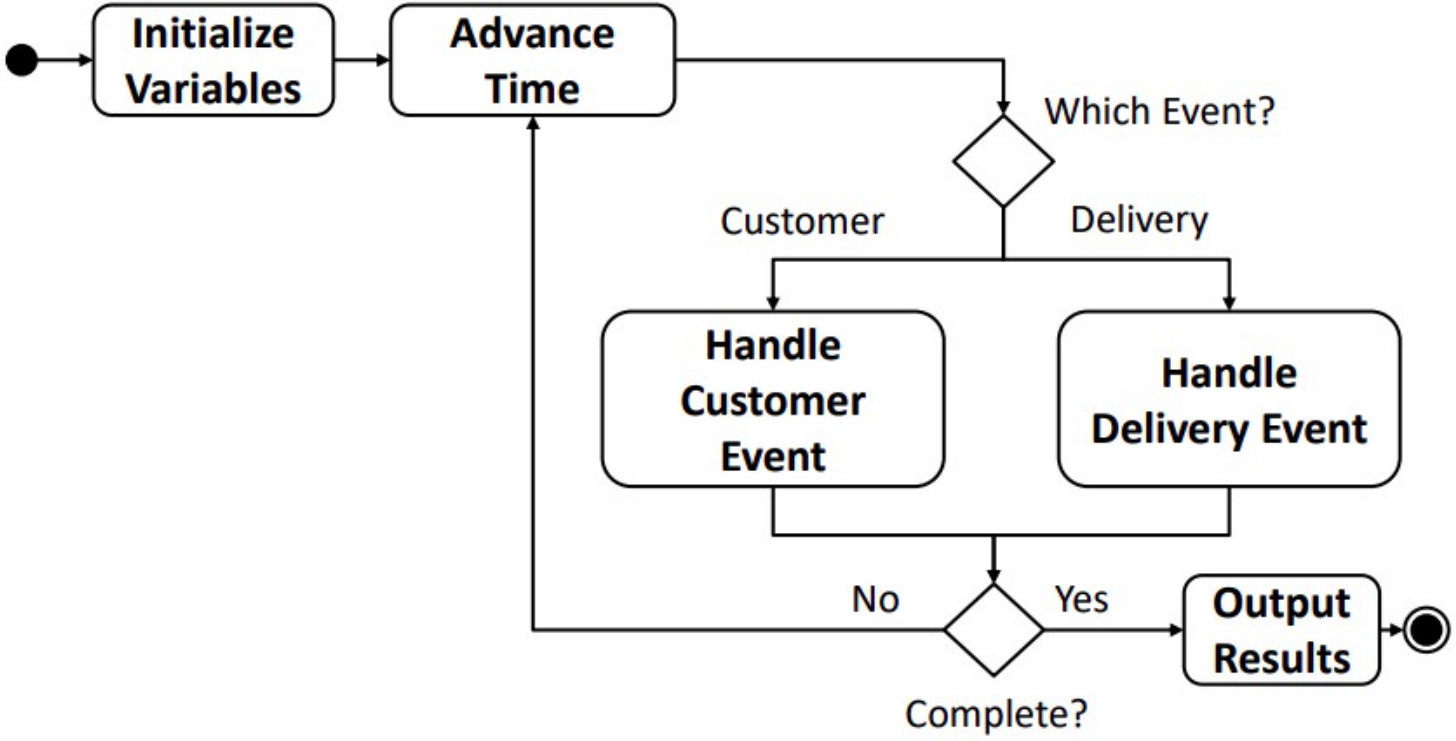
Computer Modeling and Simulation

Lecture 9

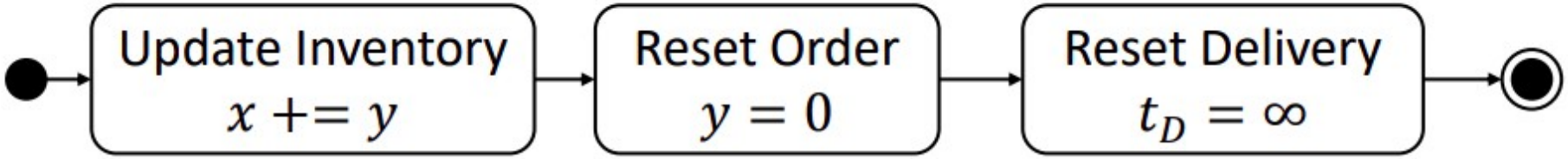
Inventory Model - An Example

- Stock products which sell for r = 100 each
- Customer inter-arrival time d~exponential λ = 5
- Each customer demands products (can only sell stock) D~uniform(1,4)
- Order policy: when inventory is $x < Q$, place an order for $y = S - x$ (only one outstanding order at a time)
- Costs $c\ y = 50 \cdot y$ to order y units
- Delay of L = 2 days until delivery
- Holding cost of h = 2 per item per day

