FEW, Dept. of Computer Science
Vrije Universiteit

Operating Systems
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Voor Nederlands, z.o.z.

All questions count equally. Final grade = max(midterm, PART 1) + Part 2

PART 1

1. Write a minimal shell in C. Make sure all the essential statements are present.

2. MINIX has a background process, *update*, that usually sleeps but wakes up briefly every 30 seconds. What does it do and what could happen without it?

3. Threads can be managed by a user-space library or by the kernel. Give one advantage and one disadvantage of each technique.

4. A real-time system in which something happens every *n* milliseconds is called a periodic real-time system. Under certain circumstances, such a system is schedulable. Explain what this means and give an example of a system that is ***not*** schedulable.

5. Formerly, some operating systems used the primitives SLEEP and WAKEUP for synchronization. Was that a good choice? Explain your answer.

PART 2

6. All MINIX device drivers have approximately the same main program. Give the code in C for this main program.

7. Name three functions of the MINIX clock driver.

8. Explain how an inverted page table works. Under what circumstances is this type of page table the preferred one?

9. Every computer with virtual memory must have a strategy for choosing physical memory pages when needed (on a page fault). In this context, explain the difference between a local strategy and a global strategy.

10. In Windows NT, very small files can be stored in the Windows equivalent of the the I-node. What is the value of this choice?