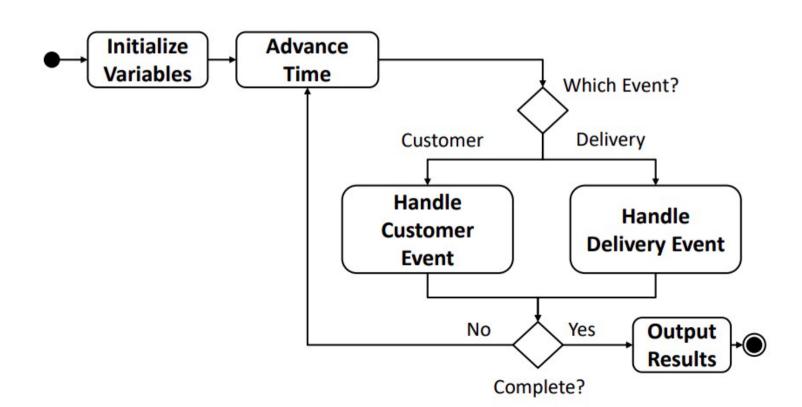
Computer Modeling and Simulation

Lecture 9

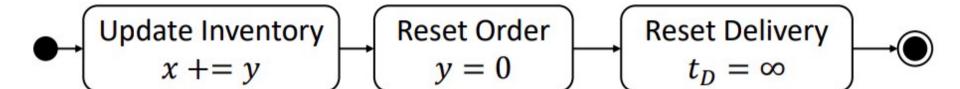
Inventory Model - An Example

- Stock products which sell for r = 100 each
- Customer inter-arrival time d~exponential $\lambda = 5$
- 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

