# SNS COLLEGE OF ENGINEERING

**Kurumbapalayam(Po), Coimbatore – 641 107**
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## Department of Artificial Intelligence and Data Science

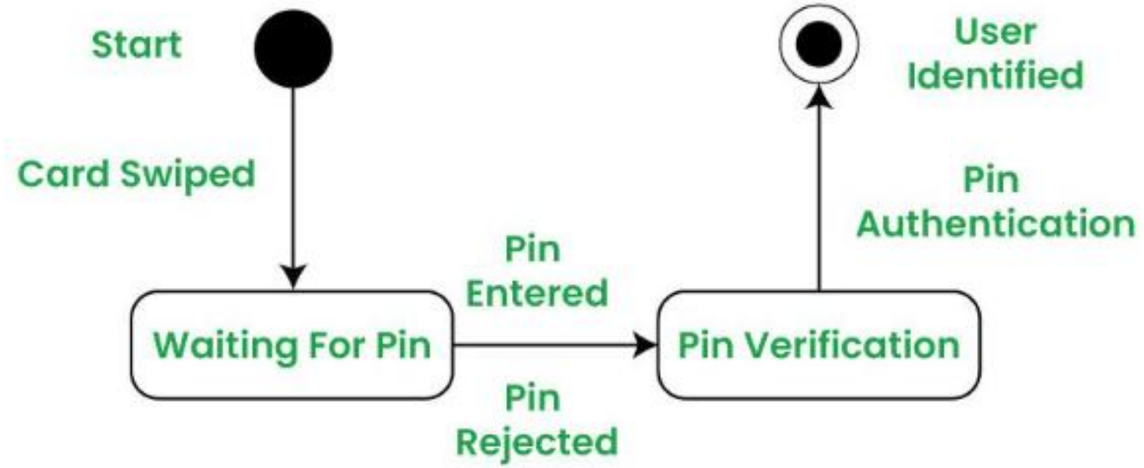
# State Machine Diagrams

# What is a State Machine Diagram?

- A state diagram is a UML diagram which is used to represent the condition of the system or part of the system at finite instances of time. It’s a behavioral diagram and it represents the behavior using finite state transitions.
- State Machine diagrams are also known as State Diagrams and State-Chart Diagrams. These both terms can be used interchangeably.
- A state machine diagram is used to model the dynamic behavior of a class in response to time and changing external stimuli( events that causes system to changes its state from one to another).
- We can say that each and every class has a state but we don’t model every class using State Machine diagrams.

