

## Computer Systems problems — Part 2

1. Why is the distinction between user mode and kernel mode considered good operating system design? Give an example that illustrates a user process being switched from user mode to kernel mode, and then back to kernel mode.
2. What are the main differences between a trap and an interrupt? Give an example where, after servicing an interrupt, control is returned to a different process than the one running before the interrupt.
3. Which of the following instructions should be allowed only in kernel mode?
  - (a) Disable all interrupts. (Why would this happen?)
  - (b) Read the time-of-the-day clock.
  - (c) Set the time-of-the-day clock.
  - (d) Change the memory image of a process.
4. An I/O-bound program is one that, if run alone, would spend more time waiting for I/O than using the processor. A processor-bound program is the opposite. Suppose a short-term scheduling algorithm favours those programs that have used little processor time in the recent past. Explain why this algorithm favours I/O-bound programs and yet does not permanently deny processor time to processor-bound programs.