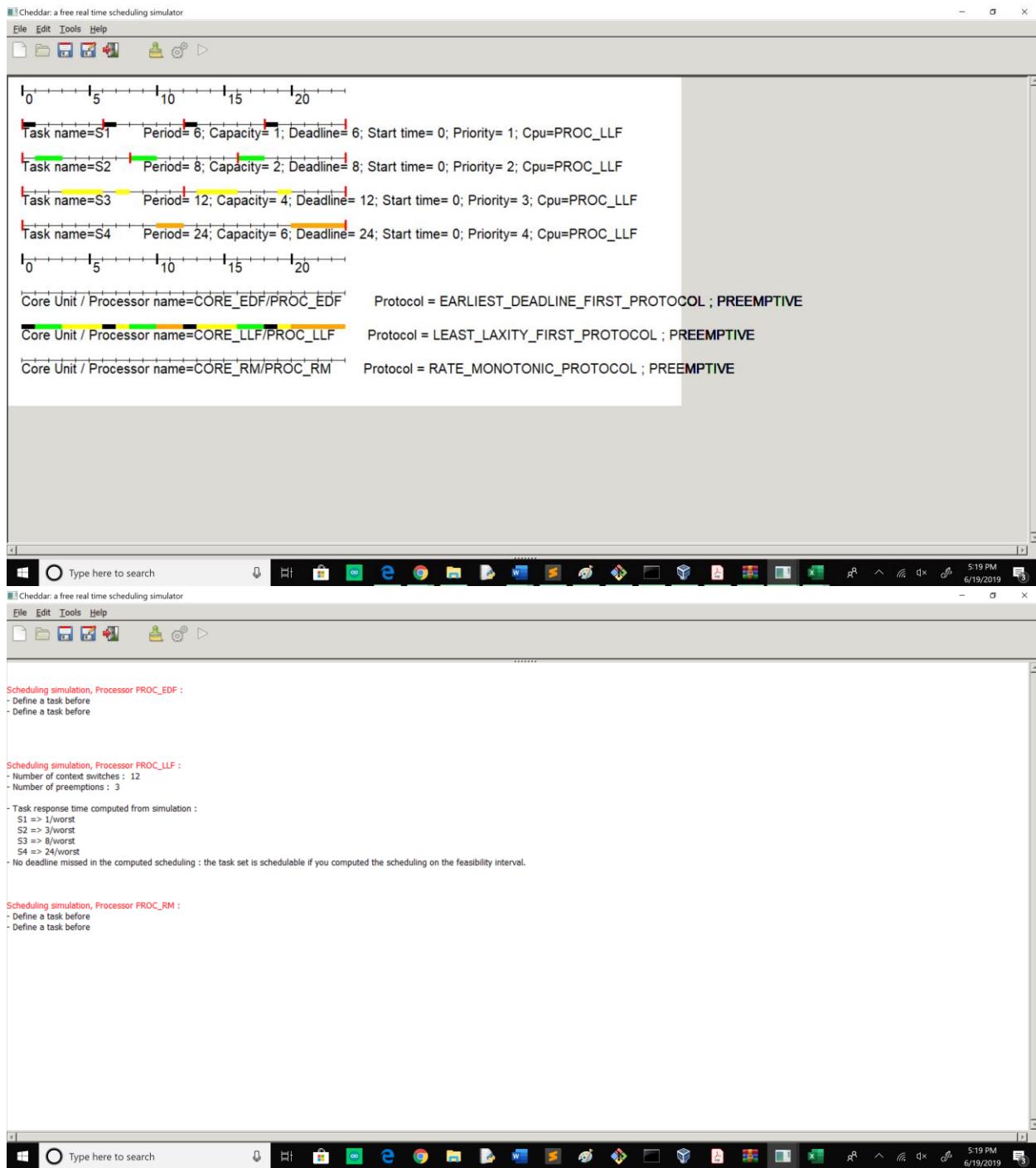


Q8-RM(EX-9)

