Operating Systems 2016/17
Tutorial-Assignment 6

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Question 6.1: Interprocess Communication (IPC)

a. How can concurrent activities interact in a (local) system?

b. Why does it make sense to define a timeout for IPC operations?

c. Asynchronous `send` operations require a buffer for sent but not yet received messages. Discuss possible locations for this message buffer and evaluate them.

d. Consider a system that uses synchronous message passing and timeouts to detect/recover from non-responding communication partners. Discuss why the system designers might choose to provide an atomic `send-and-receive` system call in addition to separate `send` and `receive` calls.

Question 6.2: Emulation using IPC

a. How can you perform asynchronous interprocess communication if your operating system only provides synchronous IPC mechanisms?

b. How can you provide synchronous IPC if your operating system only offers asynchronous IPC mechanisms?

Question 6.3: Pipes

a. Write a C-program for Linux that creates two child processes, `ls` and `less` and uses an ordinary pipe to redirect the standard output of `ls` to the standard input of `less`.