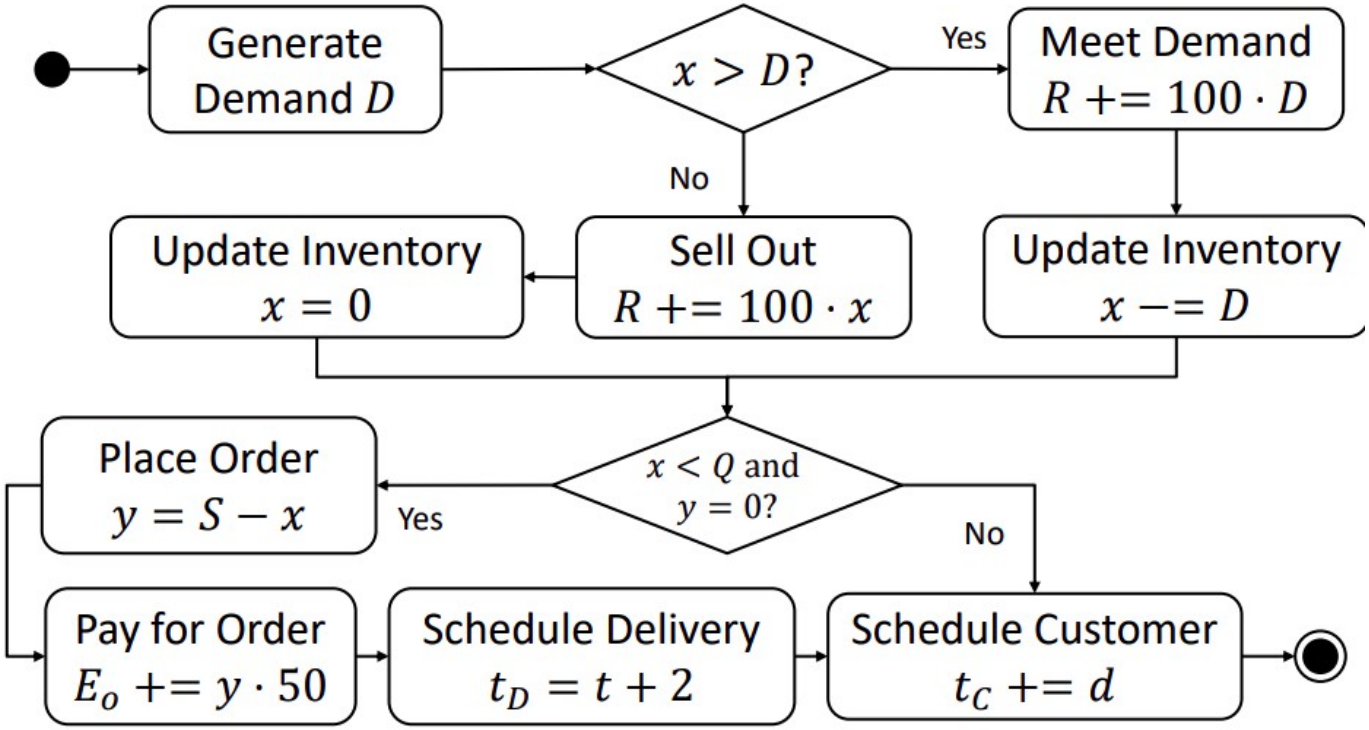
Activity Diagram



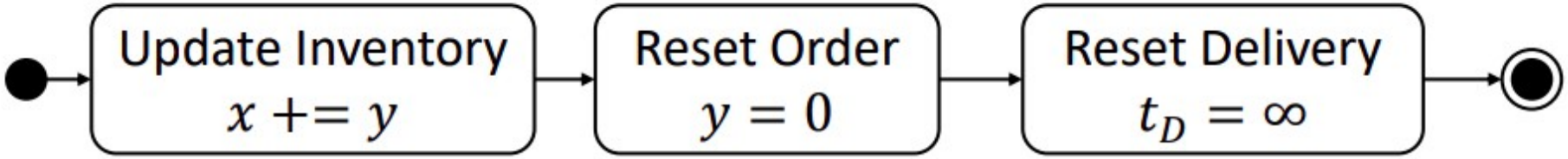
Advance Time



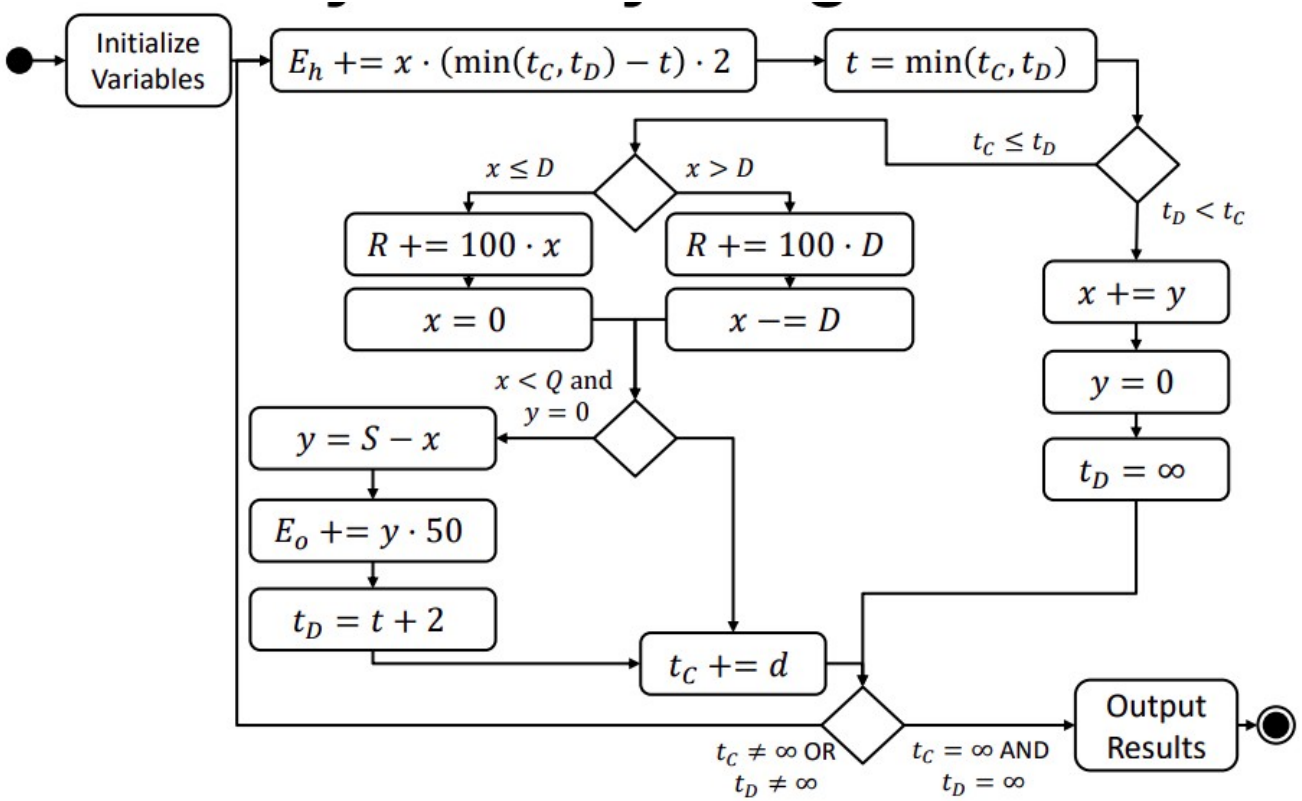
Customer Event



