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Group MHA

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1) What is the meaning of the term busy waiting? Can busy waiting be avoided altogether? Explain your answer.

**Answer:**

2) Show that, if the wait() and signal() semaphore operations are not executed atomically, then mutual exclusion may be violate.

**Answer:**

3) Consider the following snapshot of a system, and answer the following questions using the banker’s algorithm:

Table

Description automatically generated with medium confidence

1. What is the content of the matrix Need?
2. Is the system in a safe state?
3. If a request from thread T1 arrives for (0, 4, 2, 0), can the request be granted immediately?

**Answer:**

4) Consider the following resource-allocation policy. Requests for and releases of resources are allowed at any time. If a request for resources cannot be satised because the resources are not available, then we check any threads that are blocked waiting for resources. If a blocked thread has the desired resources, then these resources are taken away from it and are given to the requesting thread. The vector of resources for which the blocked thread is waiting is increased to include the resources that were taken away.

For example, a system has three resource types, and the vector Available is initialized to (4, 2, 2). If thread T0 asks for (2, 2, 1), it gets them. If T1 asks for (1, 0, 1), it gets them. Then, if T0 asks for (0, 0, 1), it is blocked (resource not available). If T2 now asks for (2, 0, 0), it gets the available one (1, 0, 0), as well as one that was allocated to T0 (since T0 is blocked). T0 Allocation vector goes down to (1, 2, 1), and its Need vector goes up to (1, 0, 1).

1. Can deadlock occur? If you answer “yes”, give an example. If you answer “no”, specify which necessary condition cannot occur.
2. Can deadlock occur? If you answer "yes", give an example. If you answer "no", specify which necessary condition cannot occur.

**Answer:**

**SOURCES:**

(ABRAHAM SILBERSCHATZ, 2018)