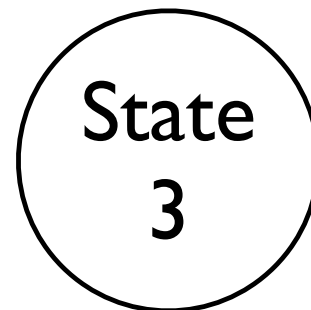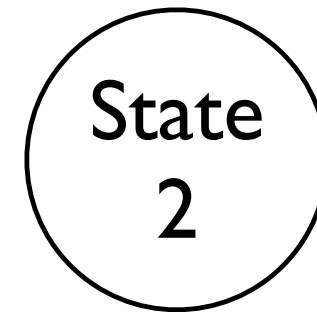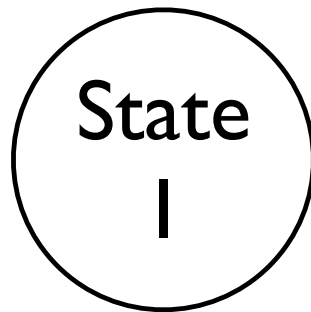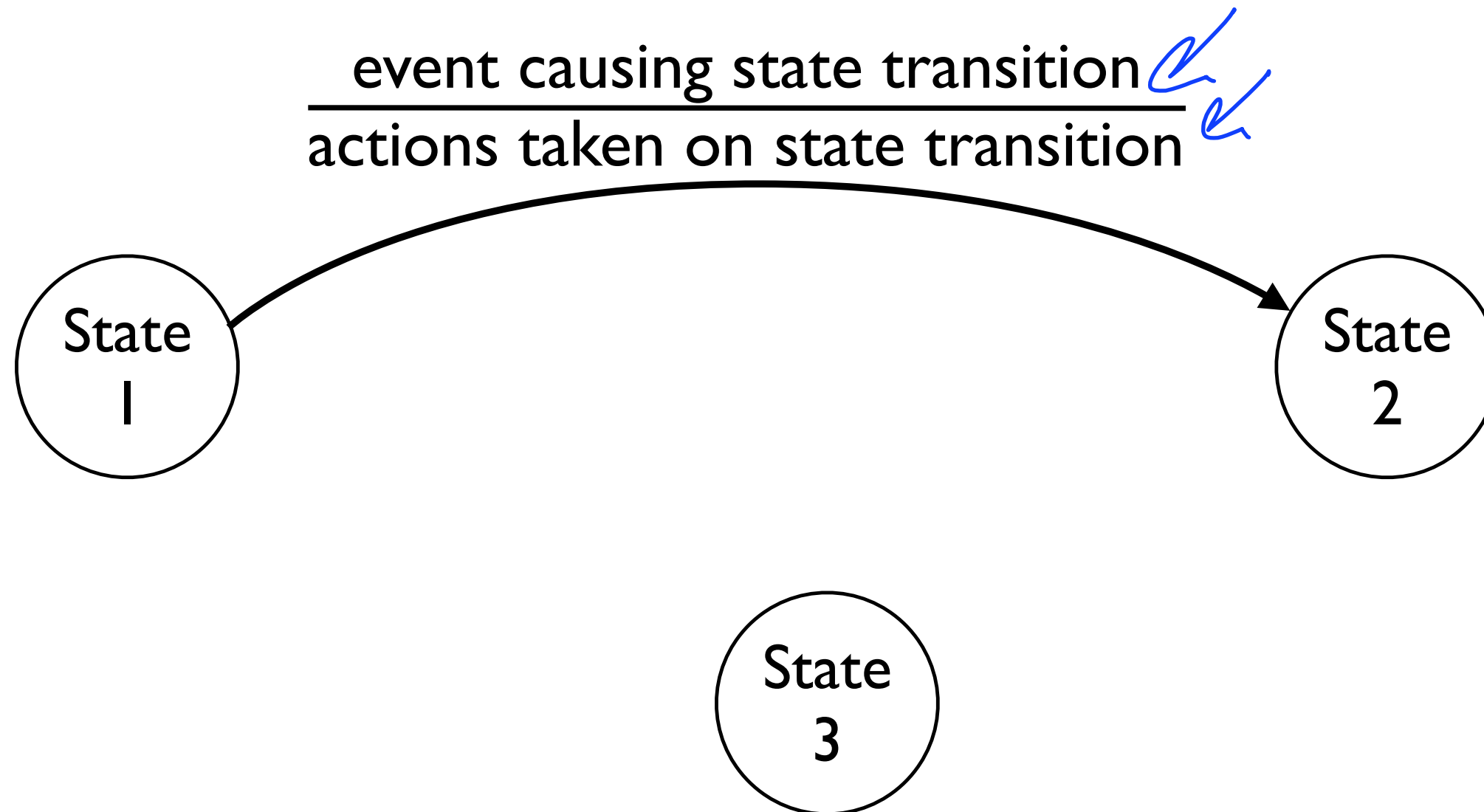# Finite State Machines