# EXAMPLE

A State Machine Diagram for user verification



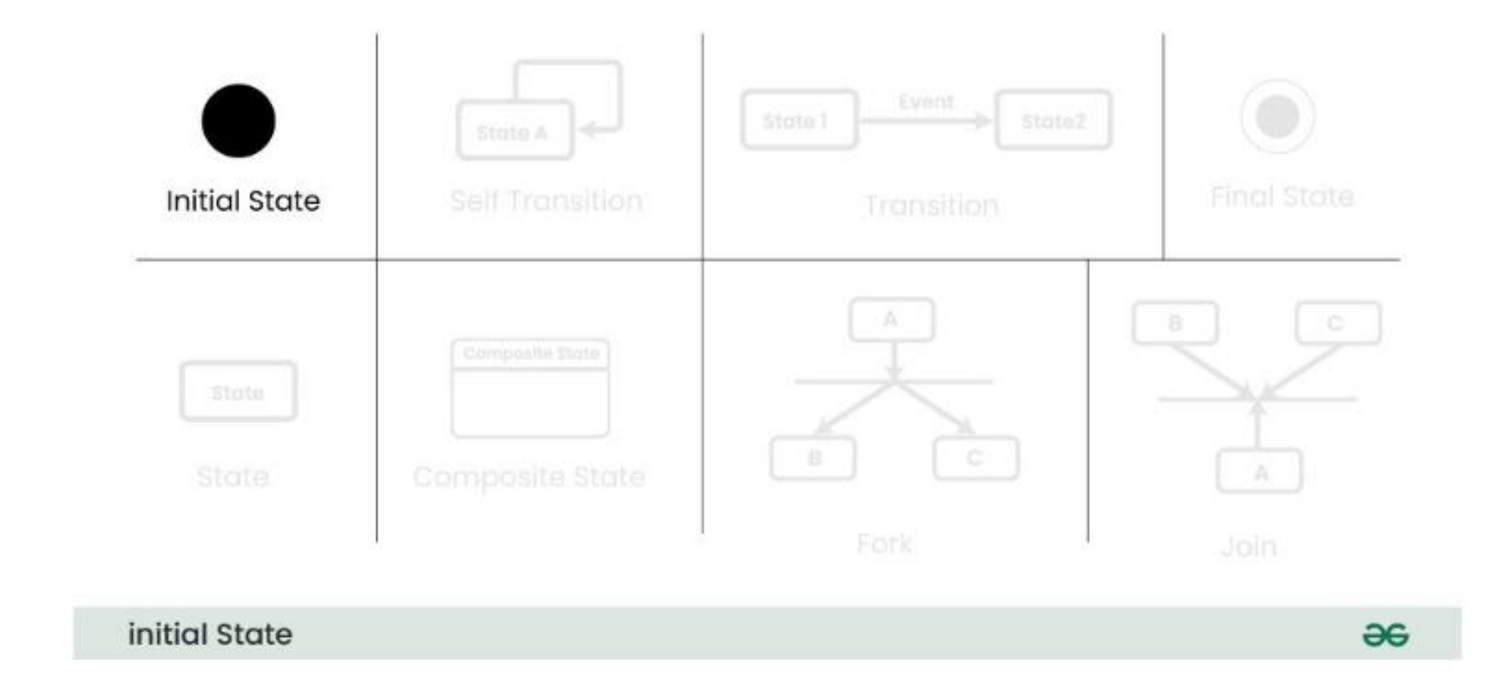

State Machine Diagrams | Unified Modeling Language (UML)

*The State Machine Diagram above shows the different states in which the verification sub-system or class exist for a particular system.*

# Basic components and notations of a State Machine diagram

**1. Initial state**

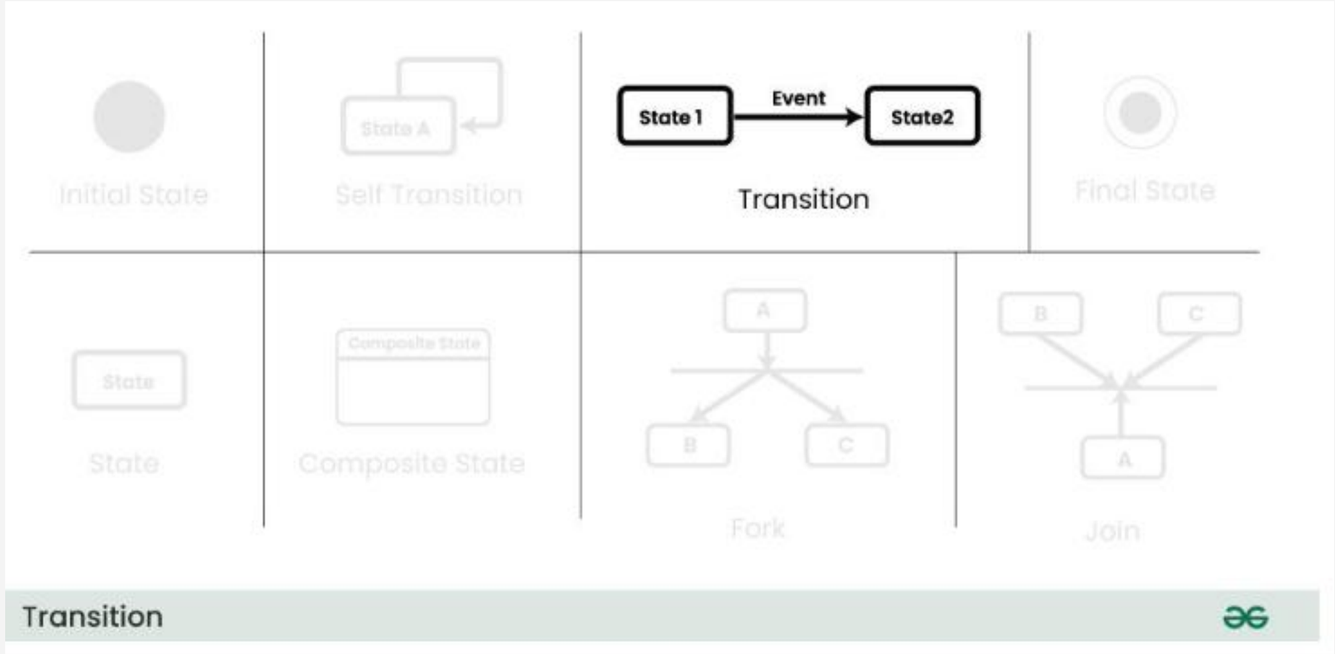
We use a black filled circle represent the initial state of a System or a Class.



