

Modelling of Distributed Systems - Tutorial 4

20th June 2018

Exercise 1 Specification and realization of stream processing functions

- (a) Model a component that combines two input streams of natural numbers and outputs the merged stream. Is there another variant of this implementation?
- (b) Apply the above component to the input streams - $\langle 5, 2, 10 \rangle$ and $\langle 3, 100 \rangle$
- (c) Model a component that takes as input two sorted streams of natural numbers, and as an output gives a merged sorted stream.
- (d) Apply the above component to the input streams - $\langle 1, 5, 10 \rangle$ and $\langle 2, 4, 25 \rangle$

Exercise 2 Composition of stream processing functions

- (a) Model an identity function, id , duplicating its input as output, and an adder function, add , with two identical outputs.
- (b) (*Homework*) Consider the composition of id and add , as shown in Fig. 1.
What is the output for this composition in case of input streams - $\langle 1, 1, 1, 1, 1 \rangle$?

Exercise 3 Process algebra

- (a) Define a *process term* for a process that continuously receives a (uninterrupted) signal and resends in turn, until stopped by a dedicated *Halt* signal. What is its alphabet?
- (b) (*Homework*) Turn the above process into an unreliable medium. (Non-deterministic)

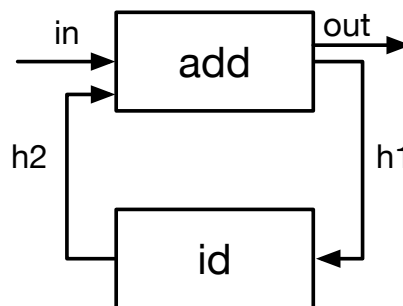


Abbildung 1: Composition of add and id components