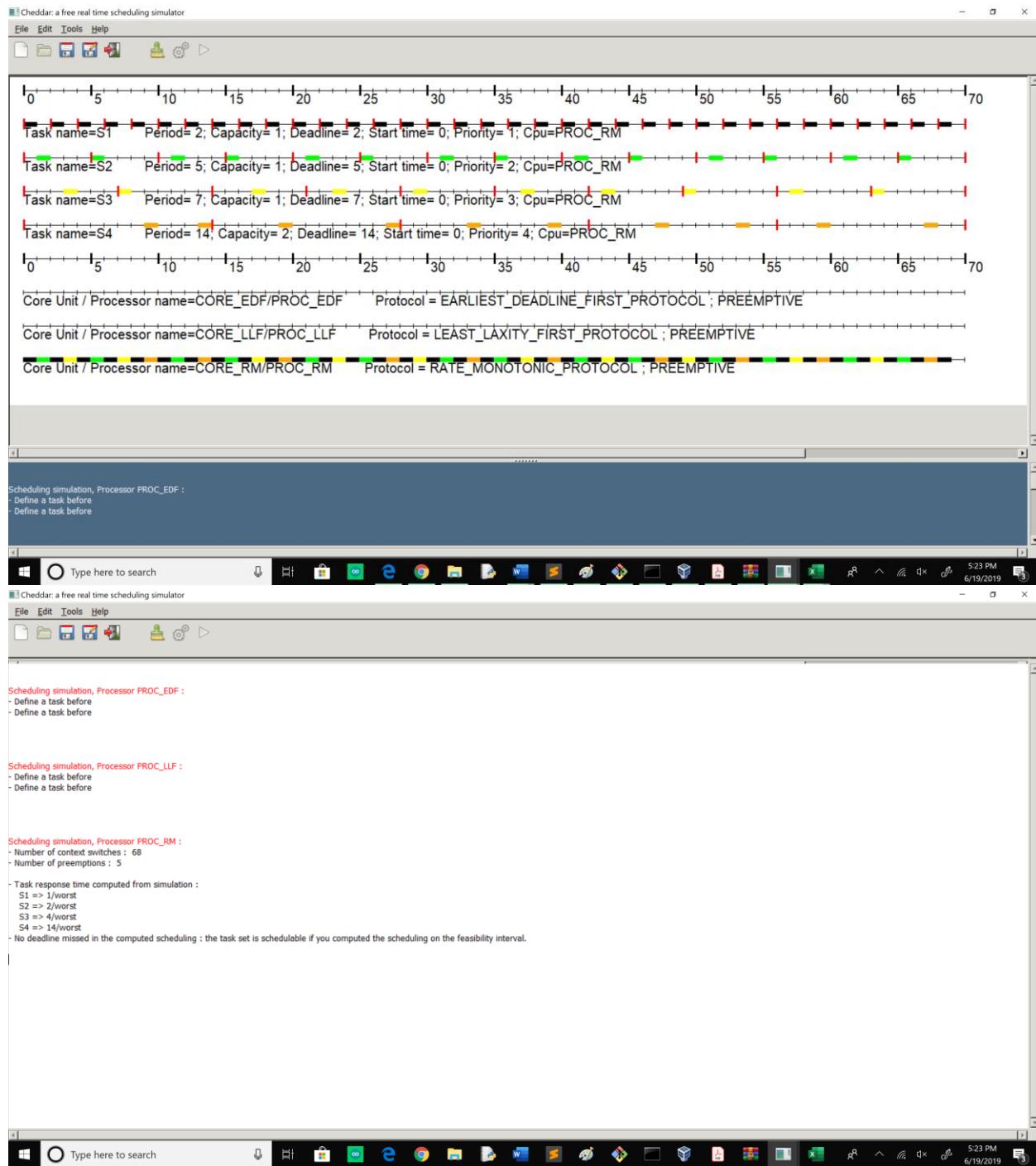


Q8-EDF





Q9-RM(EX-10)



Q9-EDF



Scheduling simulation, Processor PROC_EDF :

- Number of context switches : 68
- Number of preemptions : 5

- Task response time computed from simulation :