# Basic components and notations of a State Machine diagram

**2. Transition**

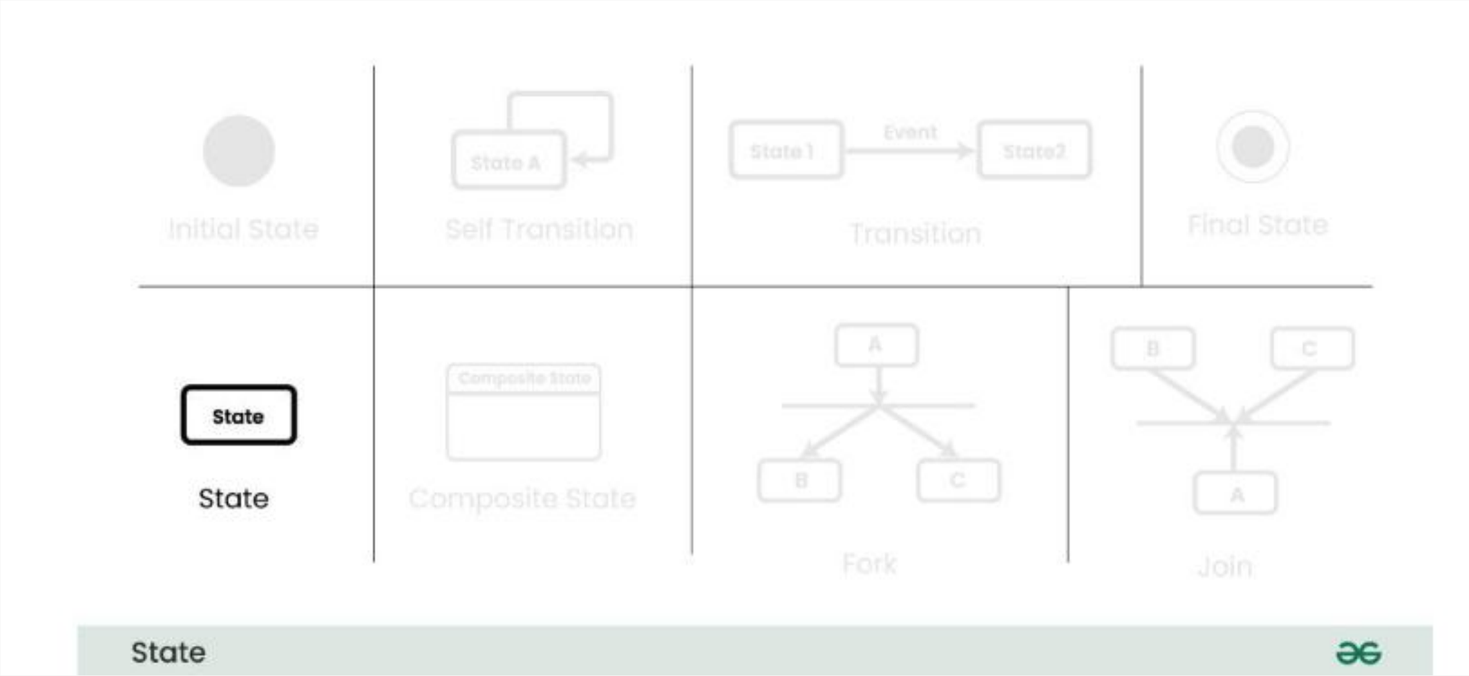
We use a solid arrow to represent the transition or change of control from one state to another. The arrow is labelled with the event which causes the change in state.



