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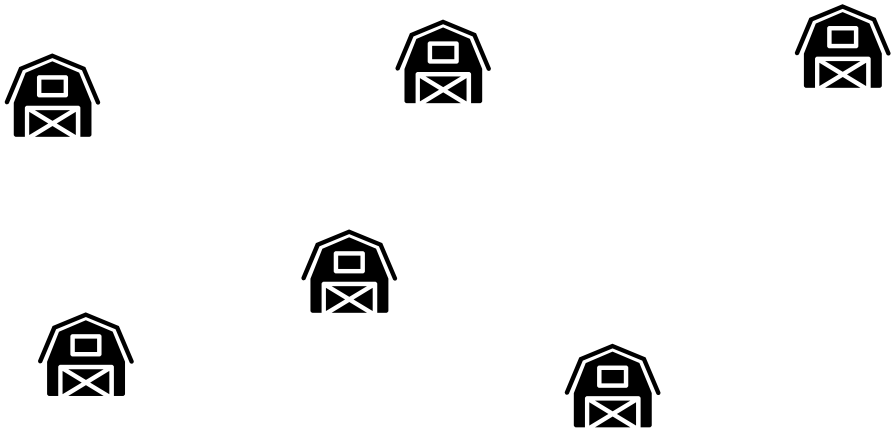
CENTER FOR OPTIMIZATION AND APPLIED PROBABILITY

Stochastic optimization for the purchasing inventory routing problem in agri-food supply chains

Ariel Rojas, Juan Betancourt,
Daniel Cuellar, Marlin Ulmer,
Camilo Gómez, David Álvarez Martínez

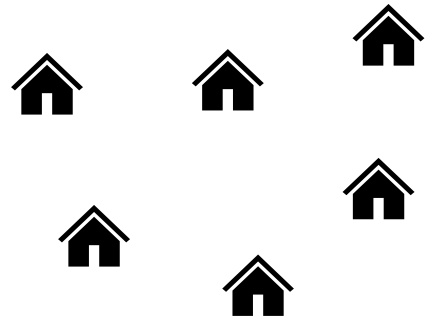
Decision Analytics Lab

Suppliers - Farmers



Warehouse

Customers



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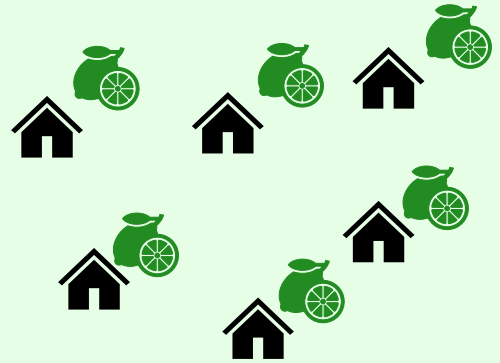