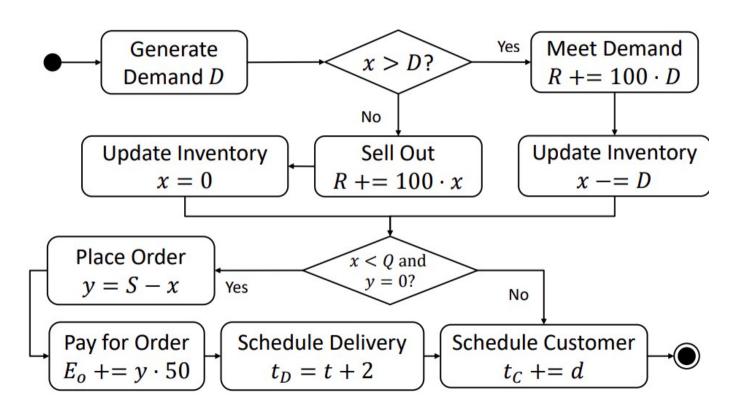
Activity Diagram



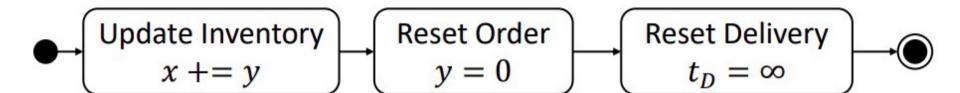
Advance Time



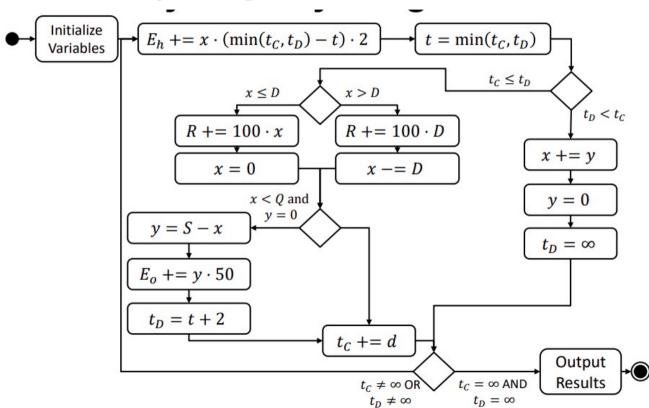
Customer Event



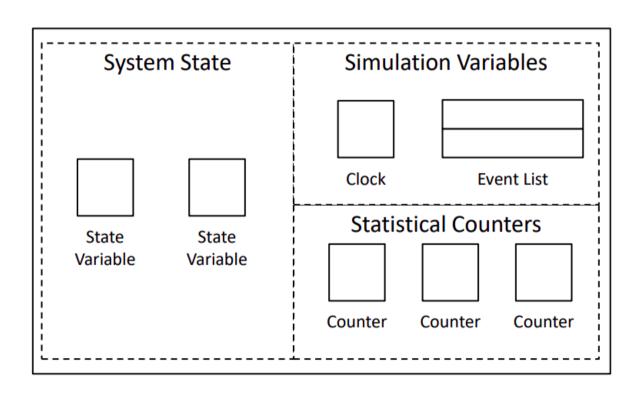
Delivery Event



Complete Activity Diagram

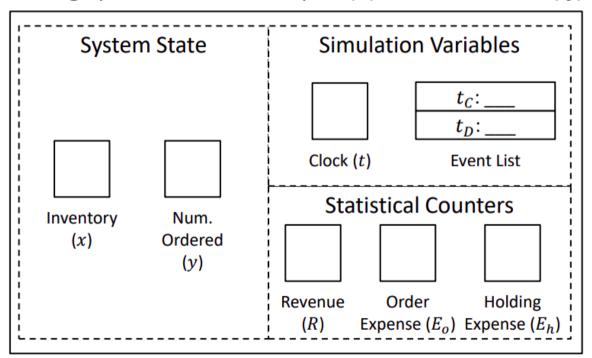


Inventory Model Structure



Inventory Model Structure

Design parameters: Order-up-to (S), Order threshold (Q)



Initialize Simulation

Inter-arrival times: 0.02, 0.18, 0.18, 0.38 Demands: 1, 1, 4, 4 System State Simulation Variables t_C : 0.02 0 t_D : ∞ Clock(t)**Event List** 20 0 **Statistical Counters** Inventory Num. (x)Ordered 0 0 (y)

Revenue

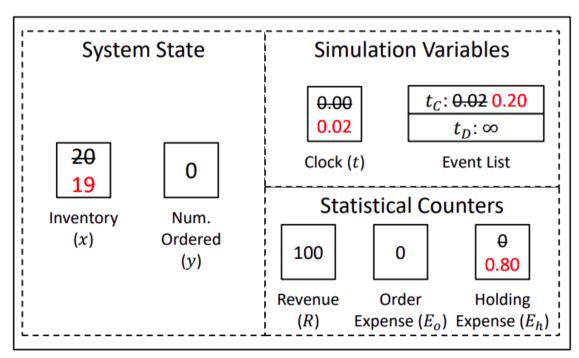
(R)

Order

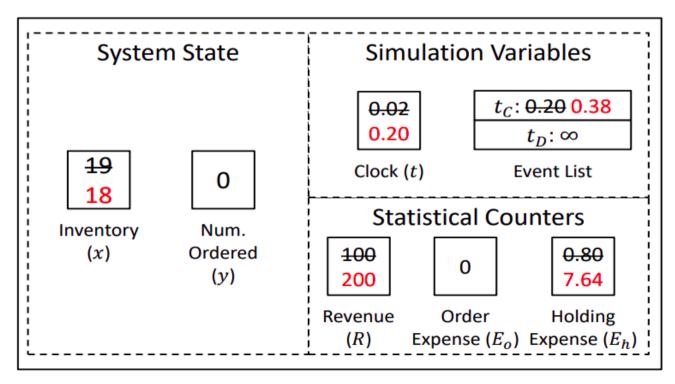
Holding

Expense (E_o) Expense (E_h)

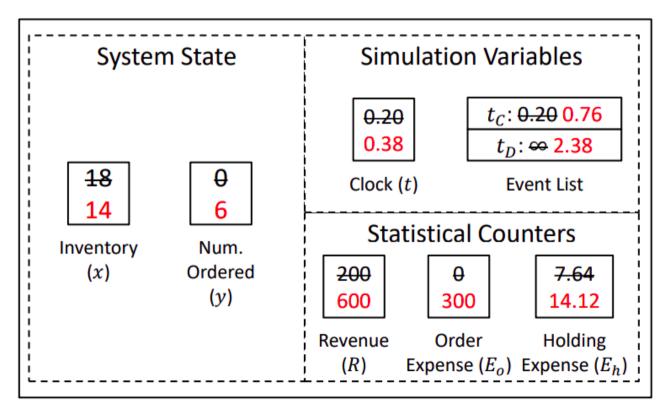
Customer @ t = 0.02



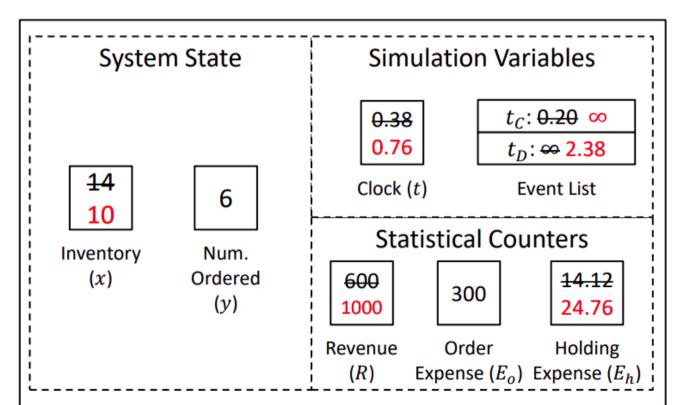
Customer @ t = 0. 20



Customer @ t = 0. 38



Customer at t=0.76



Delivery at t=2.38