- S1 => 1/worst
- S2 => 4/worst
- S3 => 4/worst
- S4 => 12/worst

- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

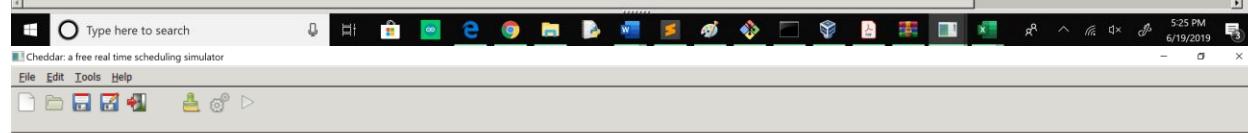
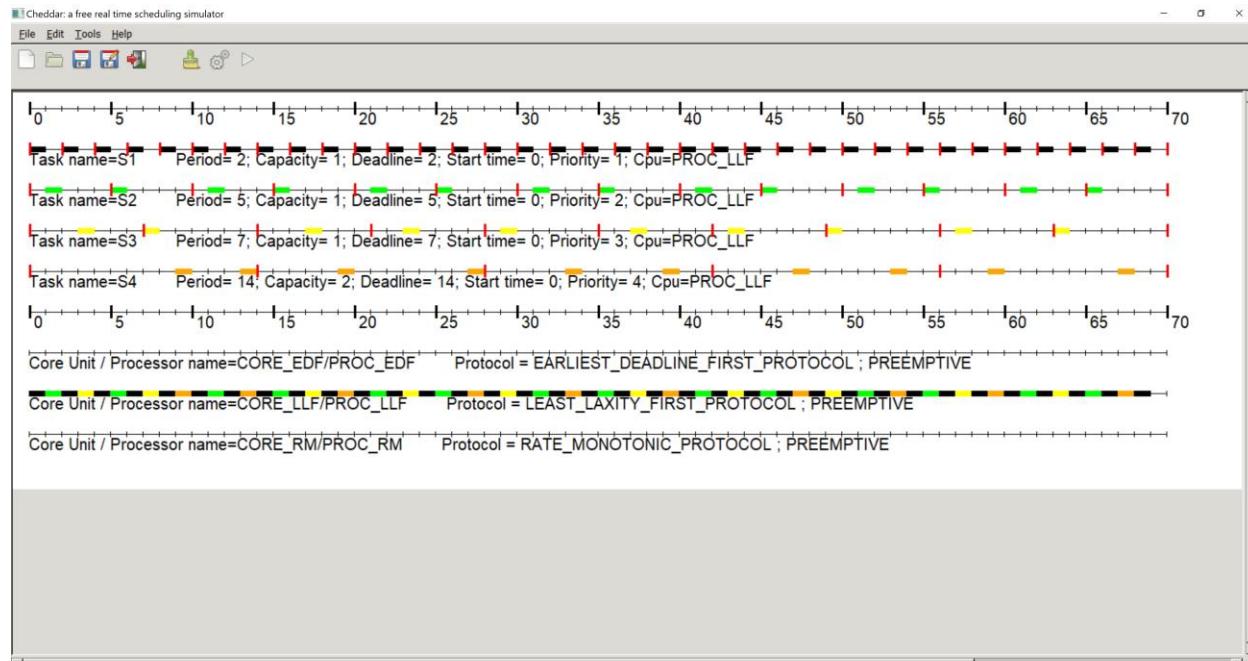
Scheduling simulation, Processor PROC_LLF :

- Define a task before
- Define a task before

Scheduling simulation, Processor PROC_RM :

- Define a task before
- Define a task before

Q9-LLF



Scheduling simulation, Processor PROC_EDF :

- Define a task before
- Define a task before

Scheduling simulation, Processor PROC_LLFB :