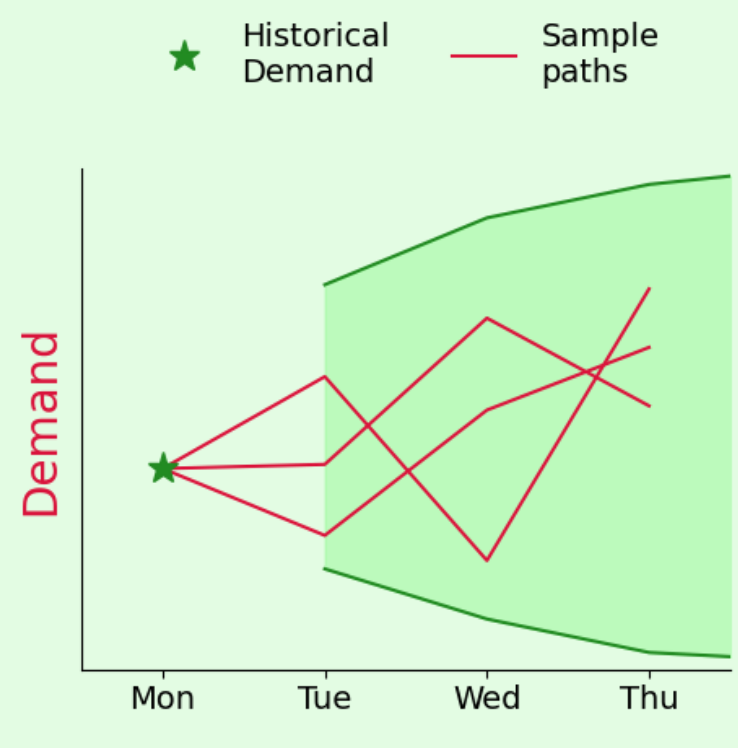

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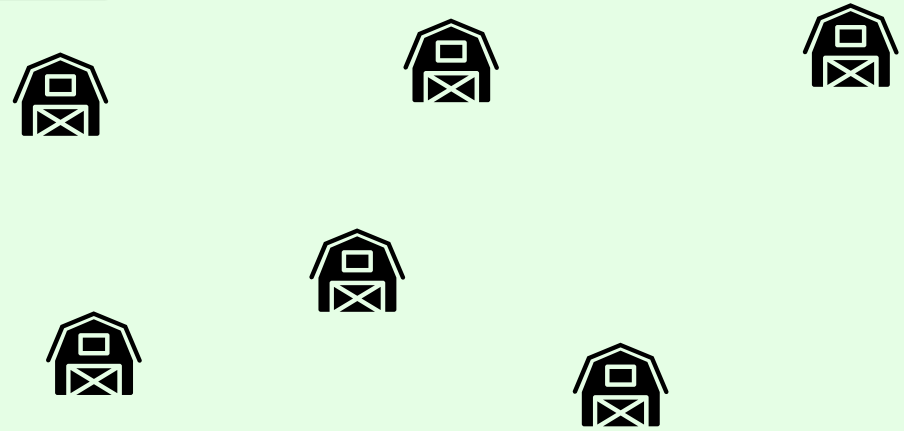
