

作业 1 (第二章)

【提示：(1) 鼓励相互讨论，但严禁抄袭他人作业和 COPY 习题答案！违者以 0

分论处！(2) 本周日 (3 月 19 日) 21: 00 前，在课程 QQ 群作业系统里提交！】

1、复习教材第二章，并简答如下问题【自己理解并解答，不用提交！】

- 2.1 What are three objectives of an OS design?
- 2.2 What is the kernel of an OS?
- 2.3 What is multiprogramming?
- 2.4 What is a process?
- 2.5 How is the execution context of a process used by the OS?
- 2.6 List and briefly explain five storage management responsibilities of a typical OS.
- 2.7 Explain the distinction between a real address and a virtual address.
- 2.8 Describe the round-robin scheduling technique.
- 2.9 Explain the difference between a monolithic kernel and a microkernel.
- 2.10 What is multithreading?

2、综合题【请解答并提交！】

- 2.1 Suppose that we have a multiprogrammed computer in which each job has identical characteristics. In one computation period, T , for a job, half the time is spent in I/O and the other half in processor activity. Each job runs for a total of N periods. Assume that a simple round-robin scheduling is used, and that I/O operations can overlap with processor operation. Define the following quantities:
 - Turnaround time = actual time to complete a job
 - Throughput = average number of jobs completed per time period T
 - Processor utilization = percentage of time that the processor is active (not waiting)Compute these quantities for one, two, and four simultaneous jobs, assuming that the period T is distributed in each of the following ways:
 - a. I/O first half, processor second half
 - b. I/O first and fourth quarters, processor second and third quarter
- 2.2 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 favors those programs that have used little processor time in the recent past. Explain why this algorithm favors I/O-bound programs and yet does not permanently deny processor time to processor-bound programs.
- 2.3 Contrast the scheduling policies you might use when trying to optimize a time-sharing system with those you would use to optimize a multiprogrammed batch system.
- 2.4 What is the purpose of system calls, and how do system calls relate to the OS and to the concept of dual-mode (kernel mode and user mode) operation?