Protocol Specification

Finite State Machines

State
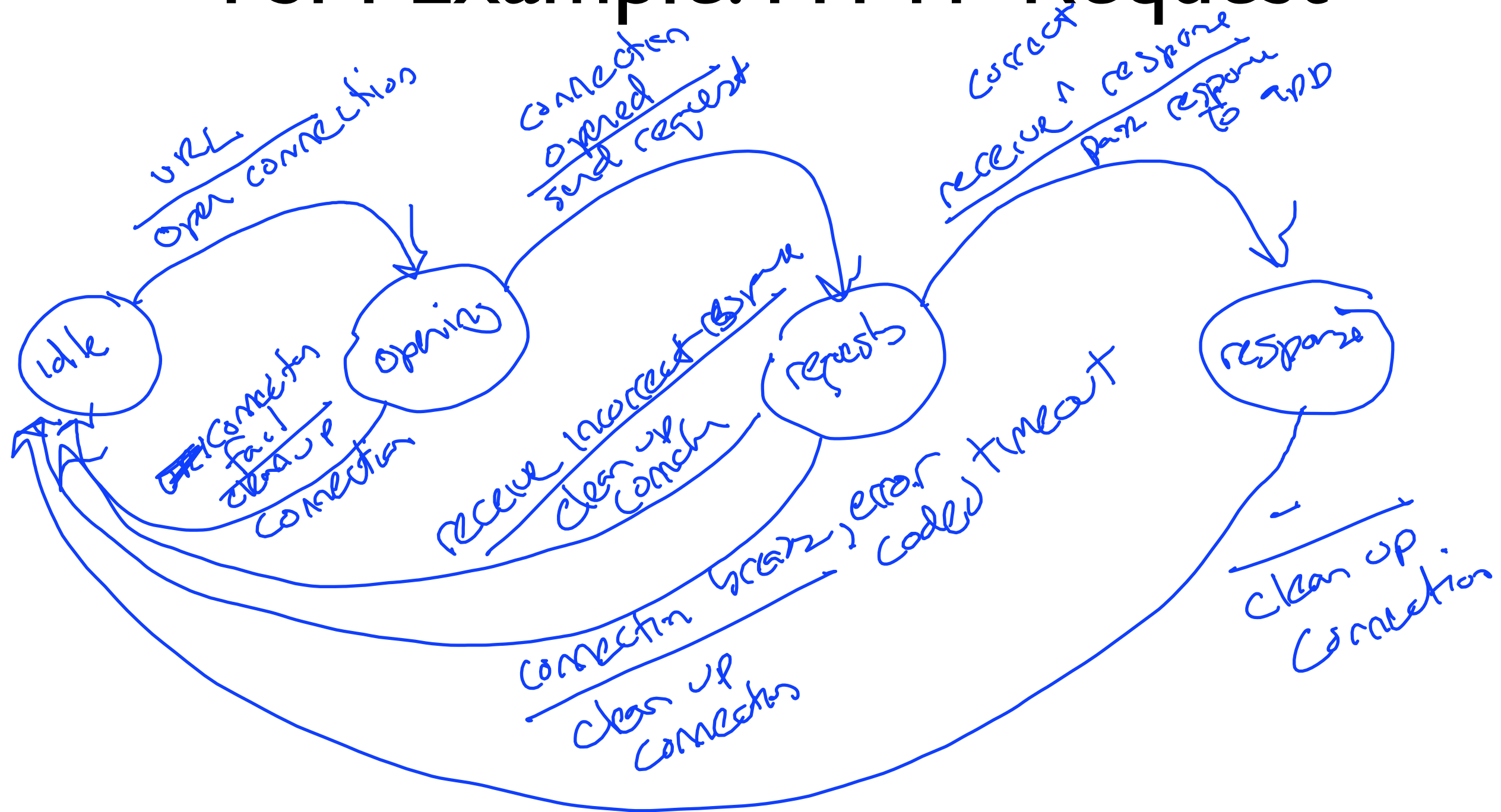1

State
2

State
3

CS144, Stanford University

Finite State Machines

$$\frac{\text{event causing state transition}}{\text{actions taken on state transition}}$$

