ENSEEIHT - 3SN-E-L
Second Labs on Real-Time Scheduling

Exercise 1

Let's assume the following task sharing resources R_1, R_2 and R_3:

	First release	WCET	D	P	Priority
T_1	6	3 : $\square$ R_1 $\square$	6	20	4
T_2	4	5 : $\square$ R_3 R_3 R_3 $\square$	11	20	3
T_3	2	5 : $\square$ R_2 R_2 R_2R_3 $\square$	15	20	2
T_4	0	5 : $\square$ R_1 R_1 R_1R_2 $\square$	18	20	1

1. Simulate this configuration without a specific protocol for resource allocation. What do you conclude?
2. Same question with the Priority Inheritance protocol.
3. Same question with the Stack-based Protocol (Immediate Ceiling Inheritance Protocol).

Exercice 2

Let's assume the following task sharing resources R_1, R_2, R_3 and R_4:

	First release	WCET	D	P	Priority
T_1	6	4 : $\square$ R_4 R_4R_3 $\square$	6	20	4
T_2	4	4 : $\square$ R_3 R_3R_4 $\square$	9	20	3
T_3	2	4 : $\square$ R_2 R_2R_1 $\square$	13	20	2
T_4	0	4 : $\square$ R_1 R_1R_2 $\square$	16	20	1

Is this configuration schedulable?

Exercice 3

1. Is the following task configuration schedulable on one processor with two cores using a fully global Rate Monotonic scheduler?

	First release	WCET	D	P
T_1	0	2	3	3
T_2	0	2	4	4
T_3	0	7	12	12

2. Same question with the following configuration

	First release	WCET	D	P
T_1	0	2	4	4
T_2	0	2	4	4
T_3	0	7	12	12

3. What do you conclude?

Exercice 4

Let's assume the following configuration of tasks.

	First release	WCET	D	P
T_1	0	1	2	2
T_2	0	2	3	3
T_3	0	2	4	4

Using fully global Rate Monotonic on one processor with two cores, does the worst-case for T_3 occurs for its first job (generated at 0)? What do you conclude?

Exercice 5

Let's assume the following configuration of tasks.

	WCET	D	P
T_1	2	6	6
T_2	4	8	8
T_3	3	10	10
T_4	12	20	20
T_5	1	50	50
T_6	20	50	50
T_7	5	100	100
T_8	1	100	100

1. Is it schedulable on three processors with a partitioned First-Fit Rate Monotonic scheduler?
2. Same question with a partitioned First-Fit Earliest Deadline First scheduler.