1. Consider the following snapshot of a system:

Allocation Max Available

ABCD ABCD ABCD

P₀ 0012 0012 1520

P₁ 1000 1750

P₂ 1354 2356

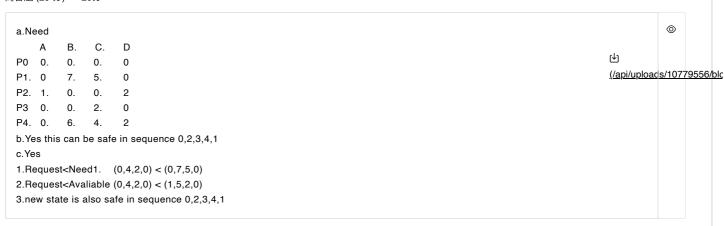
P₃ 0632 0652

P4 0014 0656

Answer the following questions using the banker's algorithm:

- a. What is the content ofthe matrix Need?
- b. Is the system in asafe state?
- c. If a request fromprocess P1 arrives for (0,4,2,0), can the request be granted immediately?

简答题 (20 分)



答案解释:

a. Need = Max - Allocation. Thus, its content is

Need

ABCD

P0 0 0 0 0

P10750

P2 1 0 0 2

P3 0 0 2 0

P40642

- b. Yes, the sequence < P_0 , P_2 , P_3 , P_4 , $P_1>$ satisfies the safety requirement.
- c. Yes. Since
- i. Request1 $(0,4,2,0) \le need1(0,7,5,0)$
- ii.Request1 $(0,4,2,0) \le available(1,5,2,0)$
- iii. The new system state after the allocation is madeis

Allocation Max Need Available

Po 0012 0012 0000 1100

 P_1 1420 1750 0330

 P_2 1354 2356 1002

P₃ 0632 0652 0020

P4 0014 0656 0642

and the sequence $< P_0, P_2, P_3, P_4, P_1 >$ satisfies the safety requirement.

2. A system is in a deadlock, if its resourceallocation graph ___

单选题 (8 分) 8分

A. has at least one outgoing edge from any oneof the process nodes

B. contains a cycle

D. doesn't contain a cycle
正确答案: C
3. Which of the following phenomena is not a kind of deadlock?单选题 (8 分) 8分
A. Two trains traveling toward each other inthe same track
B. A car cannot move forward because a bridge is damaged.
C. A person is going down a ladder while another is climbing up the ladder
D. Two cars crossing a single-lane bridge form opposite directions
正确答案: B
ENGLA. D
4. For operating systems, deadlock means 单选题 (8 分) 8分
A. A program is looping forever
B. system halts
C. hardware malfunctions
D. processes are blocked and wait for each other to finish
正确答案: D
5. Which of the following operating systemuses Banker's Algorithm to perform deadlock avoidance? 单选题 (8 分) 8分
A. Linux
B. Noneof the above
C. iOS
D. Windows 10
正确答案: B
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6. Which of the following is not a necessarycondition of deadlock?
单选题 (8 分) 8分
A. Mutual exclusion
B. Number of resources
C. Hold and wait
D. Circular wait
正确答案: B

C. contains a cycle and there is just oneinstance of every resource

request in order to avoiddeadlock?
单选题 (8 分) 8分
A. 4
B. 3
C. 1
D. 2
正确答案: B
8. There are N processes which share M mutualexclusive resources, each process can hold W resources at most. Which of thefollowing condition may cause a deadlock?
单选题 (8 分) 8分
A. M=4,N=2, W=3
B. M=2, N=1, W=2
C. M=4, N=3, W=2
D. M=2, N=2, W=1
正确答案: A
 The deadlock prevention is a set of methods for ensuring that at least one of the necessary conditions of deadlock can not be held. In the following methods, which one breaks the "Circular Wait" condition.
单选题 (8 分) 8分
A. Each process request resources in the ascending order of resource ID number.
B. none of the above
C. Each process request and be allocated allits resources before it begins execution
D. Banker's Algorithm
正确答案: A
10. Asystem has 3 concurrent processes, each of which requires 4 items of resourceR. What is the minimum number of resource R in order to avoid the deadlock.
单选题 (8 分) 8分
A. 10
B. 11
C. 12
D. 9

正确答案: A

7. Assumethat a system has 9 instances of 1 resource type shared by 4 processes. Howmany resource instances can a process be allowed to

11. Banker's algorithm is oneof algorithm。
单选题 (8 分) 8分
A. deadlock avoidance
B. deadlock prevention
C. deadlock recovery
D. deadlock detection
正确答案: A