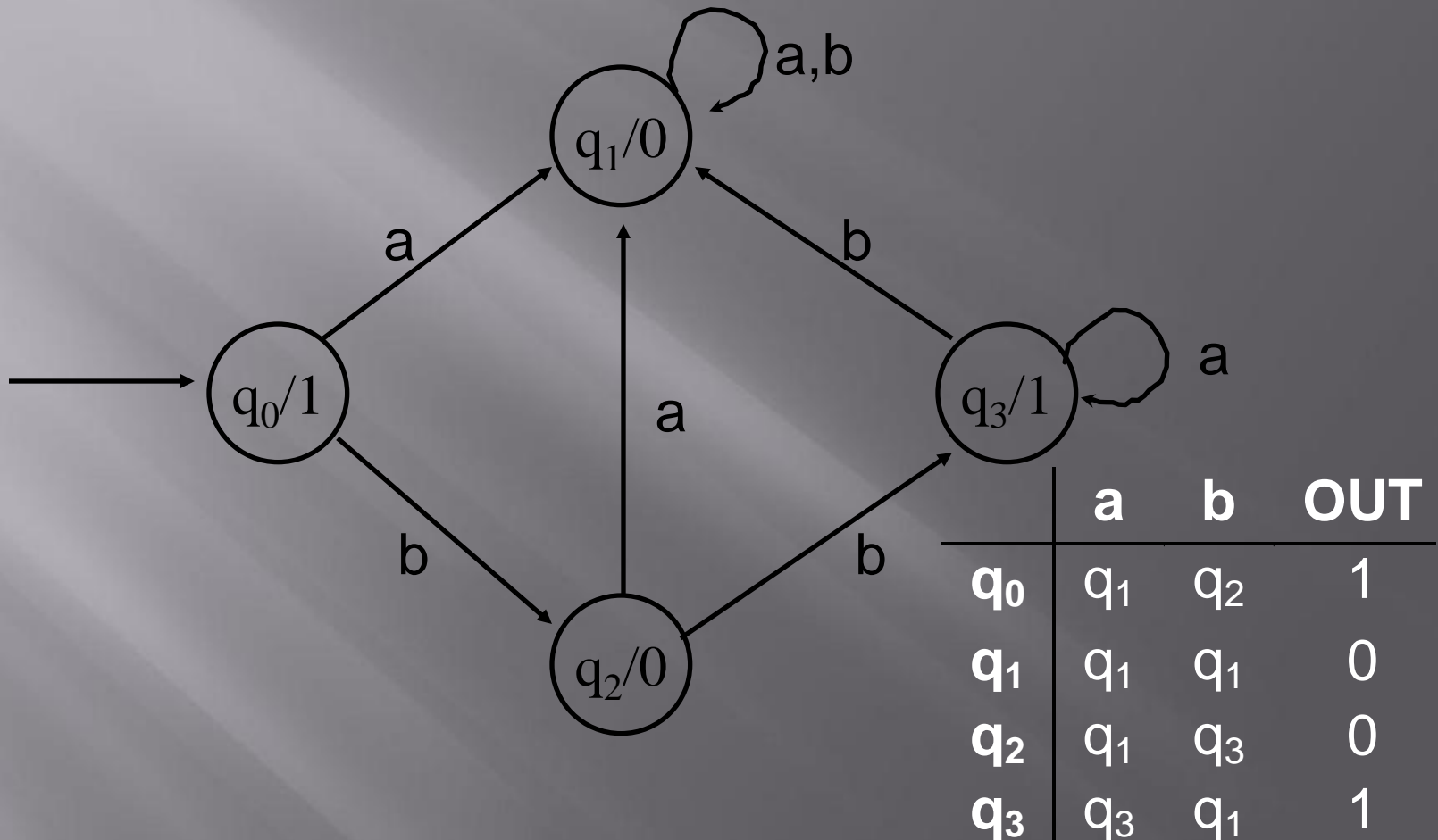


**COURSE:
THEORY OF AUTOMATA
COMPUTATION**

Topics to be covered

- ▣ Mealy Machine
- ▣ Moore Machine

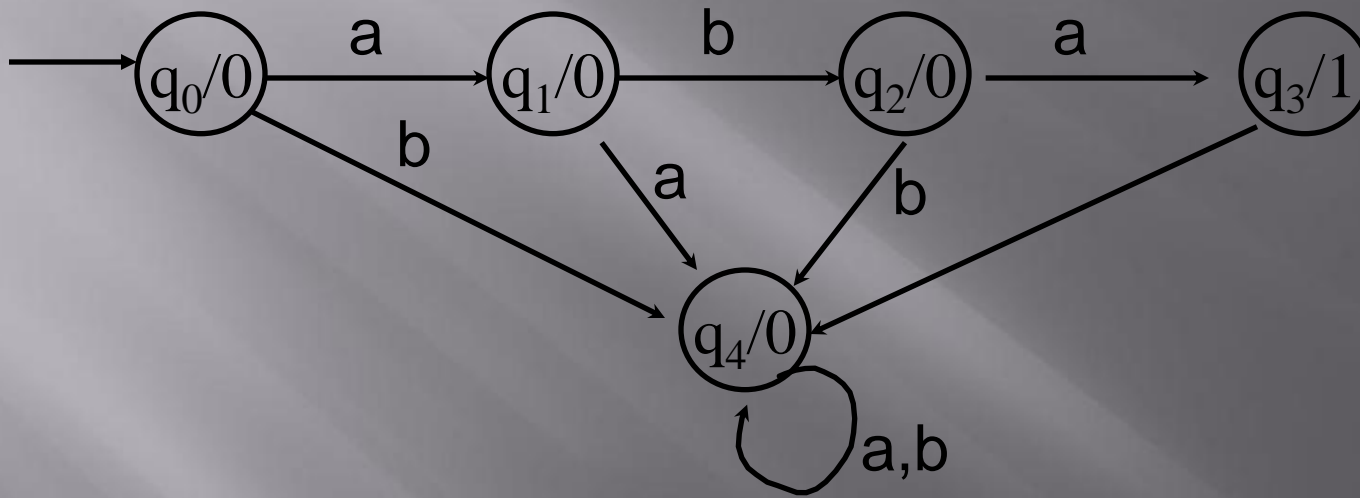
A Moore Machine



Definition of a Moore Machine

- ▣ A finite set of states
 - $q_0, q_1, q_2, \text{ etc.}$
 - q_0 is the start state
- ▣ Alphabet of input letters
- ▣ Alphabet of output letters
- ▣ Transitions
 - A unique one for each letter and each state
- ▣ Output Table
 - A letter for each state

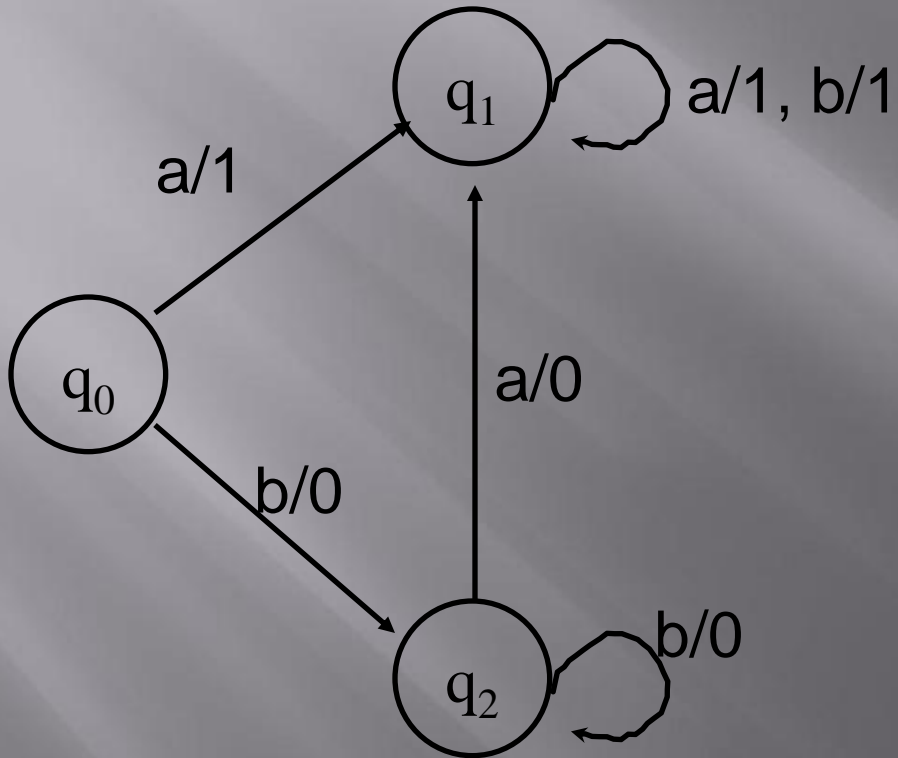
Moore Machine for aba



Defining a Language

- ▣ To change a FA into a Moore machine which accepts the same language
 - Name each state
 - Name the **Start state** q_0
 - Output 0 in all non-final states
 - Output 1 in all **Final states**.
- ▣ A string is accepted if after it has been completed read in the last letter printed is 1.

A Mealy Machine



Q_{old}	IN	Q_{new}	OUT
q_0	a	q_1	1
q_0	b	q_2	0
q_1	a	q_1	1
q_1	b	q_1	1
q_2	a	q_1	0
q_2	b	q_2	0

Definition of a Mealy Machine

- ▣ A finite set of states
 - $q_0, q_1, q_2, \text{ etc.}$
 - q_0 is the start state
- ▣ Alphabet of input letters
- ▣ Alphabet of output letters
- ▣ Transitions
 - A unique one for each letter and each state
 - Each transition also has one output letter

Equivalence of Machines

- Every Moore machine can be turned into a Mealy machine.
- Every Mealy machine can be turned into a Moore machine.
- Every regular language can be defined by Moore machine or a Mealy machine.
- All languages defined by a Moore machine or a Mealy machine are regular.