

DAT 103

Datamaskiner og operativsystemer (Computers and Operating Systems)

Supplementary exercises (Set 2)

Some questions about operating systems

Problem 1

What are the three main purposes of an operating system?

Problem 2

Which one of the following is **not** an activity of an operating system?

- (a) To control I/O devices and user programs
- (b) To allocate resources to various programs
- (c) To provide mechanisms for process synchronisation
- (d) To load the BIOS to boot a computer
- (e) None of the above

Problem 3 (Ex 1.1 in [B1])

In a multiprogramming and time-sharing environment, several users share the system simultaneously. This situation can result in various security problems. What are two such problems?

Problem 4 (Ex. 1.4 in [B1])

1. Describe the differences between *symmetric* and *asymmetric* multiprocessing.
2. What are the advantage and disadvantages of multiprocessor systems?

Problem 5

Which one of the following can characterise *symmetric multiprocessing*?

- (a) Each processor is assigned with a specific task
- (b) All processors are peers
- (c) It always uses uniform memory access (UMA) model
- (d) All of the above
- (e) None of the above

Problem 6 (Ex 1.5 in [B1])

How do clustered systems differ from multiprocessor systems? What is required for two machines belonging to a cluster to cooperate to provide a highly available service?

Problem 7

Which **one** of the following is mainly stored in read-only memory (ROM) chips?

- (a) System files
- (b) Root directories
- (c) Firmware
- (d) All of the above
- (e) None of the above

Problem 8 (Ex. 1.13 in [B1])

Discuss, with examples, how the problem of maintaining coherence of cached data manifests itself in the following processing environments.

1. Single-processor systems
2. Multiprocessor systems
3. Distributed systems

Problem 9

What is the purpose of system calls?

Problem 10 (Ex. 2.10 in [B1])

1. How do user programs and system services interact in a microkernel architecture?
2. What are the main advantages and disadvantages of the microkernel approach to system design?