

Operating Systems

Introduction and Operating System Architectures

Question Sheet Week 1

Please go through these questions in your own time with the help of the textbooks. Write down the answers and bring them to the lab class to discuss any queries you may have with your fellow students and your lab tutor.

1. What are the main functions of an operating system?
2. What is multiprogramming? What is the reason for using multiprogramming?
3. What is the difference between multitasking and multiprogramming?
4. Graphical user interfaces were invented in the 1960s. However, they were initially slow to be adopted because of the cost of the hardware needed to support them. How much video RAM is needed to support a 25-line 80-row character monochrome text screen? How much for a 1200 900-pixel 24-bit color bitmap? What was the cost of this RAM at 1980 prices (\$5/KB)? How much is it now?
5. What are interrupts, exceptions, faults, aborts, and traps? Which properties distinguish them?
6. What is the kernel of an operating system?
7. Which of the following instructions should be allowed only in kernel mode?
 - (a) Disable all interrupts.
 - (b) Read an internal clock/timer.
 - (c) Modify an internal clock/timer.
 - (d) Load an address into the PC.
 - (e) Change the memory map.
8. What is a system call? For which purpose may user programs use it?
9. To a programmer, a system call looks like any other call to a library procedure. Is it important that a programmer know which library procedures result in system calls? Under what circumstances and why?
10. A portable operating system is one that can be ported from one system architecture to another without any modification. Explain why it is infeasible to build an operating system that is completely portable.
11. Explain the importance of the concepts of orthogonality and encapsulation. How are they used in structuring an operating system?
12. Explain how separation of policy and mechanism aids in building microkernel-based operating systems.
13. What is Moore's Law? How does it compare to the growth of populations of animal species? Discuss factors that may eventually change how computer systems improve.