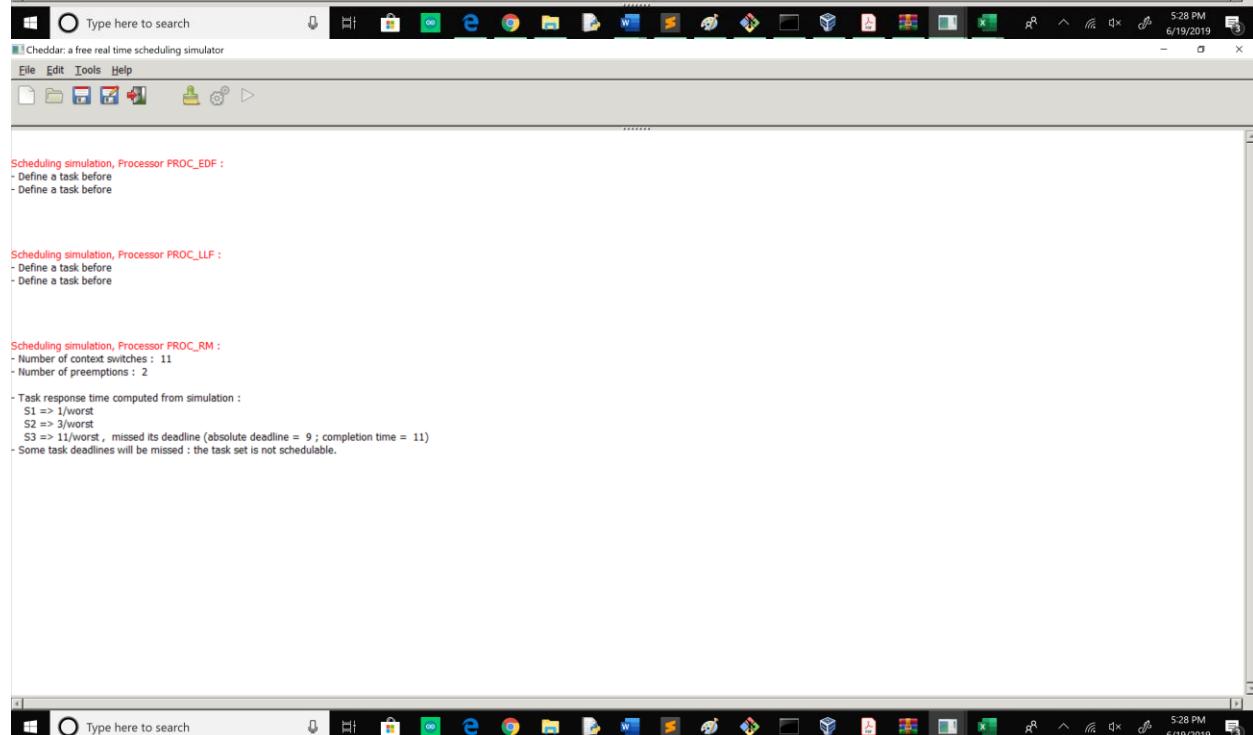
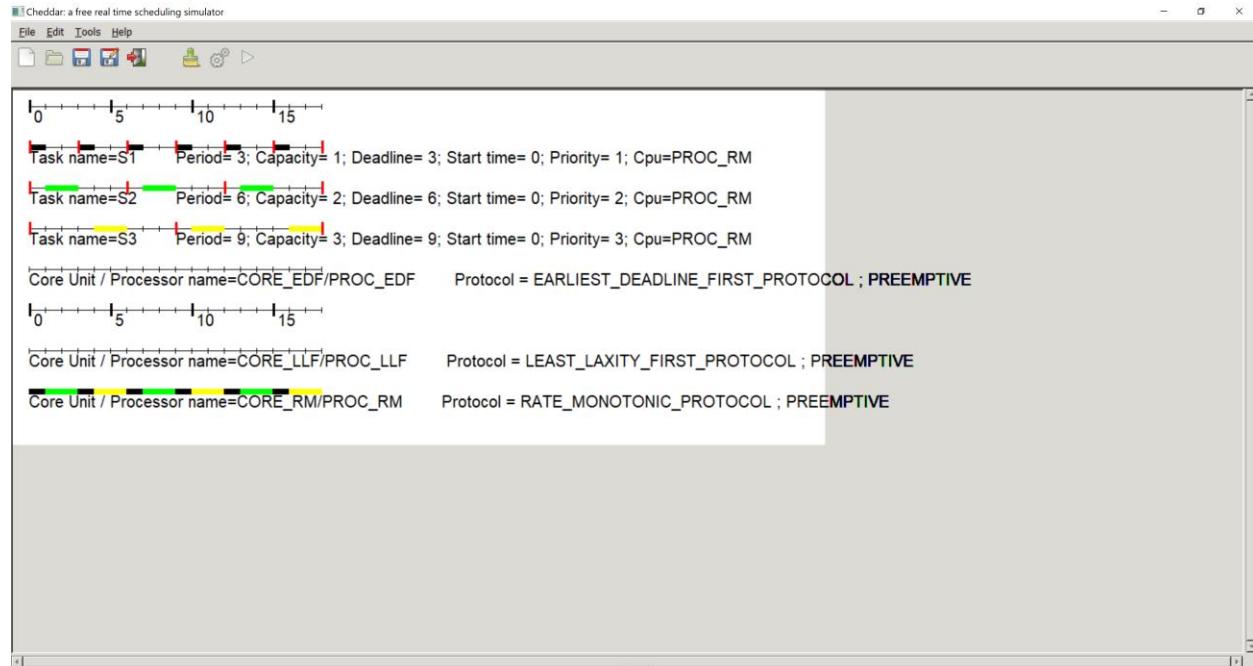
- Number of context switches : 68
- Number of preemptions : 5
- Task response time computed from simulation :
 - S1 => 1/worst
 - S2 => 2/worst
 - S3 => 4/worst
 - S4 => 14/worst
- No deadline missed in the computed scheduling : the task set is schedulable if you computed the scheduling on the feasibility interval.

