

# Finite State Machine

A Finite State Machine (FSM), or Finite Automata, is a mathematical model of a system whose state is capable of changing. These systems have characteristics or behaviors that vary depending on the current state. In general, FSMs are divided into two types: FSMs with output and FSMs without output.

However, in this module, only FSMs with output will be discussed. FSMs with output can be divided into 2 types, namely Mealy Machine and Moore Machine.

## Mealy Machine

Mealy State Machine is an FSM in which the next state is determined by the current input and the present state. Different inputs, along with different present states, will result in different next states. For example, in digital circuits, Registers exhibit this characteristic. In everyday life, the change in state of a substance can be modeled as a Mealy State Machine.

Mealy State Machine

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Mealy State Machine Circuit

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## Moore Machine

Moore State Machine is a type of FSM where the next state is only determined by the current state, without being affected by inputs. This means that any input will not change the next state. The hallmark of a Moore State Machine is its one-way cycle structure. For example, digital circuits such as counters exhibit this property. In everyday life, the metamorphosis cycle in animals can be modeled as a Moore State Machine.

Moore State Machine

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Moore State Machine Circuit

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