# Basic components and notations of a State Machine diagram

**3. State**

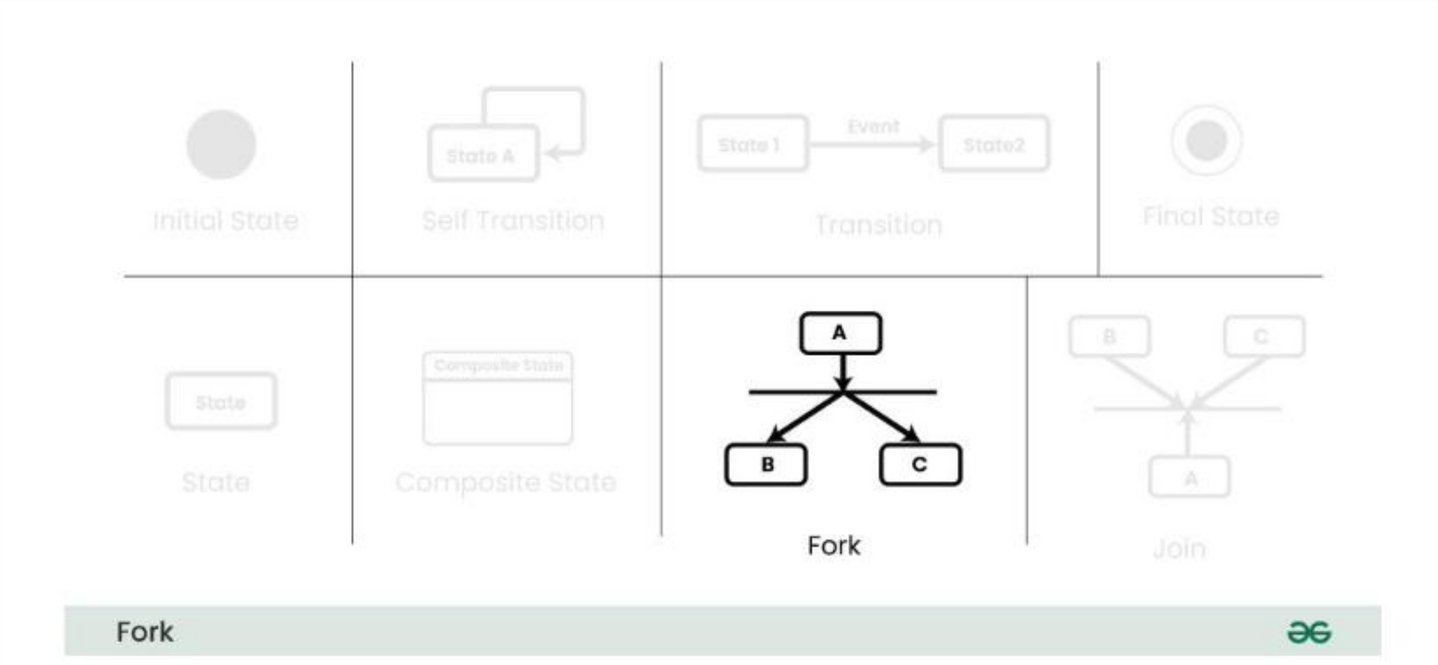
We use a rounded rectangle to represent a state. A state represents the conditions or circumstances of an object of a class at an instant of time.



# Basic components and notations of a State Machine diagram

**4. Fork**

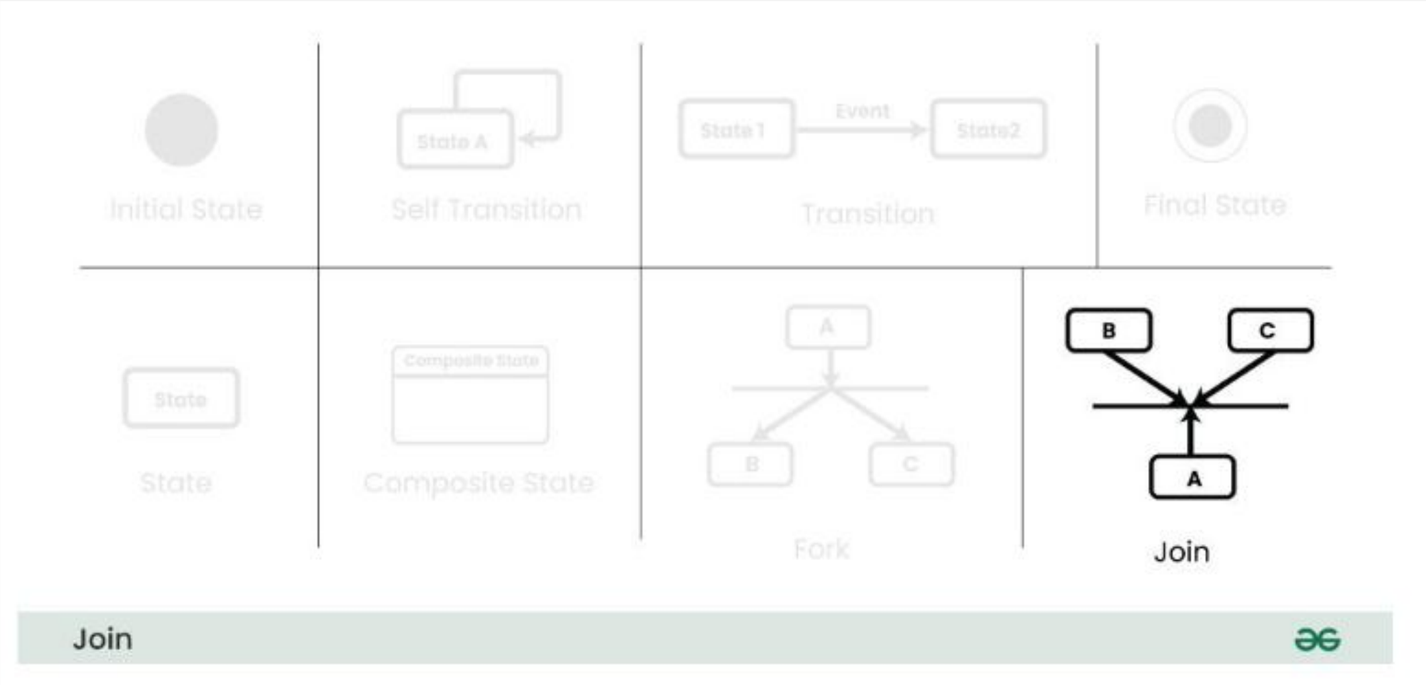
We use a rounded solid rectangular bar to represent a Fork notation with incoming arrow from the parent state and outgoing arrows towards the newly created states. We use the fork notation to represent a state splitting into two or more concurrent states.



