Mealy machines (6.3)

A Mealy machine is one where the outputs depend directly on the inputs. That has significantly more implications than you'd think.

- First of all, it means that the outputs will change soon after the inputs change and won't wait for the next rising edge of the clock. This can be handy (fast response time) and annoying (recall our traffic light from lab—you really don't want the light changing from green to yellow to green again).
- Secondly it means that we can sometimes reduce the number of states needed.
- It also means that the outputs need to show up on edges (arcs) of the state diagram rather than in the states. (Why is that?)

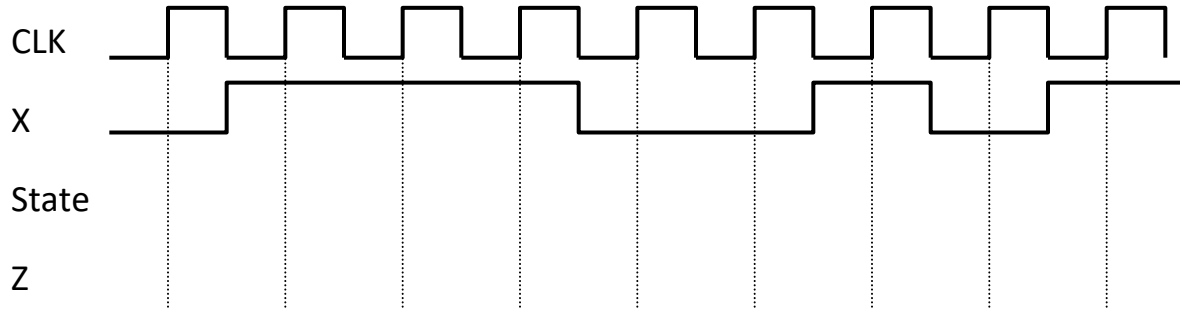
Draw the high-level diagram for a Moore machine (next state, state, OL). What what gets added for a Mealy machine?

Problem:
Using a Moore machine which takes one input X and generates one output Z, design it so that Z goes high iff X has been high for the last two cycles.

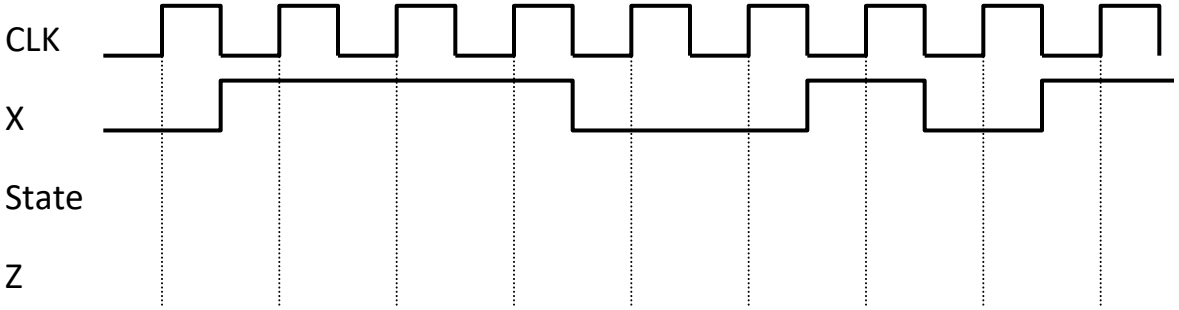
Now solve the same problem with a Mealy machine.

Now, let's look at the timing diagram associated with each machine.

Moore:



Mealy:



Let's discuss some implications of Mealy Machines:

- How to "fix" the above issues (or at least differences) with the Moore Machine output.
- Lab 6 and how it could change.
- How the Verilog would change.