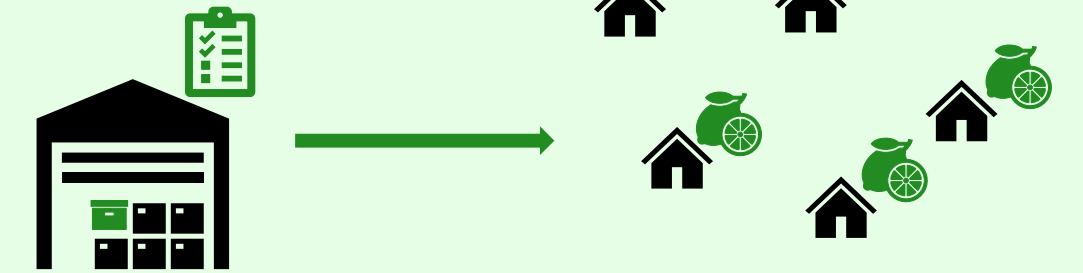
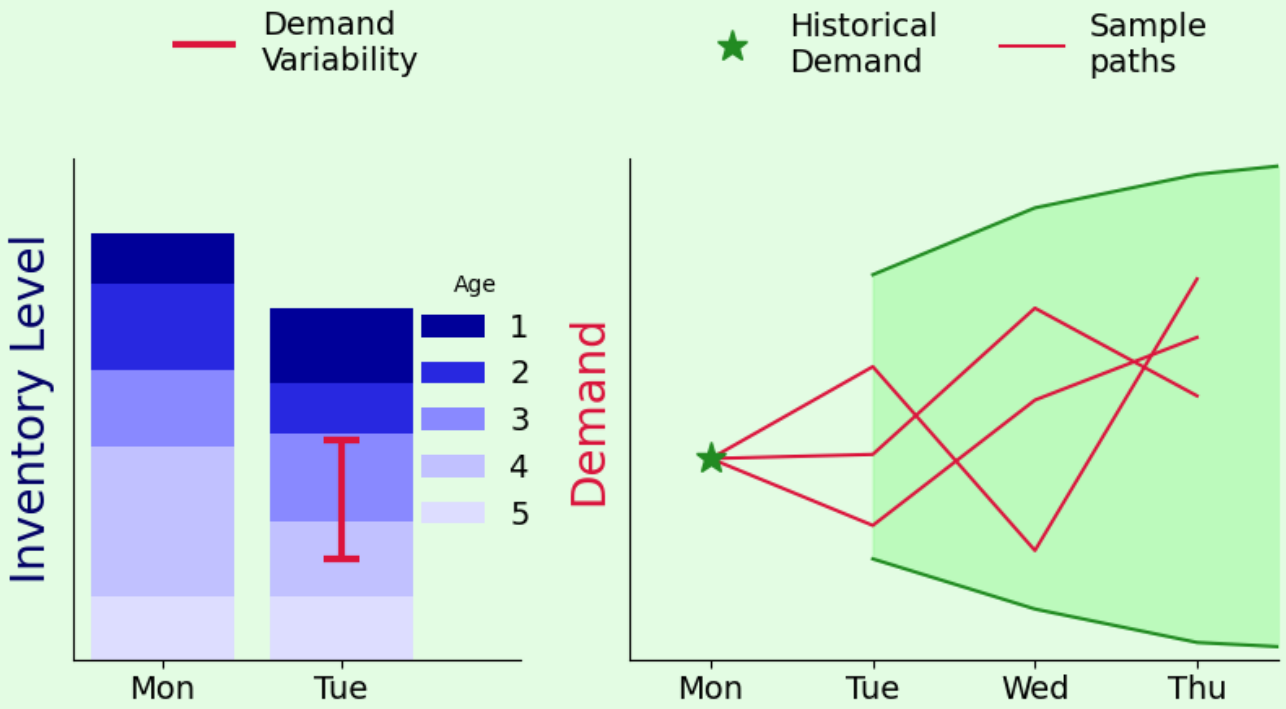
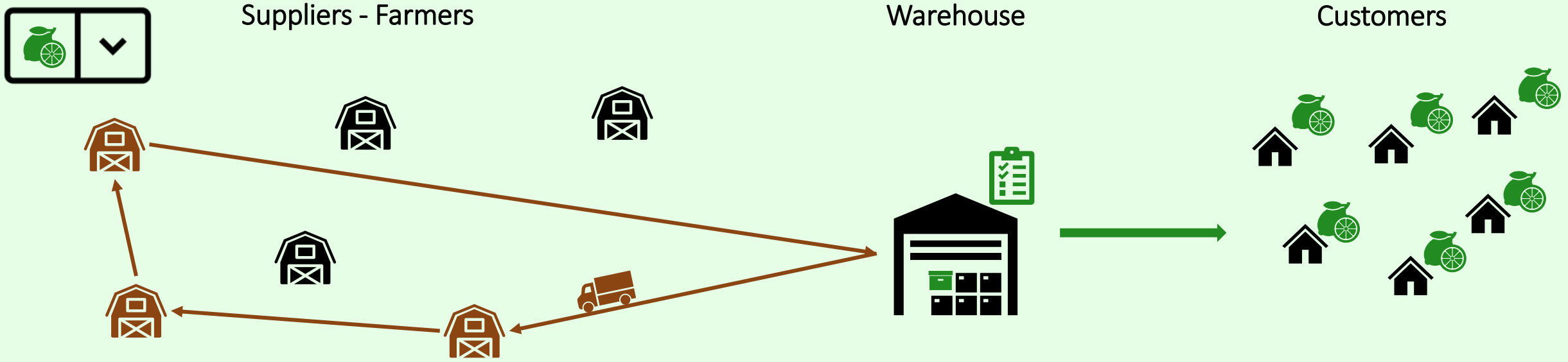
Warehouse

