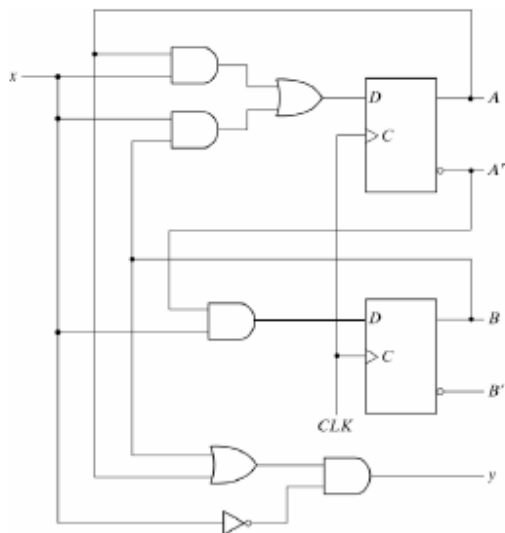# MEALY AND MOORE MODELS

The most general model of a sequential circuit has inputs, outputs and internal states. It is common to distinguish between two models of sequential circuits:

- **Mealy model** – The output is a function of both the present state and input.
- **Moore model** – The output is a function of the present state only.

   An example of a Mealy model is:

An example of a Moore model is:
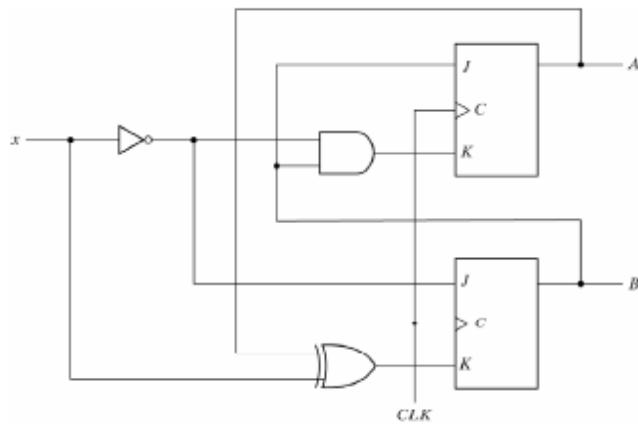
In a Moore model, the outputs of the sequential circuit are synchronized with the clock because they depend on only flip-flop outputs that are synchronized with the clock In a Mealy model, the outputs may change if the inputs change during the clock cycle. To achieve synchronization, the inputs must be synchronized with the clock and the outputs must be sampled only during the clock edge.

Mealy Circuits	Moore Circuits
(1.) Current outputs are affected by the *current state and the current inputs*	**(1.)** Current outputs are affected by the *current state only*
(2.) Outputs are *unstable* until current inputs achieve steady state	**(2.)** Current outputs are *always stable* since they depend only on the current state which is always stable
(3.) *More difficult* to engineer because of the unstable outputs	**(3.)** *Easy* to engineer since current outputs are always stable
(4.) Require *less* hardware than Moore circuits	**(4.)** Require *more* hardware than Mealy circuits
(5.) Inputs can effect outputs in *current clock period*	**(5.)** Inputs can affect outputs in *next clock period only*