Lab session #07

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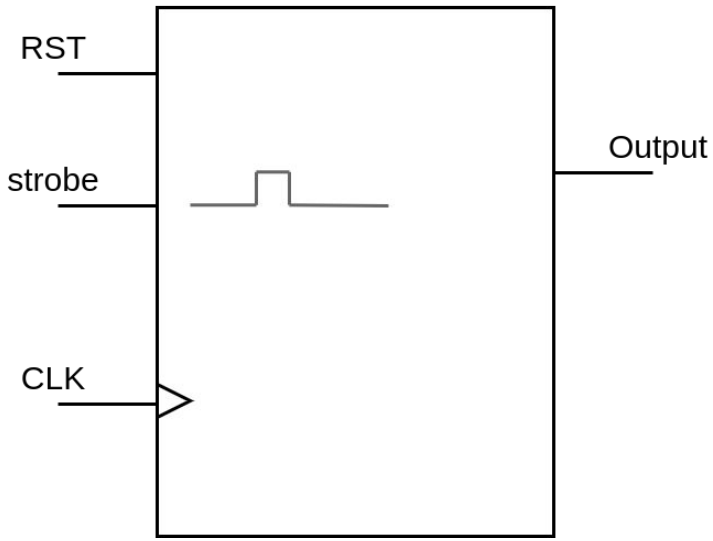
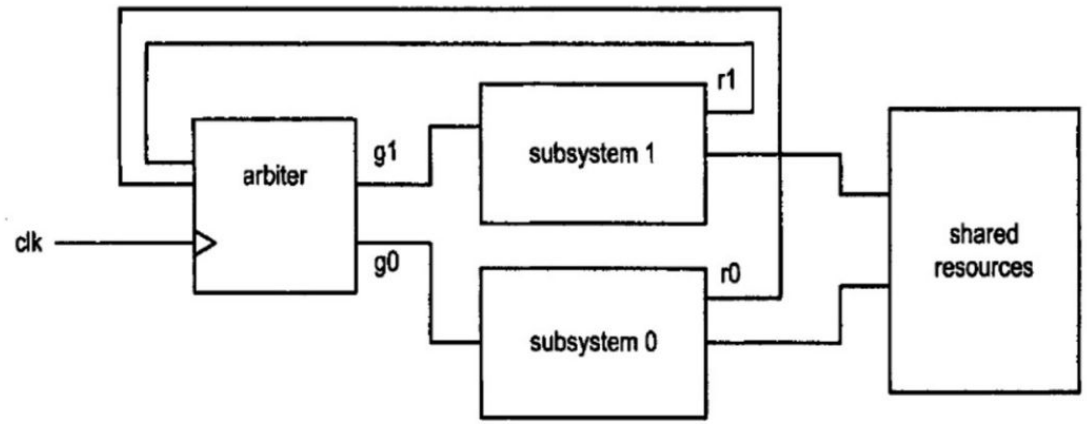
FSM-based Edge detection circuit



- Design a synchronous edge detection circuit by using a FSM approach with asynchronous reset:
  - The circuit receives at its input a signal called strobe and detects its rising edges.
  - Whenever a strobe is detected, the output of the circuit should assert.
  - Implement the circuit using both Moore and Mealy FSMs.
- On your testbench make sure to cover the relevant cases. Run a simulation with both designs in order to see how the two types of approach differ in practical terms.

FSM-based 2-request arbiter



- Design a Moore FSM-based arbiter circuit that handles multiple access requests (two in this case) towards a common shared resource (e.g. a memory).
- The arbiter makes sure that the access to the resource happens in the correct way, following a precise decision. When only one subsystem tries to access, the arbiter grants that request, while if multiple requests are issued it decides the correct order.
- Implement the arbiter such that the order of resource accesses is established following two guidelines:
  - Fixed priority to a given subsystem;
  - Last subsystem that accessed the resource has least priority.
- Write a testbench to test the architecture in relevant cases.