Scheduling simulation, Processor PROC_RM :

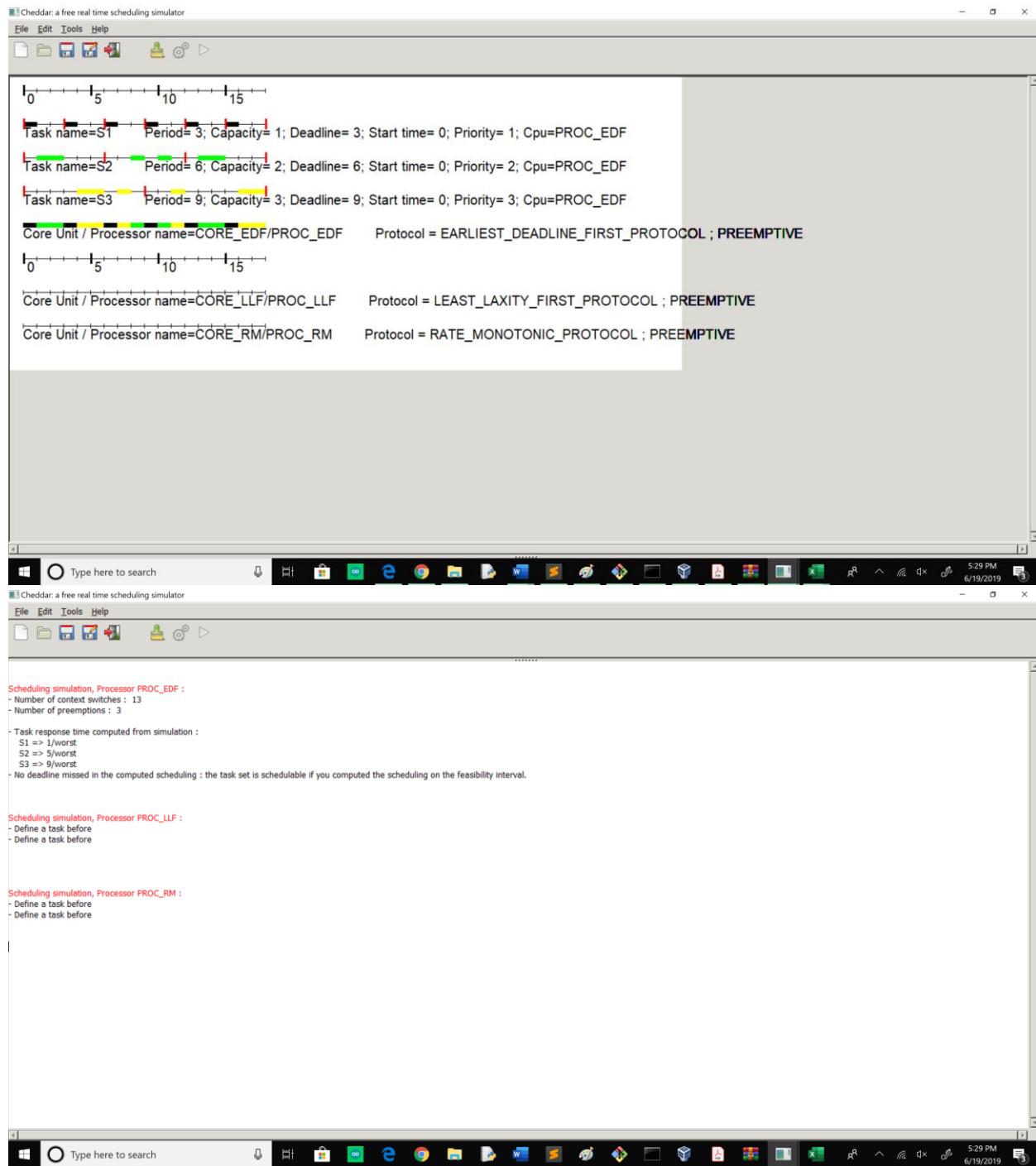
- Define a task before
- Define a task before



