

Quiz 5

1. What is the purpose of the “turnstile” synchronization tool in Solaris?
2. Identify whether the following statement is TRUE or FALSE. If the statement is FALSE, correct it and justify the corrected sentence. If the statement is TRUE, justify it. Restrict the justification to a few sentences: “Deadlock prevention protocols improve CPU utilization”.
3. Jurassic Park consists of a dinosaur museum and a park for safari riding. There are “m” passengers and “n” single-passenger cars. Passengers wander around the museum for a while, then line up to take a ride in a safari car. When a car is available, it loads the one passenger it can hold and rides around the park for a random amount of time. If the “n” cars are all out riding passengers around, then the passenger who wants to ride waits; if a car is ready to load but has no waiting passengers, then the car waits. Give a solution (Pseudo Code) with semaphores to synchronize the “m” passenger processes and the “n” car processes.
4. Assume a system with four resource types  $C = \langle 6, 4, 4, 2 \rangle$ ; the maximum claim table is below. The resource allocator is considering allocating resources according to the table shown below. Is this a safe state? Why and why not?

Maximum Claim table				
Process	R0	R1	R2	R3
P0	3	2	1	1
P1	1	2	0	2
P2	1	1	2	0
P3	3	2	1	0
P4	2	1	0	1
Current Allocation Table				
Process	R0	R1	R2	R3
P0	2	0	1	1
P1	1	1	0	0
P2	1	1	0	0
P3	1	0	1	0
P4	0	1	0	1

5. An old bridge on a busy highway is too narrow to allow two-way traffic, so one-way traffic should be implemented by alternatively allowing vehicles travelling in the opposite direction to use the bridge. The following rules are formulated for the use of bridge:
  - a. Any time the bridge is used by vehicle(s) travelling in one direction only.
  - b. If the vehicles are waiting to cross the bridge at both ends, only one vehicle from one end can cross the bridge before a vehicle from the other end starts crossing the bridge.
  - c. If no vehicles are waiting at one end, any vehicles from the other end can cross the bridge.
 Develop a synchronization solution (Pseudocode) with semaphores.