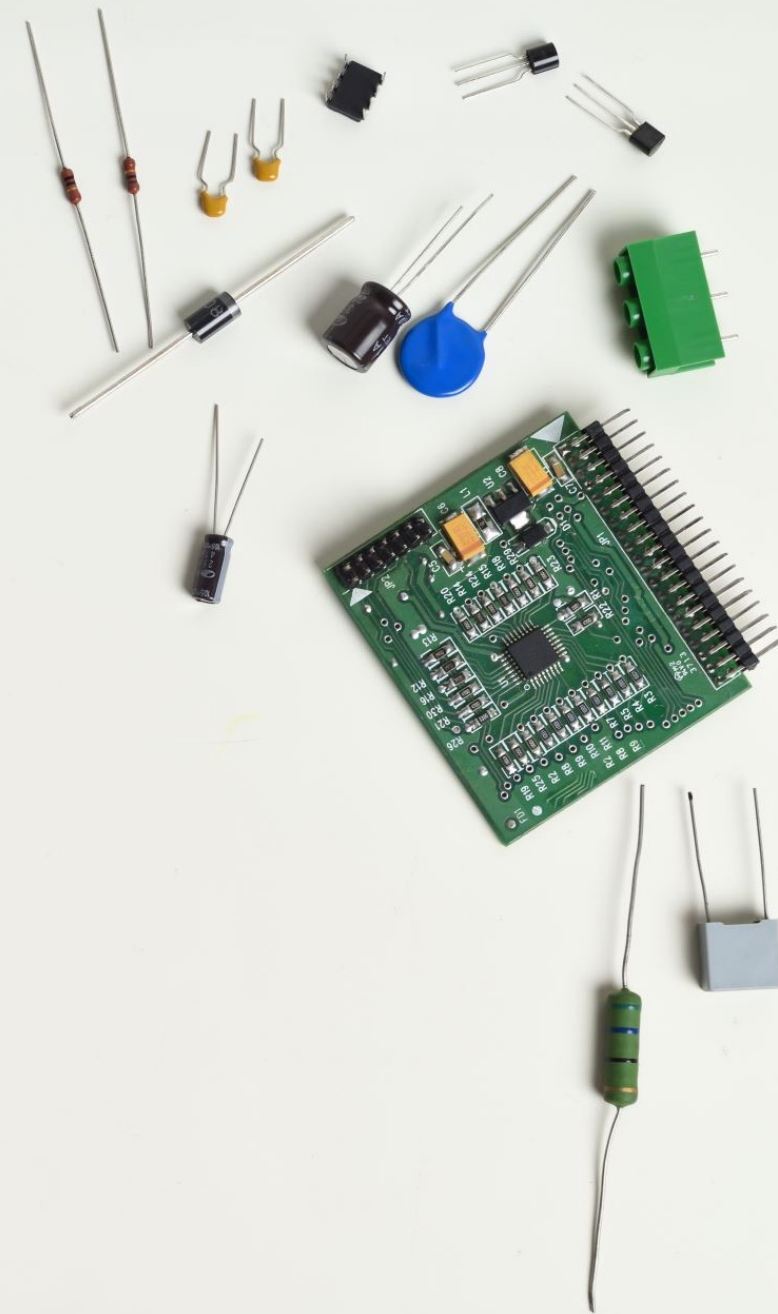


Lecture 08 - Analysis of Sequential Circuits

ECE09: Digital Electronics 1
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Terms in Sequential Circuits

Characteristic Table

- A characteristic table defines the logical properties of a flip-flop by describing its operation in tabular form.

State Table

- The time sequence of inputs, outputs, and flip-flop states can be enumerated in a state table (sometimes called transition table).

Characteristic Equation

- Algebraic representation of the logical properties of a flip-flop.

