Exercise 5: SystemC and Virtual Prototyping

Exercise on `sc_fifo`

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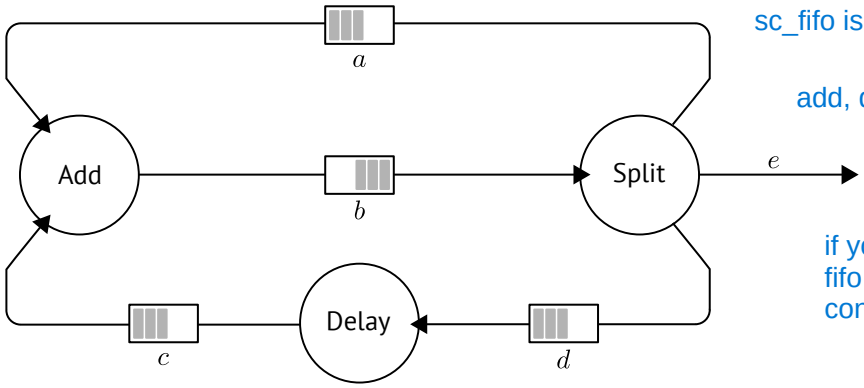
The source code to start this execise is available here:
`https://github.com/TUK-SCVP/SCVP.Exercise5`

Task 1

Petri Nets are non-deterministic while KPNs are deterministic

Kahn Process Networks

Figure 1 shows an example for a *Kahn Process Network* (KPN). It consits of three processes, has zero inputs and one output e. The process **Add** reads one integer number from each of its input a and c and writes the sum of both numbers to its output b ($b = a + c$). The **Split** process copies its input b 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 $c = 0$.



sc_fifo is a channel

add, delay, split are modules

if you isolate each fifo, each fifo has a producer and a consumer

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 depth 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?