

SOFT400227: Operating System 2022-Fall

Homework-6 Solutions

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2022 年 10 月 20 日

Honor Code: I promise that I finished the homework solutions on my own without copying other people's work.

Deadlock

7.1

a.

- Mutual Exclusion: Only one car at a time can pass a crossing.
- Hold and wait: At least one car are waiting for another free crossing when it is passing one.
- NO Preemption: Only when the former car have passed the crossing, the latter car can pass the same one.
- Circular Wait: Cars which wait for the free crossing form a circle.

b.

Deal with the second condition: each car have to wait until all crossings it need to pass is free.

7.2

a. & b.

The system is safe as below.

	Allocation A B C D	Max A B C D	Need A B C D	Safety sequence	Available A B C D
P0	0 0 1 2	0 0 1 2	0 0 0 0	1	1 5 2 0
P1	1 0 0 0	1 7 5 0	0 7 5 0	3	2 8 8 6
P2	1 3 5 4	2 3 5 6	1 0 0 2	2	1 5 3 2
P3	0 6 3 2	0 6 5 2	0 0 2 0	5	3 8 9 10
P4	0 0 1 4	0 6 5 6	0 6 4 2	4	3 8 8 6

c.

Yes, because after new allocation the system is still safe as below.

	Allocation A B C D	Max A B C D	Need A B C D	Safety sequence	Available A B C D
P0	0 0 1 2	0 0 1 2	0 0 0 0	1	1 5 2 0
P1	1 0 0 0	1 7 5 0	0 7 5 0	3	2 8 8 6
P2	1 3 5 4	2 3 5 6	1 0 0 2	2	1 5 3 2
P3	0 6 3 2	0 6 5 2	0 0 2 0	5	3 8 9 10
P4	0 0 1 4	0 6 5 6	0 6 4 2	4	3 8 8 6

Other things

L^AT_EX code refer to these things and was compiled on texlive2020.

- [UCB-CS70's given homework template.](#)
- [A free website useful to edit L^AT_EX formula code.](#)
- [A free website helpful to generate L^AT_EX table.](#)

Some description refer to *Operating System Concepts 10th*, [Wikipedia](#) and Professor.Tian's PPT.

The purpose of writing in English is to adapt to bilingual teaching and to improve my poor English writing skills in preparation for a possible future exchange program.

Thanks for your correcting and grading :).