Operating Systems Course	**Deadline**: May 18, 2008
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1. Disk controllers have internal buffers and they are getting larger with each new model. Why?
2. Each device driver has two different interfaces with the operating system. One interface is a set of function calls that the operating system makes on the driver. The other is a set of calls that the driver makes on the operating system. Name one likely call in each interface.
3. Why output files are normally spooled on disk before being printed?
4. Consider Fig. 3-10. Suppose that in step (o) C requested S instead of requesting R. Would this lead to deadlock? Suppose that it requested both S and R?
5. Take a careful look at Fig. 3-13(b). If D asks for one more unit, does this lead to a safe state or an unsafe one? What if the request came from C instead of D?
6. Suppose that process A in Fig. 3-15 requests the last tape drive. Does this action lead to a deadlock?
7. A computer has six tape drives, with n processes competing for them. Each process may need two drives. For which values of n is the system deadlock free?
8. Can a system be in a state that is neither deadlocked nor safe? If so, give an example. If not, prove that all states are either deadlocked or safe.
9. The banker's algorithm is being run in a system with m resource classes and n processes. In the limit of large m and n, the number of operations that must be performed to check a state for safety is proportional to $m^a n^b$. What are the values of a and b?
10. Consider the banker's algorithm of Fig. 3-15. Assume that processes A and D change their requests to an additional (1, 2, 1, 0) and (1, 2, 1, 0) respectively. Can these requests be met and the system still remain in a safe state?