# Basic components and notations of a State Machine diagram

**5. Join**

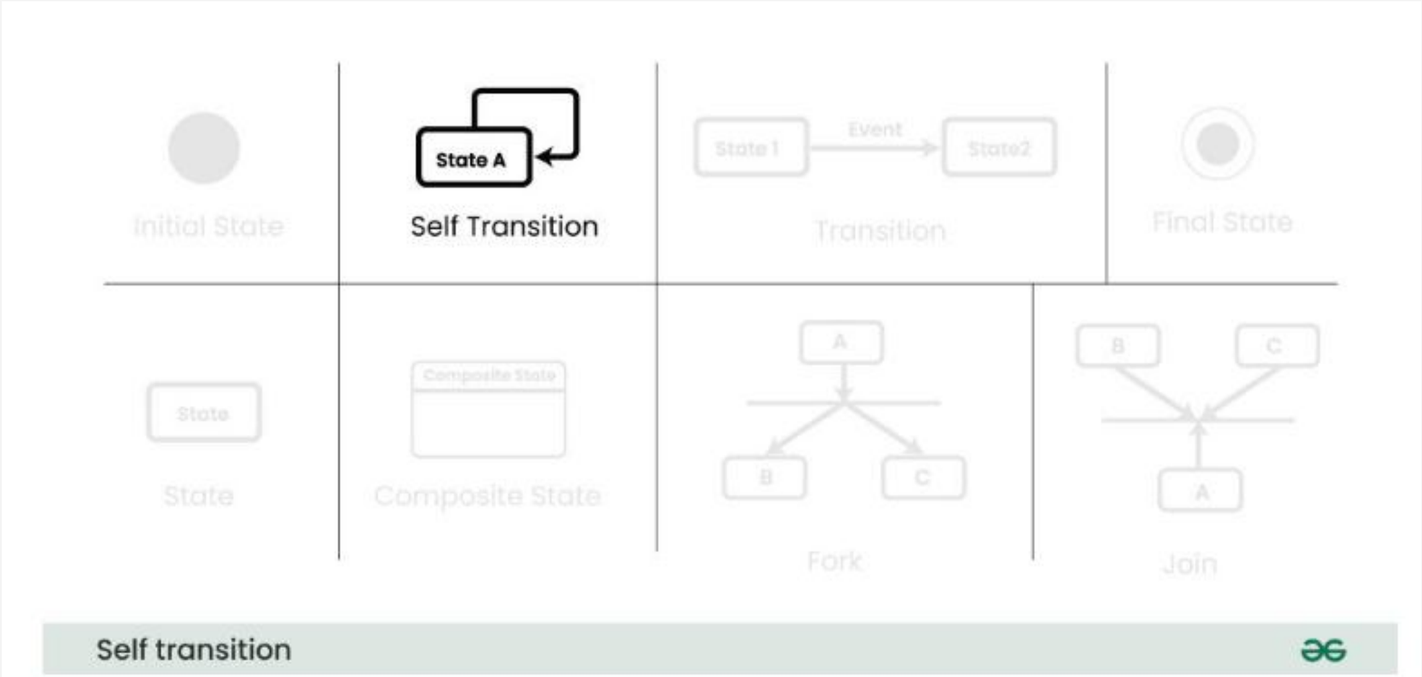
We use a rounded solid rectangular bar to represent a Join notation with incoming arrows from the joining states and outgoing arrow towards the common goal state. We use the join notation when two or more states concurrently converge into one on the occurrence of an event or events.