Customers





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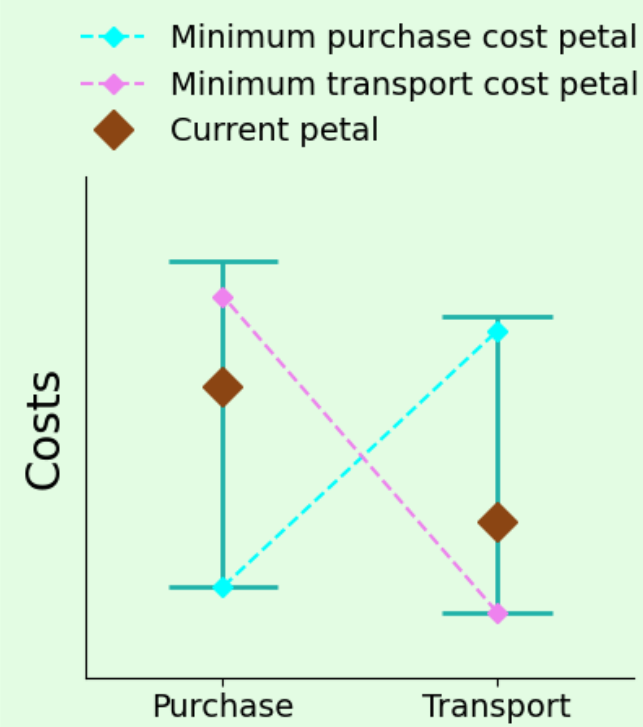
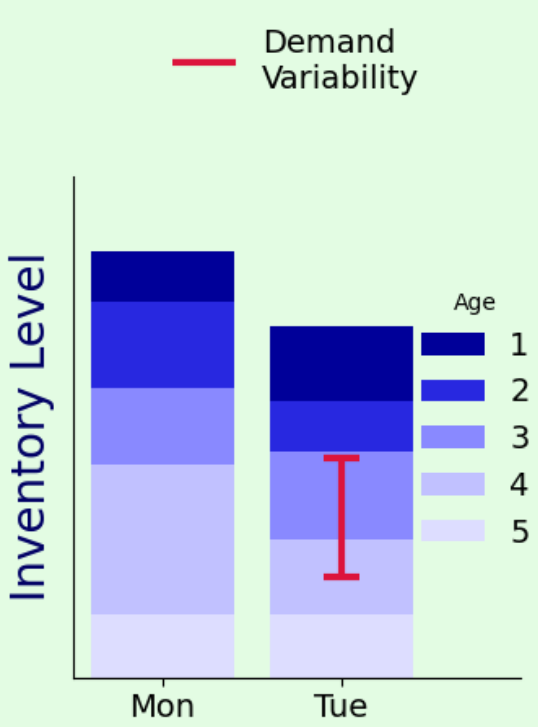
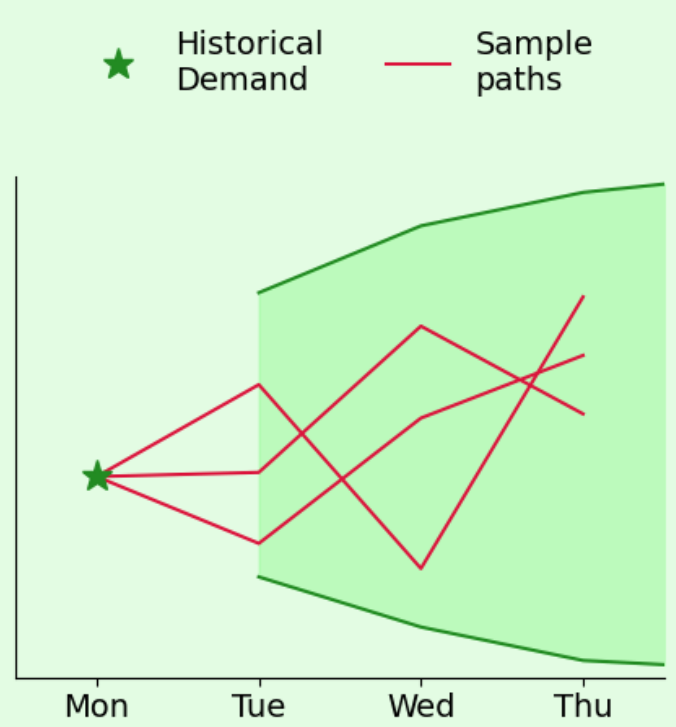
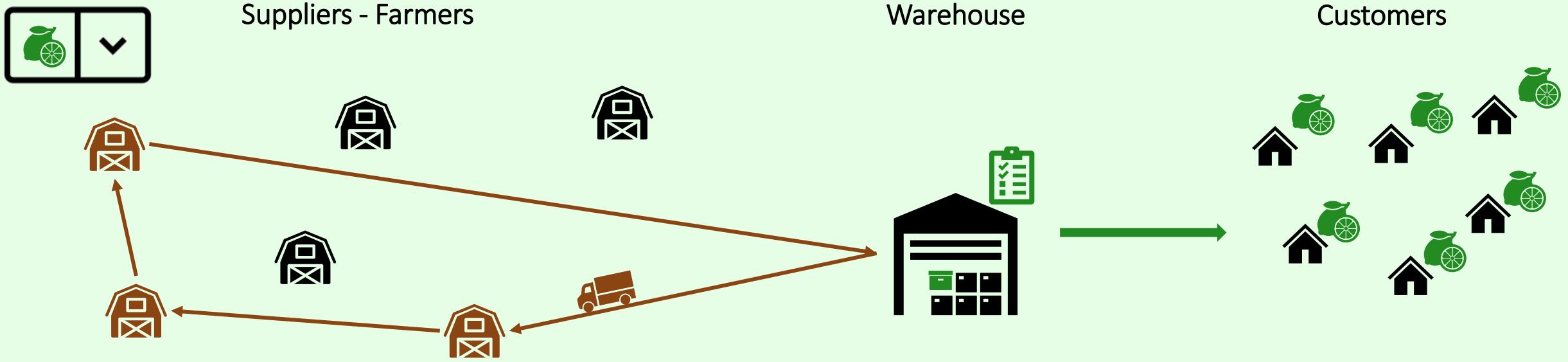
Warehouse
Customers