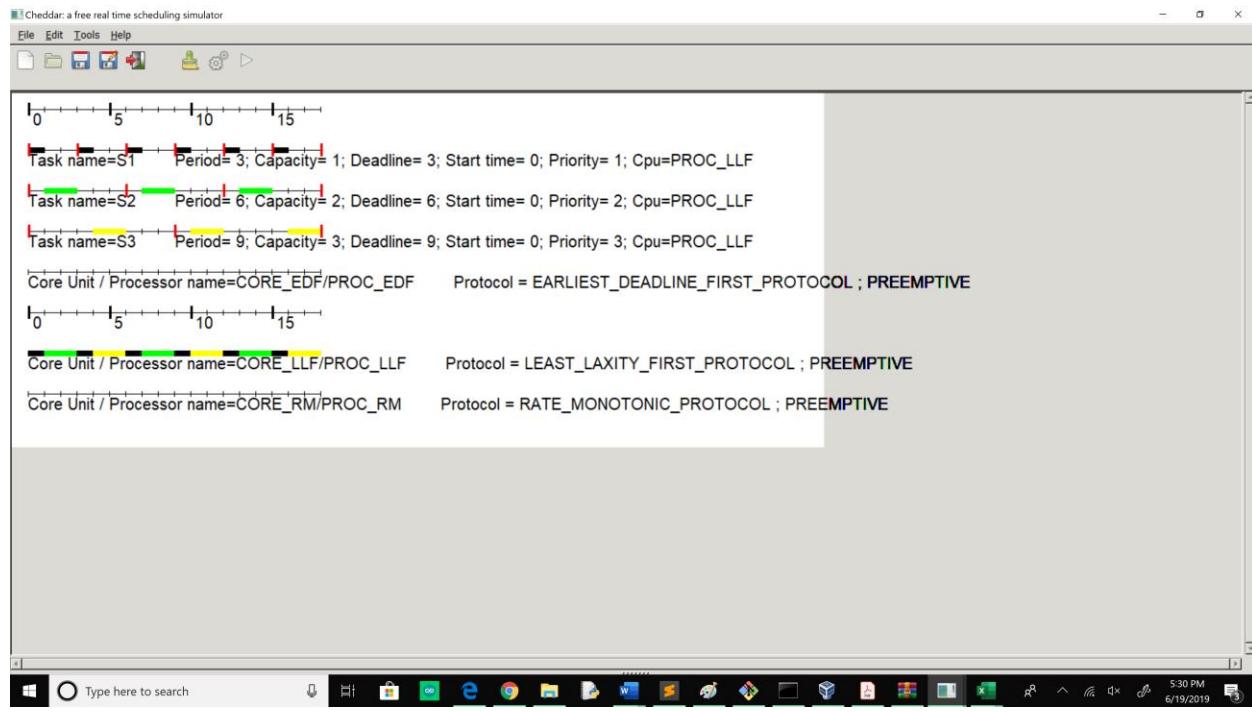
Q10-RM(EX-11)



Q10-EDF



Q10-LLF



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Scheduling simulation, Processor PROC_EDF :

- Define a task before
- Define a task before

Scheduling simulation, Processor PROC_LLFI :

- Number of context switches : 11
- Number of preemptions : 2
- Task response time computed from simulation :
 - S1 => 1/worst
 - S2 => 3/worst
 - S3 => 11/worst , missed its deadline (absolute deadline = 9 ; completion time = 11)
- Some task deadlines will be missed : the task set is not schedulable.

Scheduling simulation, Processor PROC_RM :

- Define a task before
- Define a task before

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