# Basic components and notations of a State Machine diagram

**6. Self transition**

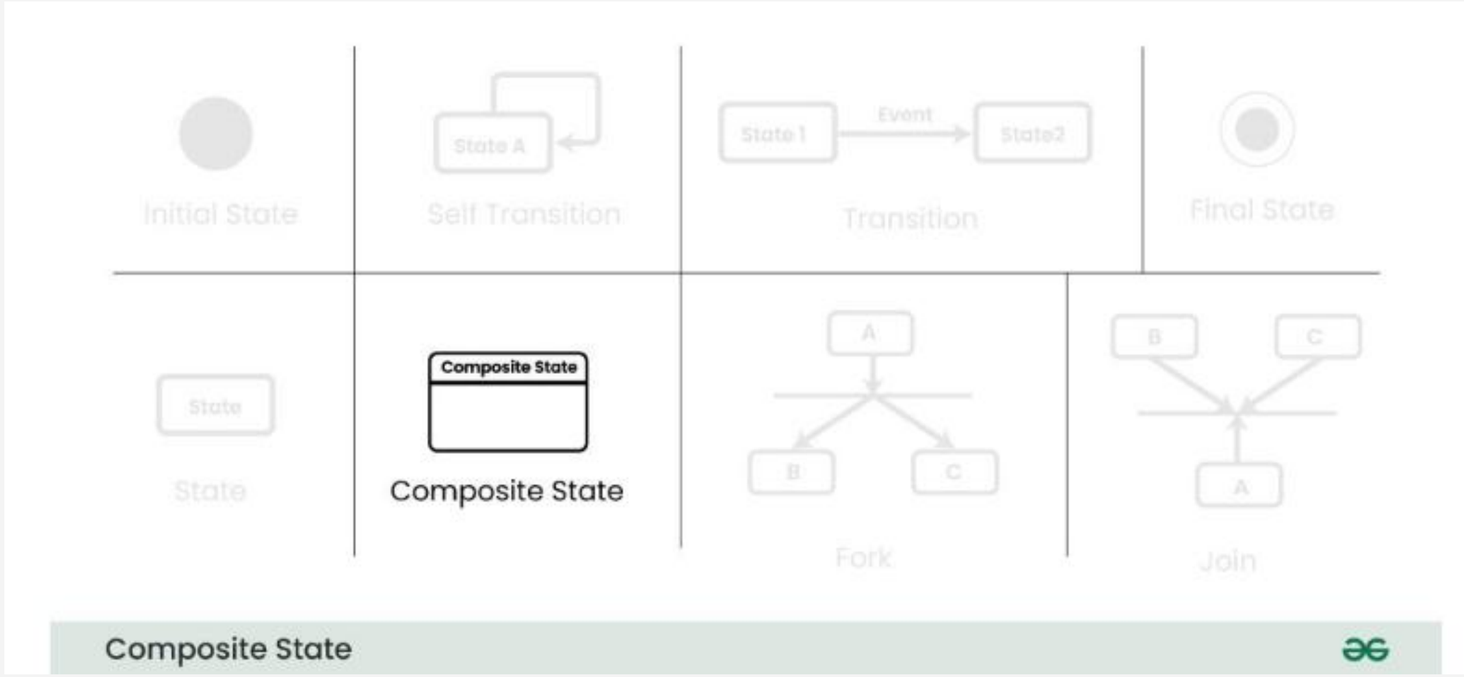
We use a solid arrow pointing back to the state itself to represent a self transition. There might be scenarios when the state of the object does not change upon the occurrence of an event. We use self transitions to represent such cases.