State Equation

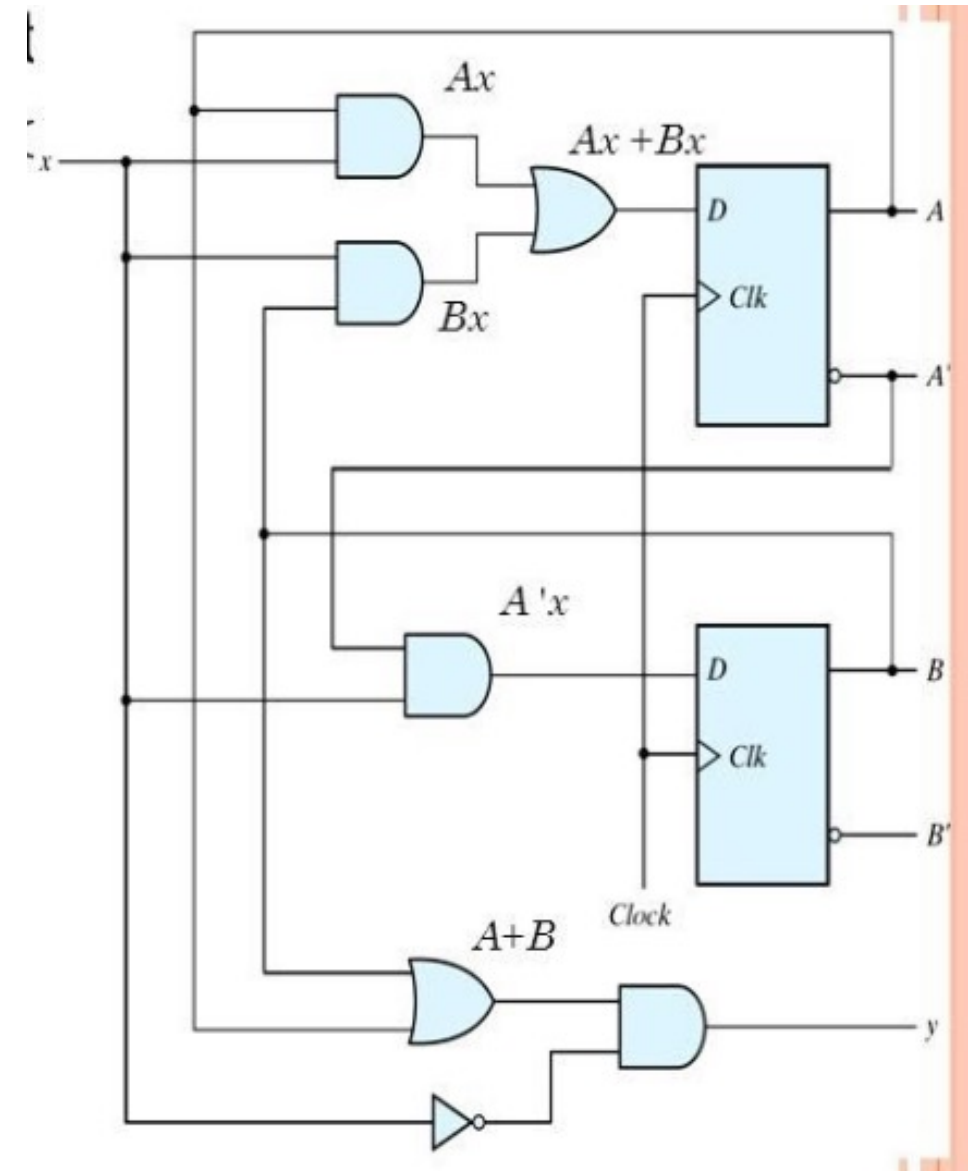
- Algebraic representation of the behavior of a sequential circuit.
- Specifies the next state as a function of present state and inputs.

State Diagram

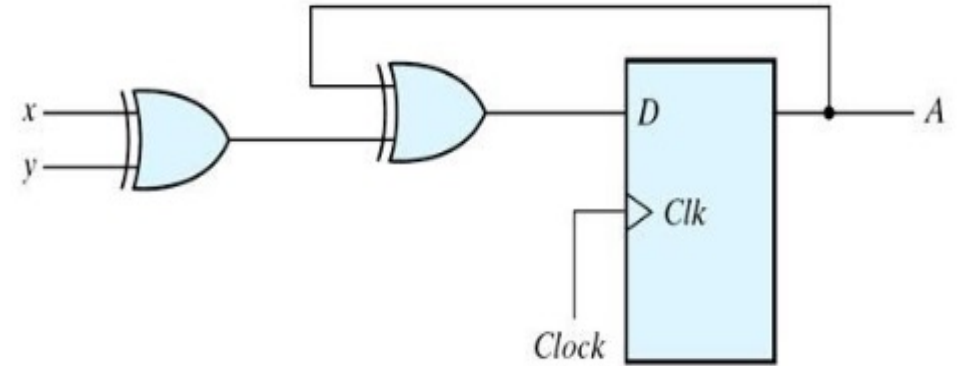
- Graphical representation of the information available in a state table.