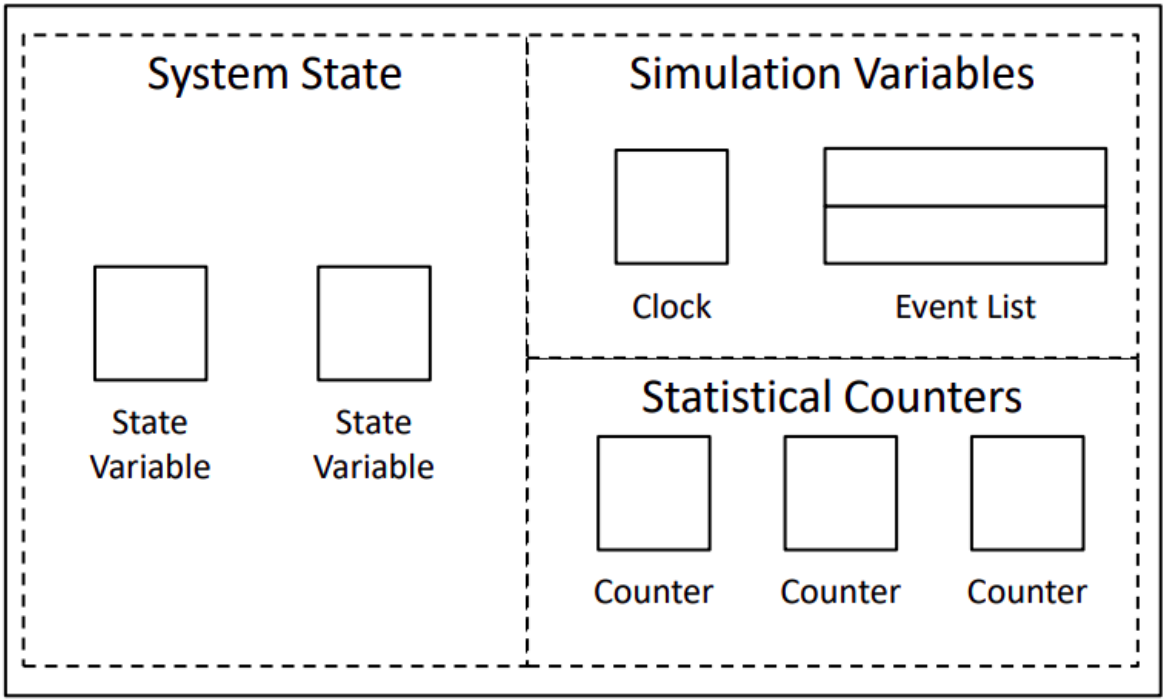
Delivery Event



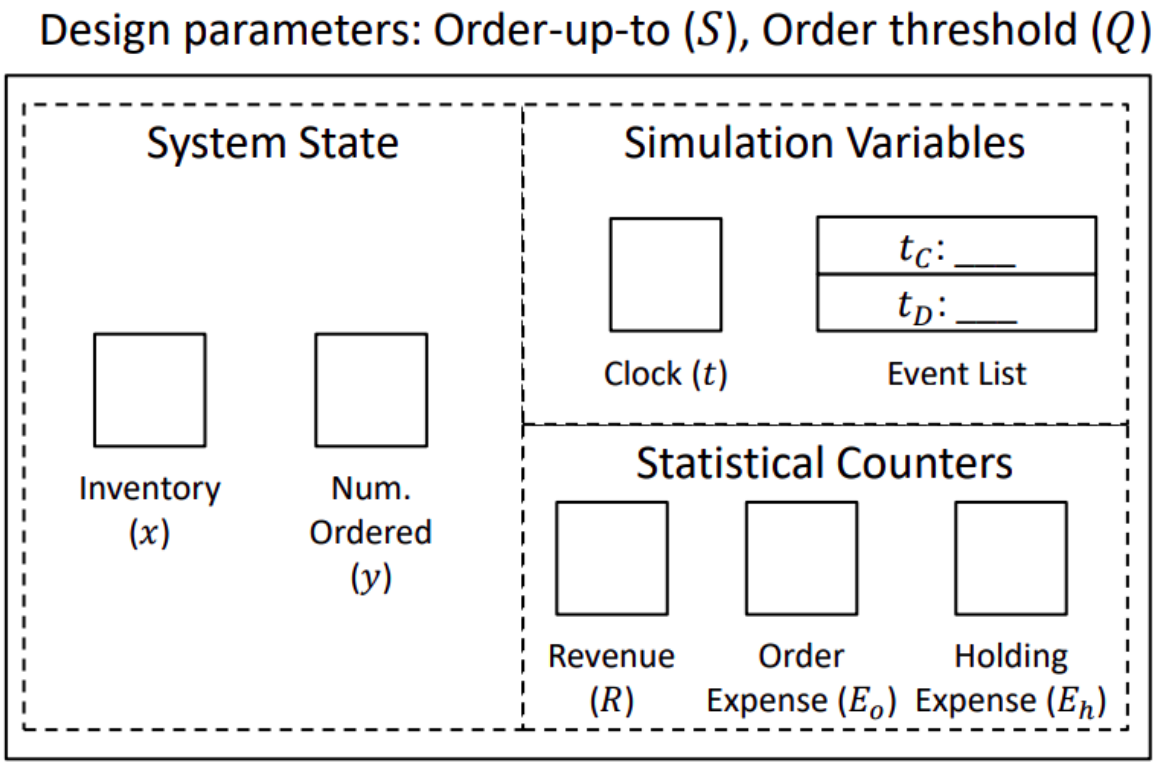
Complete Activity Diagram



Inventory Model Structure