# Basic components and notations of a State Machine diagram

**7. Composite state**

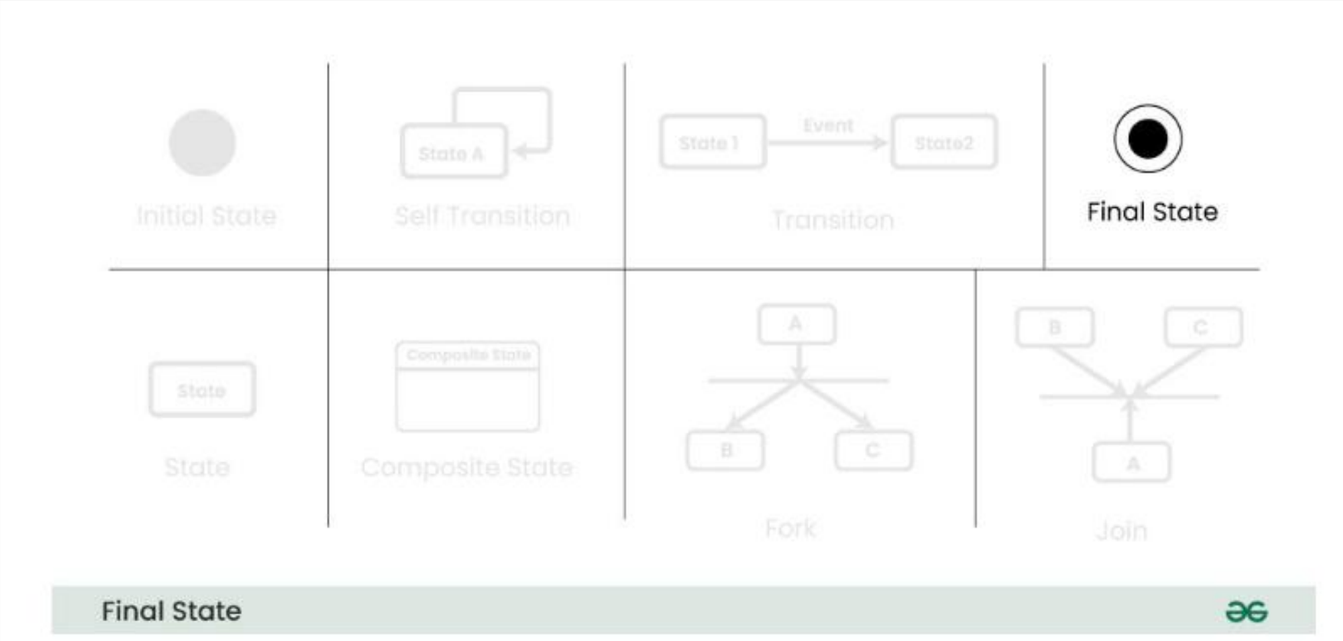
We use a rounded rectangle to represent a composite state also. We represent a state with internal activities using a composite state.



# Basic components and notations of a State Machine diagram

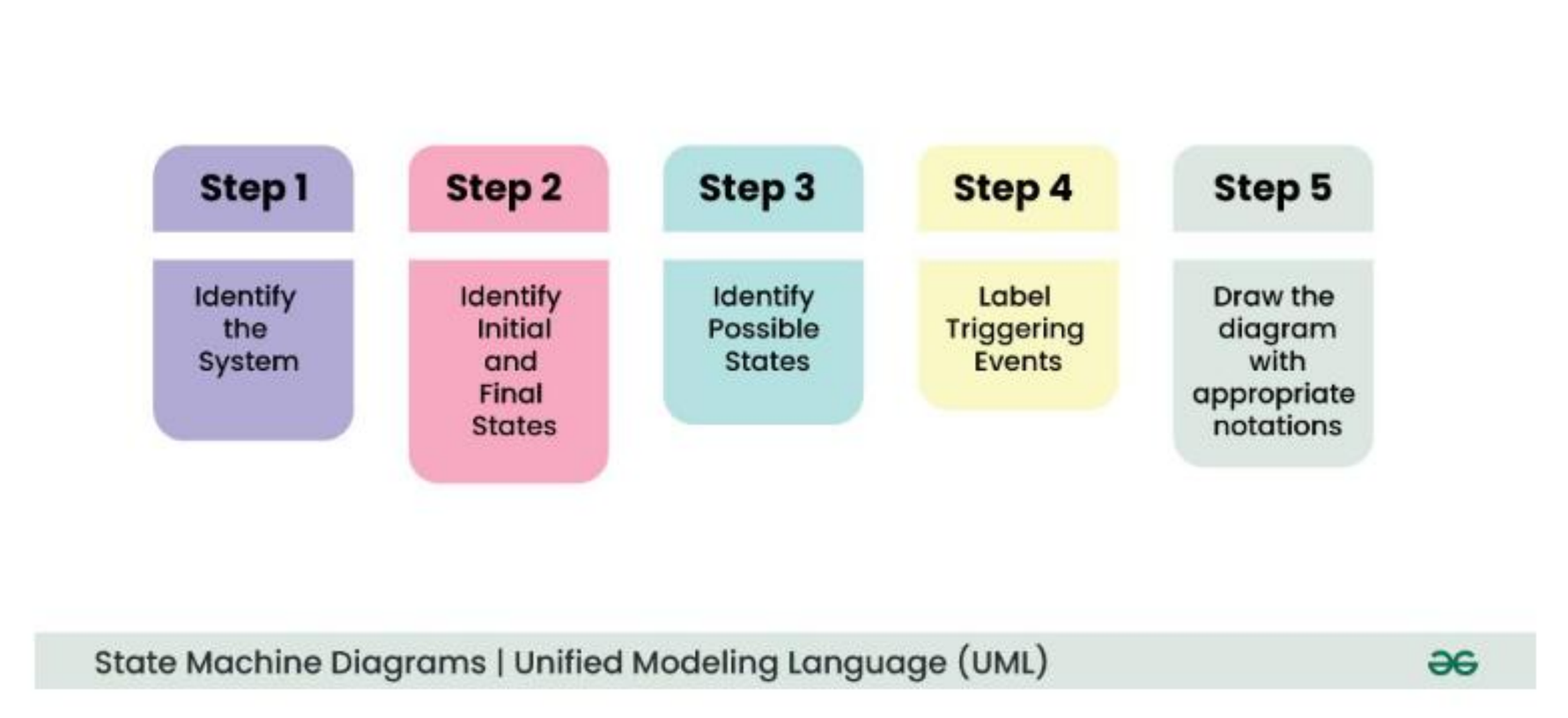
**8. Final State**

We use a filled circle within a circle notation to represent the final state in a state machine diagram.