Flip-Flop Input Equations (Excitation Equation)

- It describes algebraically the part of a circuit that generates the inputs to flip-flops



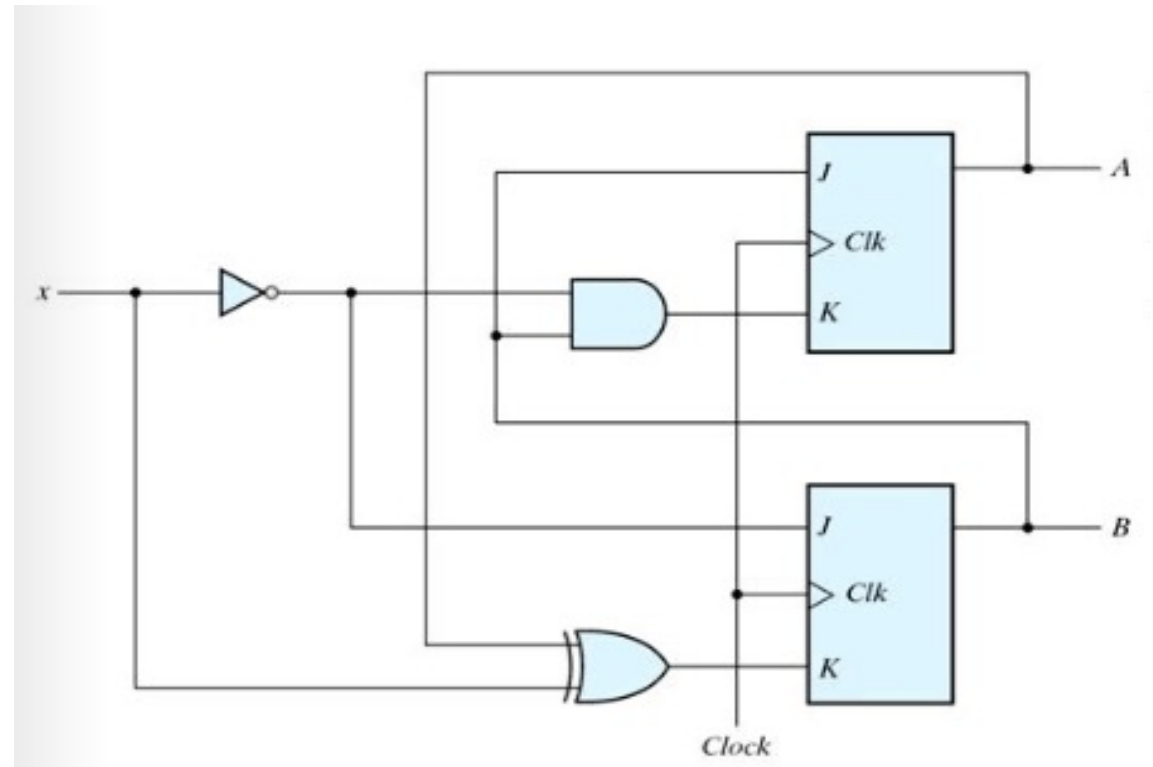
Analysis with D Flip-flops



Analysis with JK Flip-flops

Characteristic Equation: $Q(t+1) = JQ' + K'Q$

JK Flip-Flop			
J	K	$Q(t+1)$	Operation
0	0	$Q(t)$	No change
0	1	0	Reset
1	0	1	Set
1	1	$Q'(t)$	Complement



Analysis with T Flip-flops

T Flip-Flop		
T	$Q(t+1)$	Operation
0	$Q(t)$	No change
1	$Q'(t)$	complement

Characteristic Equation: $Q(t+1) = T'Q + TQ'$

