

Operating Systems – William Stallings – 7th Edition
Chapter 06 – Deadlock and Starvation

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REVIEW QUESTIONS

- 6.2 What are the three conditions that must be present for deadlock to be possible?
- 6.3 What are the four conditions that create deadlock?
- 6.4 How can the hold-and-wait condition be prevented?
- 6.5 List two ways in which the no-preemption condition can be prevented.

PROBLEMS

- 6.2 Show how each of the techniques of prevention, avoidance, and detection can be applied to Figure 6.1 .

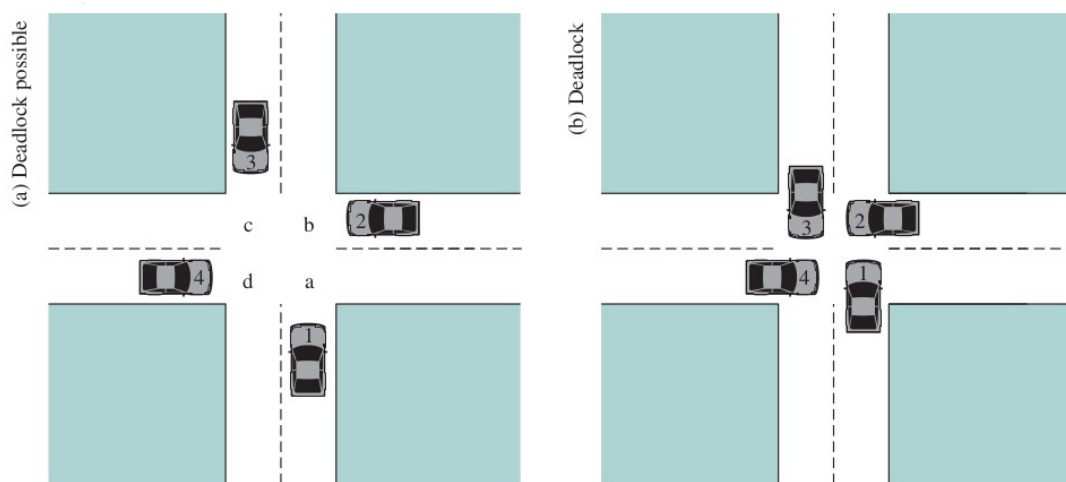


Figure 6.1 Illustration of Deadlock

- 6.5 Given the following state for the Banker's Algorithm. i) 6 processes P0 through P5; ii) 4 resource types: A (15 instances); B (6 instances); iii) C (9 instances); D (10 instances); iv) Snapshot at time T0:

Available			
A	B	C	D
6	3	5	4

	Current allocation			
	A	B	C	D
P0	2	0	2	1
P1	0	1	1	1
P2	4	1	0	2
P3	1	0	0	1
P4	1	1	0	0
P5	1	0	1	1

	Maximum demand			
	A	B	C	D
P0	9	5	5	5
P1	2	2	3	3
P2	7	5	4	4
P3	3	3	3	2
P4	5	2	2	1
P5	4	4	4	4

- a. Verify that the Available array has been calculated correctly.
- b. Calculate the Need matrix.
- c. Show that the current state is safe, that is, show a safe sequence of processes. In addition, to the sequence show how the Available (working array) changes as each process terminates.
- d. Given the request (3,2,3,3) from Process P5. Should this request be granted? Why or why not?