Kevin Jiang

ECE357 Operating Systems

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Problem Set 6 Problem 1

Problem 1:

a) This is valid because there is only a single thread in a process. When all signals are blocked, other processes cannot take control during the critical region. There are no other threads of control besides the signal handlers, and because the signal handlers are blocked there will be no other threads accessing critical data structures.
b) In this case the code is not valid because there are still threads of execution other than the signal handlers. The other threads can still access critical data structures at the same time as the main thread running the code, and the signal masking does nothing to stop that.
c) In this case the code is not valid, same reasoning as (b). Even if each processor only had a single thread, the code could be running on multiple processors, and signal masks only disable signals for a single processor, so critical data structures could still be accessed at the same time within the critical region.
d) This case is similar to (a), since the only other threads other than the main thread are handlers for synchronous and asynchronous interrupts.
e) No valid, same reasoning as (c), the code could be running on multiple processors.