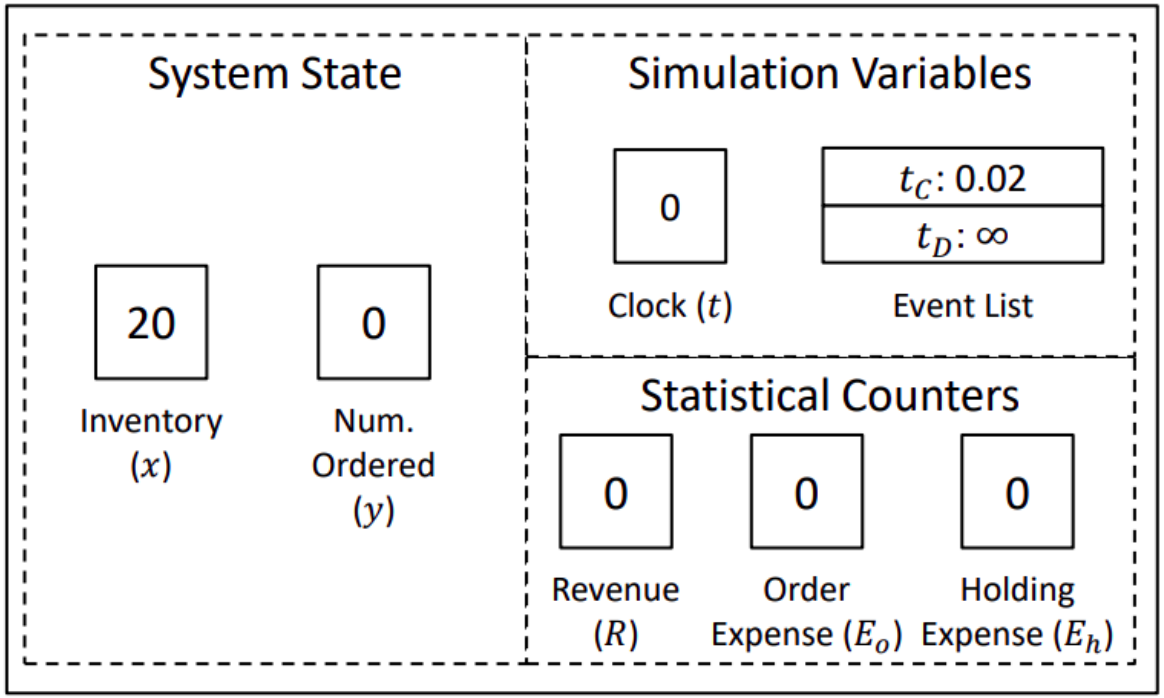


Inventory Model Structure



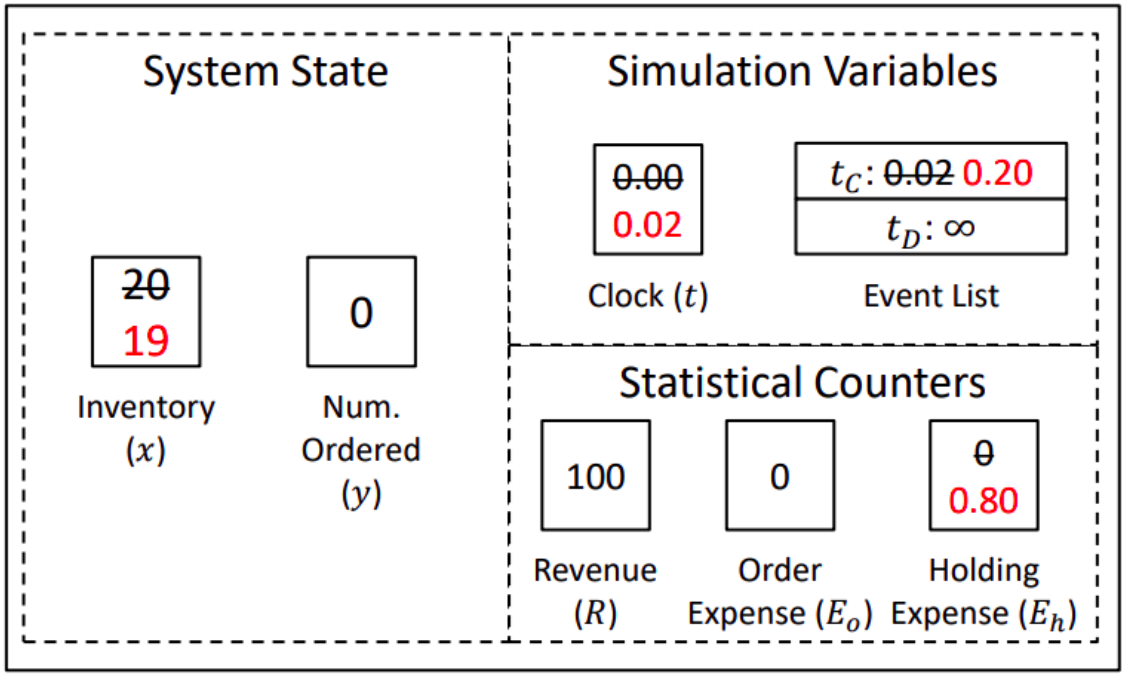
Initialize Simulation

Inter-arrival times: 0.02, 0.18, 0.18, 0.38 Demands: 1, 1, 4, 4



