CS3600 – Worksheet 04

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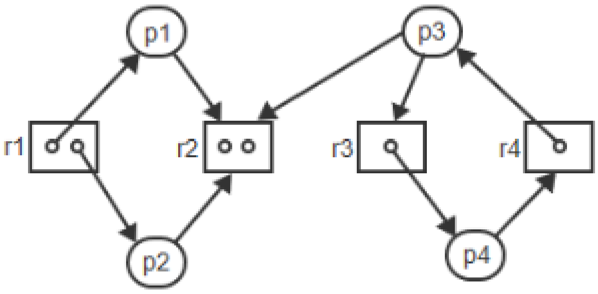
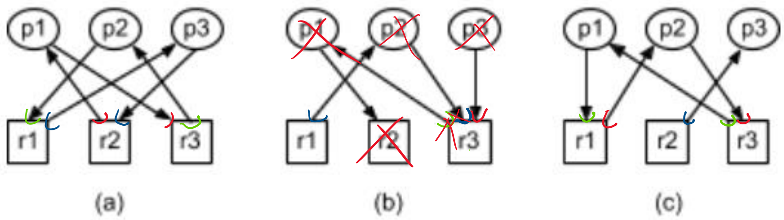
1. From the resource allocation graph, which processes are blocked and deadlocked?



p1, p2 & p3
all want the same resource (r2),
so 2 of them will be blocked
p3 & p4 are deadlocked because they are both
waiting on the other process to release resources
but they both hold a resource too.

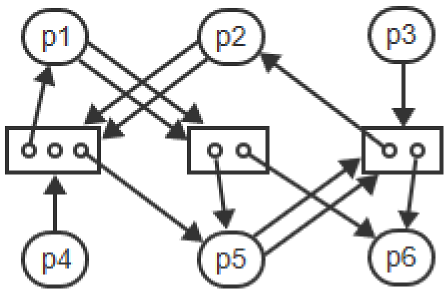
2. Given the resource allocation graph

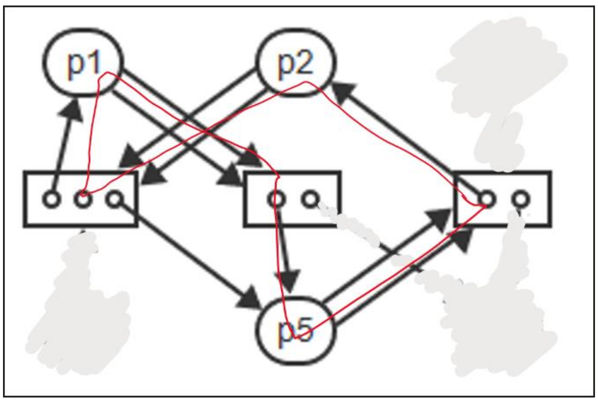


   a. Which process is not blocked in the graph (a)? NULL
   b. Which process is not blocked in the graph (b)? P1
   c. Which process is not blocked in the graph (c)? P3
   d. Which graph is completely reducible and thus not a deadlock state?

B

3. Using graph reduction, determine if the graph contains a deadlock. Which all process are removed?





Dead Locked

P3, P4 & P6
Are removed

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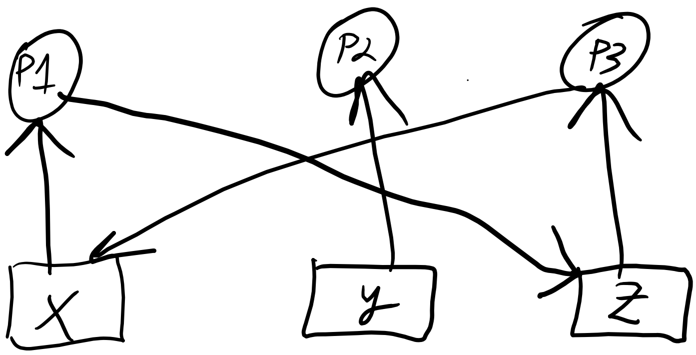
4. Processes p1, p2, and p3 are executing concurrently. The variables x, y, and z are binary semaphores, all initialized to 1. The arrow points to the currently executing instruction.

P1	P2	P3
… P(x) … P(z) <-- …	… P(y) … <--	… P(z) … P(x) <-- …

(a) To determine if the state is a deadlock state, draw a resource allocation graph by interpreting each semaphore as a resource containing 1 unit and each P operations as a request for the resource.



(b) Reduce the graph to determine if the state contains a deadlock.