Finite State Machines in Unity

MANAGING STATE

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What is state?

State

State is the condition of something variable.

States of Matter

Solid

Liquid

Gas

Examples of State in Games

Game State

Player State

NPC State

What Is a Finite State Machine?

Finite State Machine

A Finite State Machine is an abstract machine that can be in exactly one of a finite number of states at any given time.

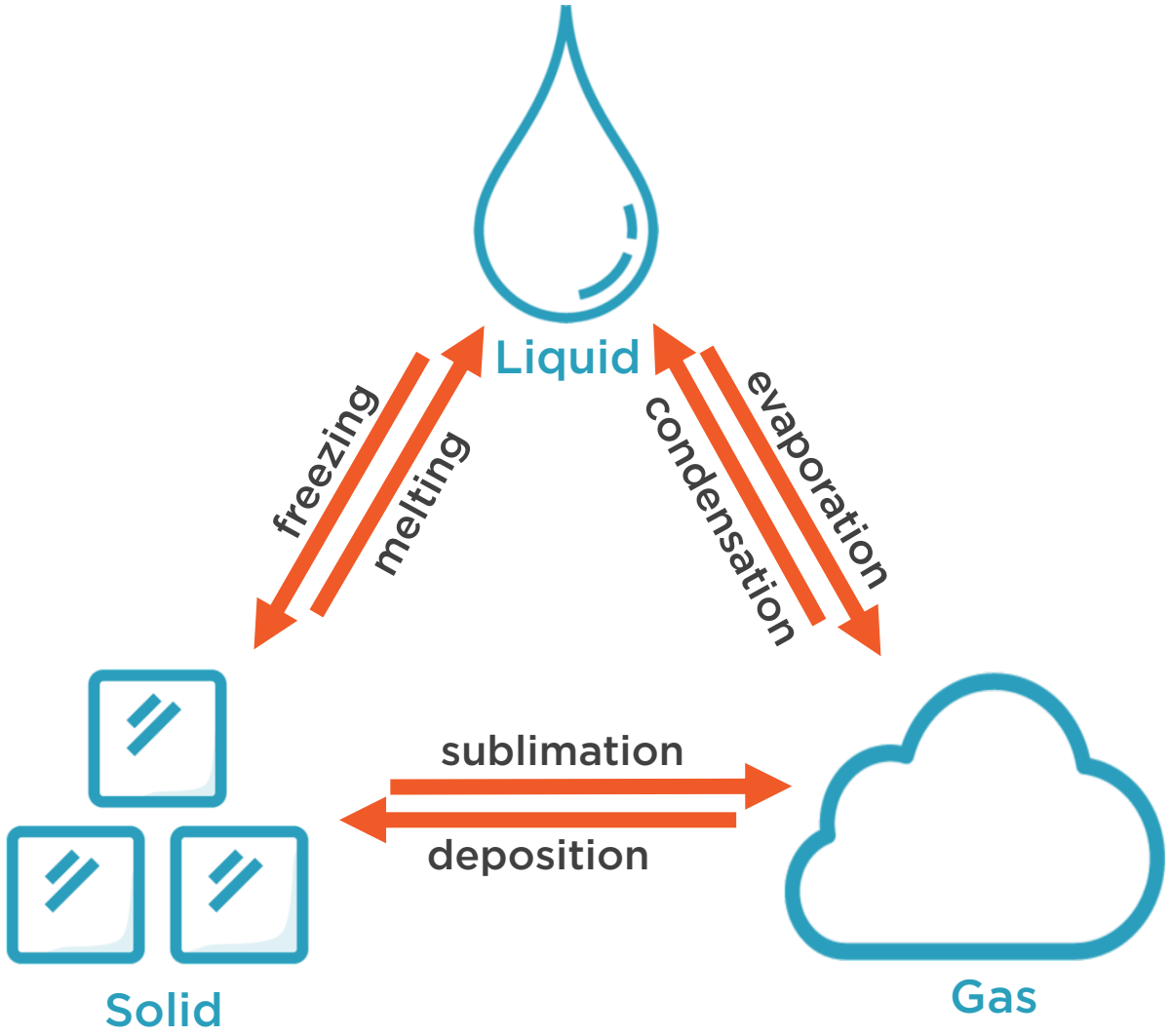
What Is a Finite State Machine?

A list of possible states

The conditions for transitioning between those states

The state its in when initialized, or its initial state

Matter as a Finite State Machine

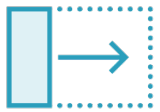


Benefit of Finite State Machines

Readability

Maintainability

Easier to debug



Extensibility

Coming Up

Getting Started

Finite State Machines in Unity.zip

Coming Up

A Naive Approach to Managing State

Coming Up

Actions, Triggers, & Conditions

Jump Behavior

Actions	Triggers	Conditions
Arthur jumps Jumping expression	Spacebar is pressed	Arthur is not jumping

Idle Behavior

Actions	Triggers	Conditions
Arthur stands guard	Scene loads	New game
Idle expression	End of jump	Arthur is jumping

Duck Behavior

Actions	Triggers	Conditions
Arthur ducks	C button is pressed	Arthur is not jumping
Ducking expression		

Idle Behavior

Actions	Triggers	Conditions
Arthur stands guard	Scene loads	New game
Idle expression	End of jump	Arthur is jumping
	C button released	

Jump Behavior

Actions	Triggers	Conditions
Arthur jumps	Spacebar is pressed	Arthur is not jumping
Jumping expression		Arthur is not ducking

Coming Up

Completing the Naive Implementation

Spin Behavior

Actions	Triggers	Conditions
Arthur spins	C button is pressed	Arthur is jumping
Spinning expression		

Swap Weapon Behavior

Actions	Triggers	Conditions
Arthur changes weapon	X button is pressed	Arthur is not jumping Arthur is not ducking Arthur is not spinning

Coming Up

Module Conclusion

Module Summary

What is state?

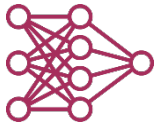
- How does it apply to game development?

Finite State Machines

A naive approach to managing state

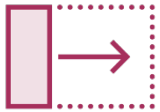
Behavior

The Naive Approach



Interdependent logic

Time lost managing fields



Difficult to extend

Harder to debug and manage

Focus on state!

Coming Up