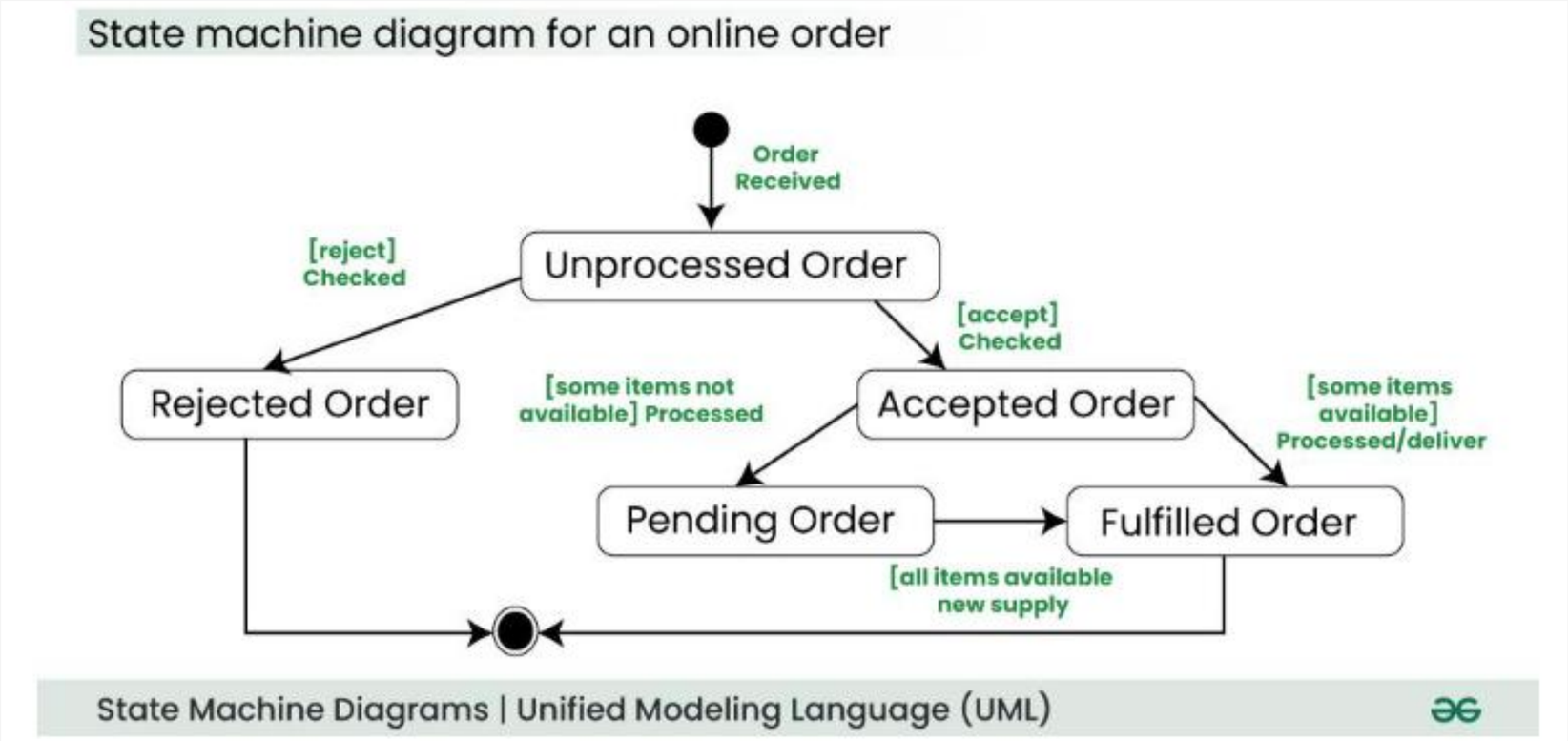
# How to draw a State Machine diagram in UML?

Below are the steps of how to draw the State Machine Diagram in UML:



# Example for State Machine Diagrams- online order

Below are the steps of how to draw the State Machine Diagram in UML:




thank
you