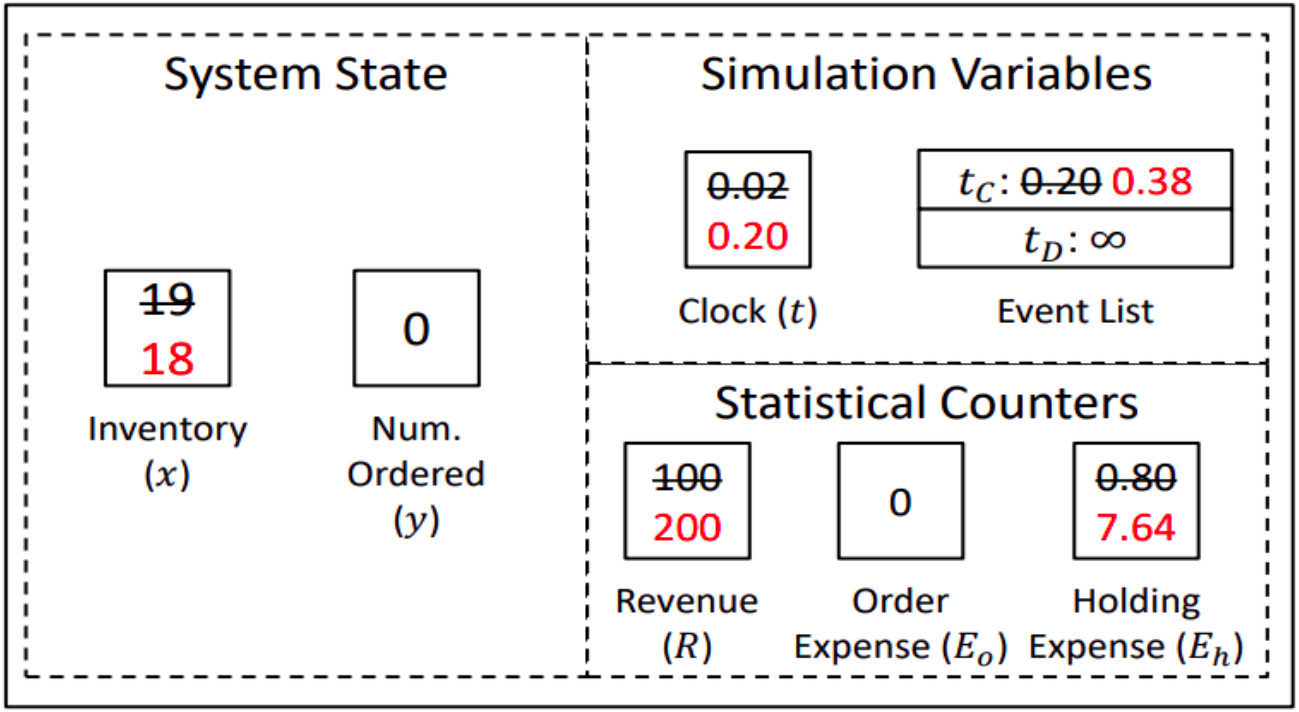
Customer @ $t = 0.02$

Inter-arrival times: ~~0.02~~, 0.18, 0.18, 0.38 Demands: 1, 1, 4, 4



