

# Exercise 5: SystemC and Virtual Prototyping

## Exercise on sc\_fifo

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The source code to start this exercise is available here:  
<https://github.com/TUK-SCVP/SCVP.Exercise5>

### Task 1

#### Kahn Process Networks

Figure 1 shows an example for a *Kahn Process Network* (KPN). It consists of three processes and has no inputs and one output  $e$ . The process **Add** reads one integer number from each input  $a$  and  $c$  and writes the sum of both numbers to its output ( $b = a + c$ ). The **Split** process copies its input to two FIFOs ( $a$  and  $d$ ) and to the output signal  $e$ . The process **Delay** writes its input  $d$  to its output  $c$ . Two FIFOs are initialized with single values:  $b = 1$  and  $c = 0$ .

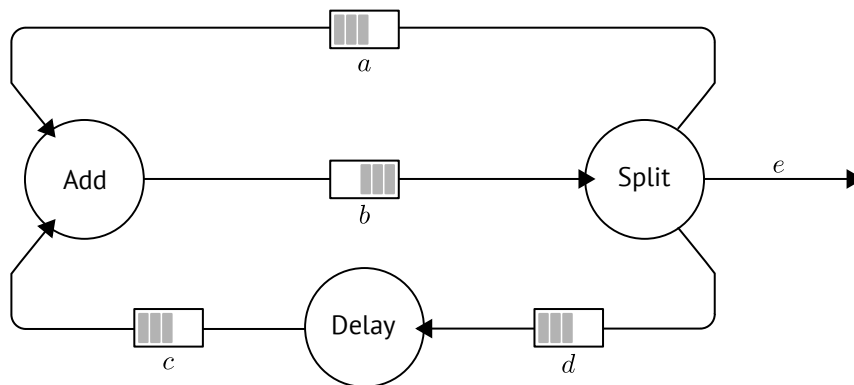


Fig. 1: Simple Kahn Process Network

The task for this exercise is to implement this KPN in SystemC using `sc_fifo<T>` and `SC_THREADS` for the processes. Please use a fifo size of 10, unsigned int as template type `T` and blocking `read()` and `write()` for accessing the FIFOs. The output  $e$  should be printed by the **Split** process. The **Split** process should stop the simulation after 10 prints. Initialize the FIFOs  $b$  and  $c$  in the `SC_CTOR`.

What is this KPN doing?