State
1

State
2

State
3

Finite State Machines

event causing state transition
_____
actions taken on state transition

event
_____
action
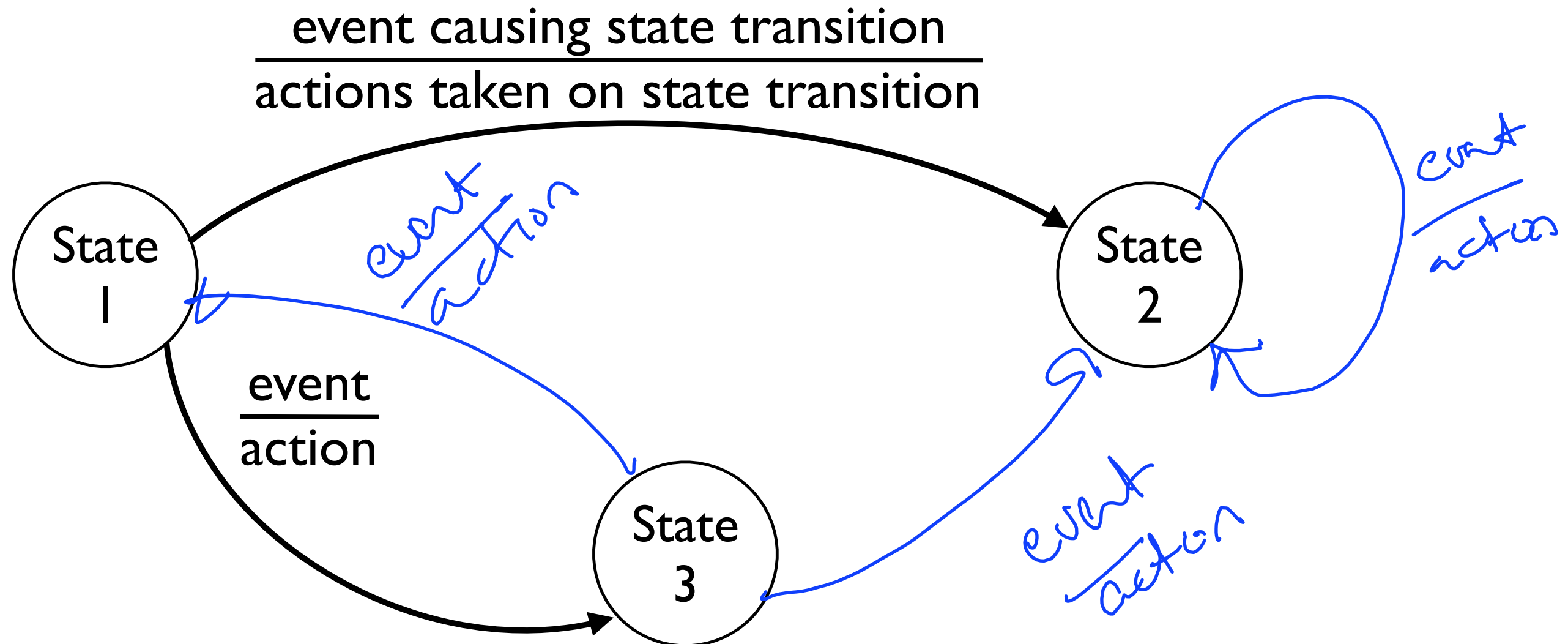
FSM Example: HTTP Request

States: Idle, Opening, Request, Response

Transitions:
- Idle → Opening: URL / open connection
- Opening → Request: connection opened / send request
- Opening → Idle: connection fail / clean up connection
- Request → Idle: receive incorrect response / clean up connection
- Request → Response: correct / received response, pass response to app
- Request → Idle: connection breaks, error codes, timeout / clean up connection
- Response → Idle: clean up connection

FSM Example: TCP Connection