Suppose you are asked to create a FSM that can detect a sequence that meets the following qualifications:

* The machine is looking for a sequence of 5 consecutive bits
* The sequence should involve exactly one “flip” at the binary level
  + A “flip” in the sequence involves switching from 0 to 1 OR from 1 to 0. I  
    intentionally do not list examples so that not everyone does the exact same sequence, but feel free to check with me if you are not sure.

For either a Mealy OR a Moore machine, create a diagram for the FSM that could detect  
your chosen sequence, then implement the design in Hardcaml.

It is recommended that you begin from the provided example SequenceDetectorFSM, which is implemented as a Moore machine specifically.

The output of your FSM should modify the direction of the counter (so for example, when your output becomes 1, your counter switches from counting up to counting down or vice versa).

* We cannot just directly use the FSM output for this! We only want to flip the direction when we get to the very end of our FSM, so if we base the flipping directly off of our FSM output value, we will get undesired behavior.

Choose one of the bits of the counter (make sure to think through and choose a particular bit that changes somewhat frequently but not nearly instantaneously!) as the "input" to your FSM.

* Other specifics of this intentionally left open-ended to allow for different approaches, but ask questions if you are unsure about these instructions or anything left unsaid!