Introduction

Practice Exercises

1.1 What are the three main purposes of an operating system?

1.2 What are the main differences between operating systems for mainframe computers and personal computers?

1.3 List the four steps that are necessary to run a program on a completely dedicated machine.

1.4 We have stressed the need for an operating system to make efficient use of the computing hardware. When is it appropriate for the operating system to forsake this principle and to "waste" resources? Why is such a system not really wasteful?

1.5 What is the main difficulty that a programmer must overcome in writing an operating system for a real-time environment?

1.6 Consider the various definitions of *operating system*. Consider whether the operating system should include applications such as Web browsers and mail programs. Argue both that it should and that it should not, and support your answer.

1.7 How does the distinction between kernel mode and user mode function as a rudimentary form of protection (security) system?

1.8 Which of the following instructions should be privileged?

    a. Set value of timer.

    b. Read the clock.

    c. Clear memory.

    d. Issue a trap instruction.

    e. Turn off interrupts.

    f. Modify entries in device-status table.

g. Switch from user to kernel mode.

h. Access I/O device.

1.9 Some early computers protected the operating system by placing it in a memory partition that could not be modified by either the user job or the operating system itself. Describe two difficulties that you think could arise with such a scheme.

1.10 Some CPUs provide for more than two modes of operation. What are two possible uses of these multiple modes?

1.11 Timers could be used to compute the current time. Provide a short description of how this could be accomplished.

1.12 Is the Internet a LAN or a WAN?