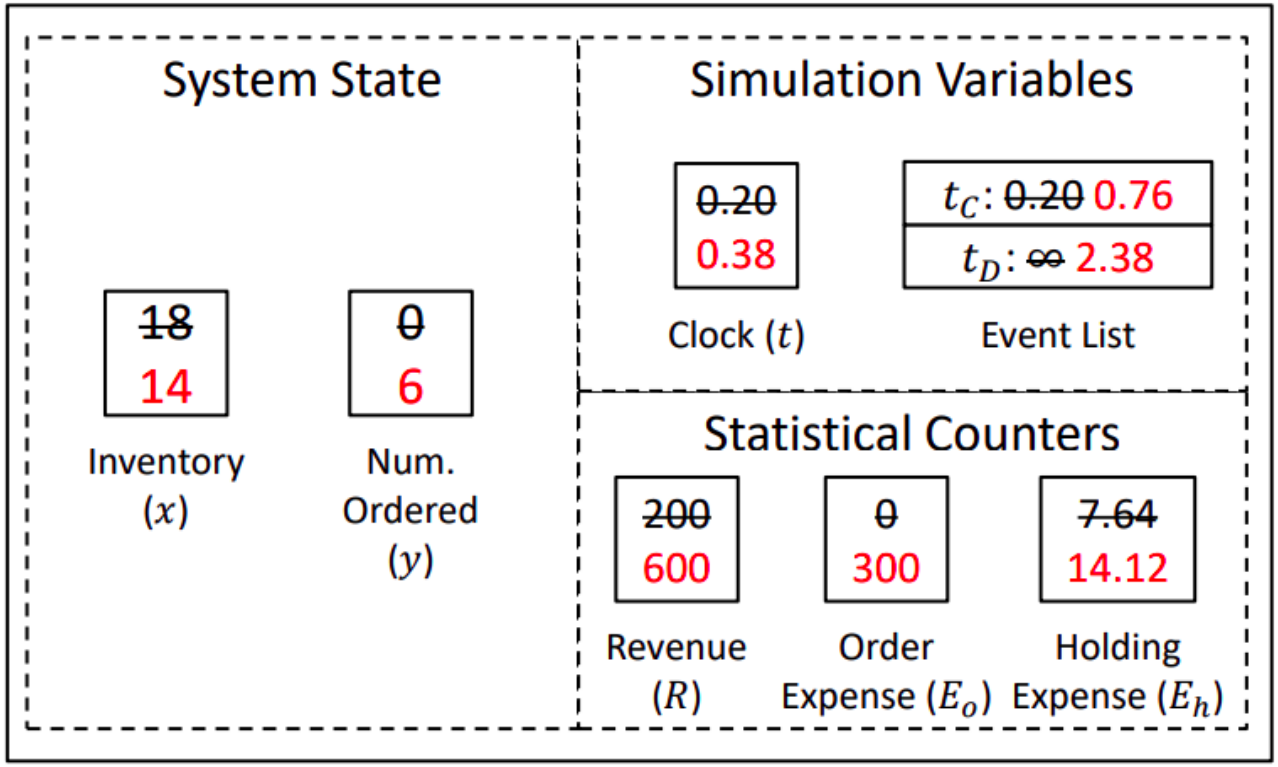
Customer @ $t = 0.20$

Inter-arrival times: ~~0.02~~, ~~0.18~~, 0.18, 0.38 Demands: ~~1~~, 1, 4, 4



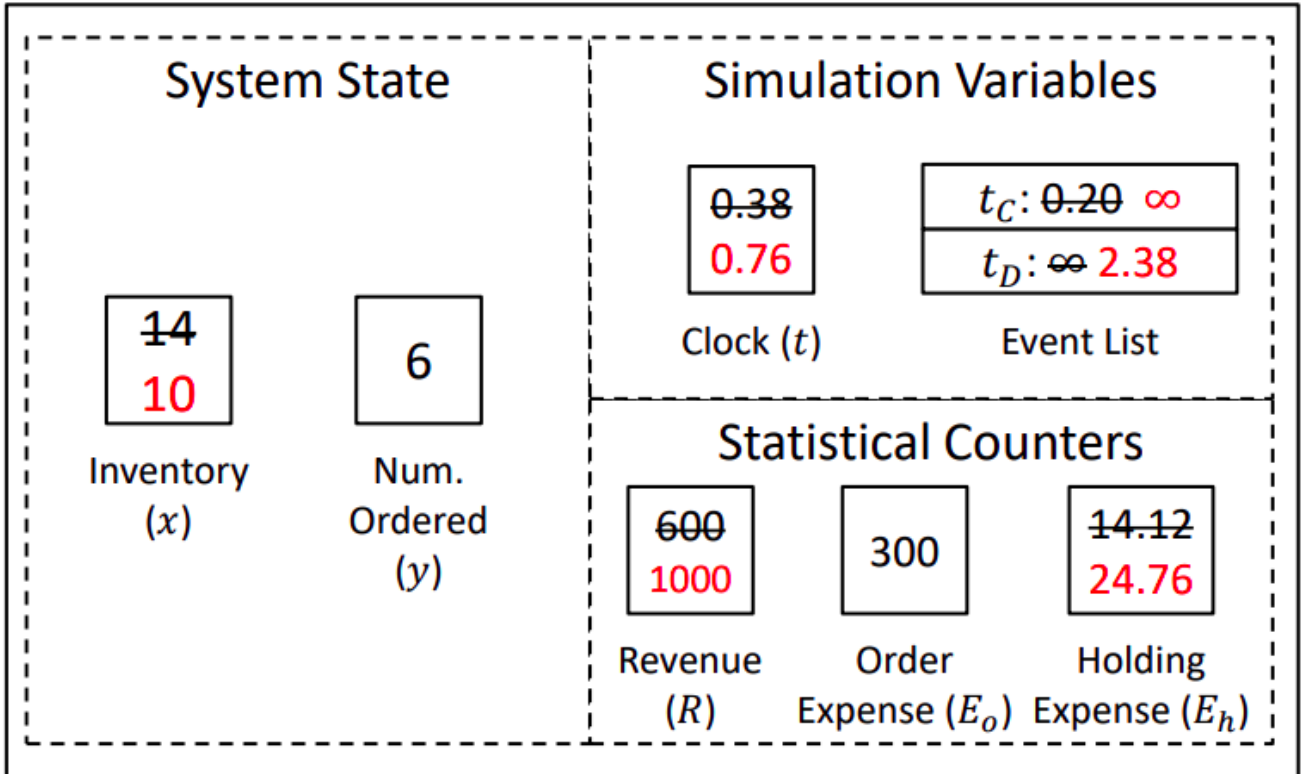
Customer @ $t = 0.38$

Inter-arrival times: ~~0.02~~, ~~0.18~~, ~~0.18~~, 0.38 Demands: ~~1~~, ~~1~~, 4, 4



Customer at t=0.76

Inter-arrival times: ~~0.02~~, ~~0.18~~, ~~0.18~~, ~~0.38~~ Demands: ~~1~~, ~~1~~, ~~4~~, 4



Delivery at t=2.38

Inter-arrival times: ~~0.02~~, ~~0.18~~, ~~0.18~~, ~~0.38~~ Demands: ~~1~~, ~~1~~, ~~4~~, ~~4~~