a) Problem set 9

09.01) **TODO**

09.02) **B. By the kernel writing the upmar register; E. By doyield saving and restoring upmar**

09.03) **C. In the procedure yield**

09.04) **A. Separate address spaces because wild writes from one application cannot modify the data of the other application; B. User-mode bit because it disallows user programs to write to upmar and kpmar**

09.05) **C. In the procedure main; D. In the procedure yield**

09.06) **A. Separate address spaces because wild writes from one application cannot modify the data of the other application; B. User-mode bit because it disallows user programs to write to upmar and kpmar; C. The timer chip because it, in conjunction with the kernel, forces threads to give up the processor**

09.07) **B. Some even number other than a power of two.**

09.08) **C. Some power of two**

09.09) **A. Yes, because while the first thread is in the region, an interrupt may cause the processor to switch to the second thread and the second thread might enter the region.**

09.10) **A. a = 2 and b = 1**

b) Problem set 10

10.01) **A. Virtual addresses**

10.02) **A. The return address for the next return instruction**

10.03) **B. print\_msg**

10.04) **A. Memory-mapped I/O**

10.05) **A. 34. continue; thread 1 will be running**

10.06) **A. Addresses of any instruction**

10.07) **A. state[current\_thread] = waiting**

10.08) **A. Thread 0 calls yield; B. The interrupt procedure for input device 1 calls notify**

10.09) **A. Addresses of any instruction except those in the device driver interrupt procedure**

10.10) **TODO**

c) Exercise 6.4

Mike R. Kernel is designing the OutTel P97 computer system, which currently has one page table in hardware. The first tests with this design show excellent performance with one application, but with multiple applications, performance is awful. Suggest three design changes to Mike’s system that would improve performance with multiple applications, and explain your choices briefly. You cannot change processor speed, but any other aspect of the system is fair game.

**TODO**