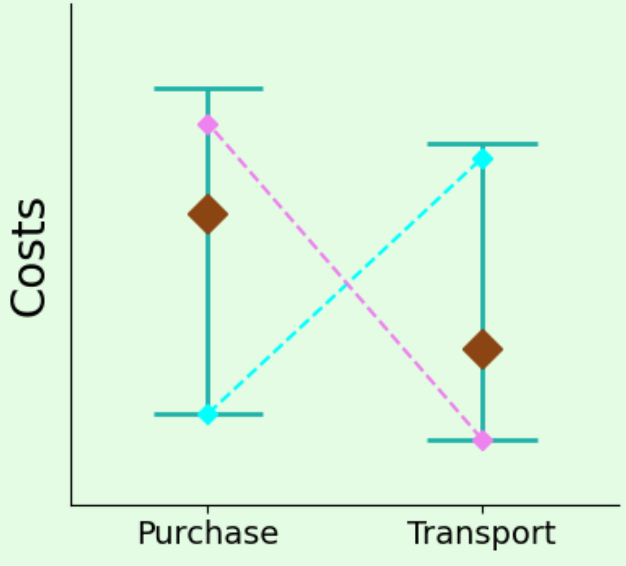

Minimum purchase cost petal
Minimum transport cost petal
Current petal
Costs
Purchase
Transport


Demand Variability
Inventory Level
Age
1
2
3
4
5
Mon
Tue


Historical Demand
Sample paths
Demand
Mon
Tue
Wed
Thu


Suppliers - Farmers
Warehouse
Customers


Expected Demand
Available Product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Minimum transport cost petal
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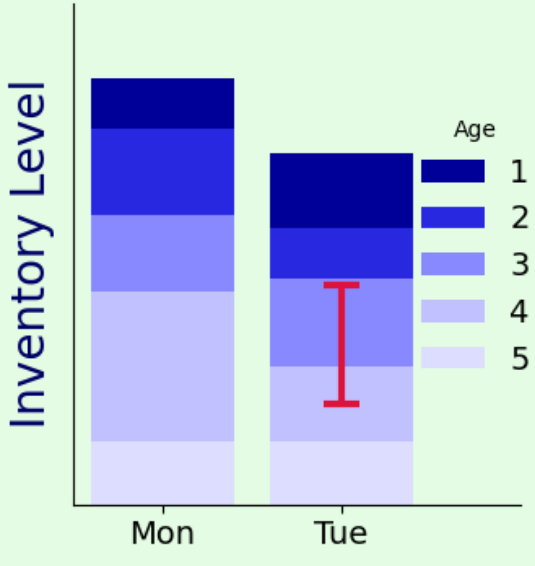
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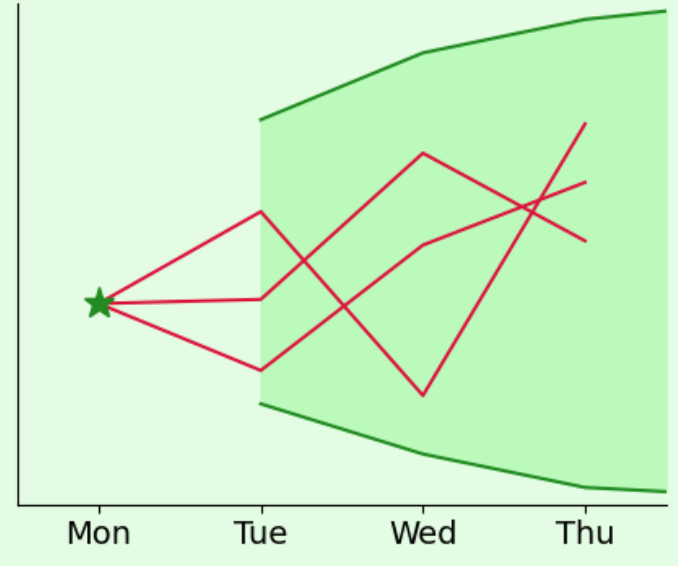
Historical Demand
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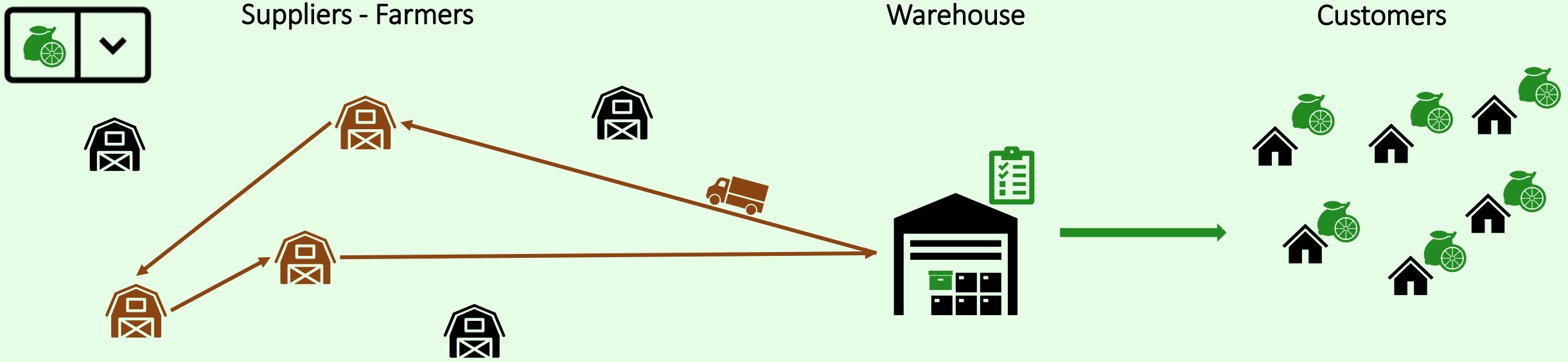
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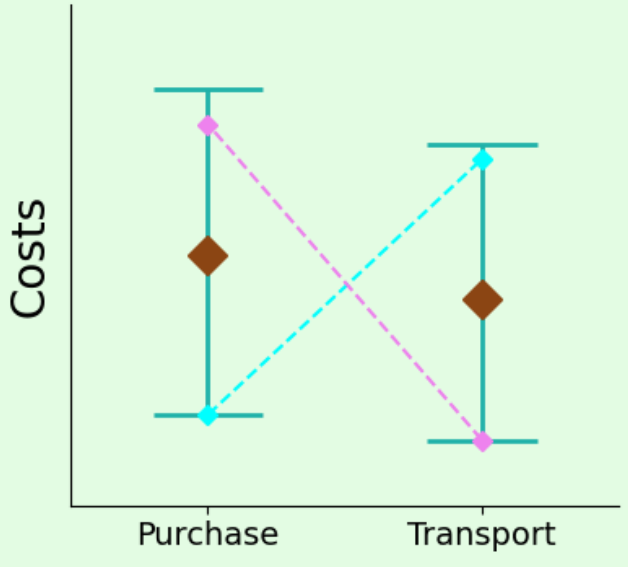
Expected Demand
Available Product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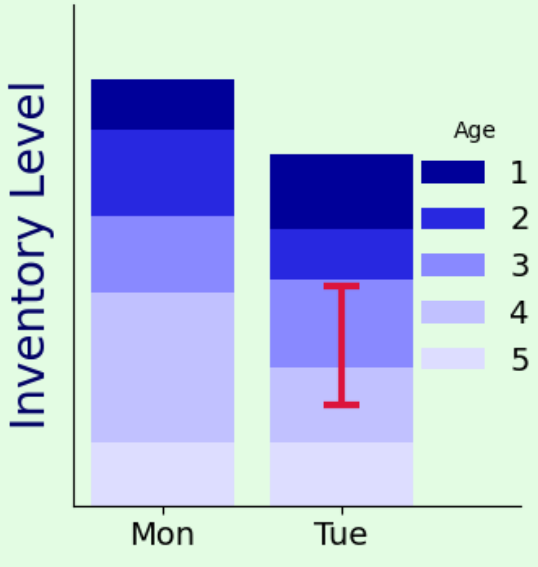
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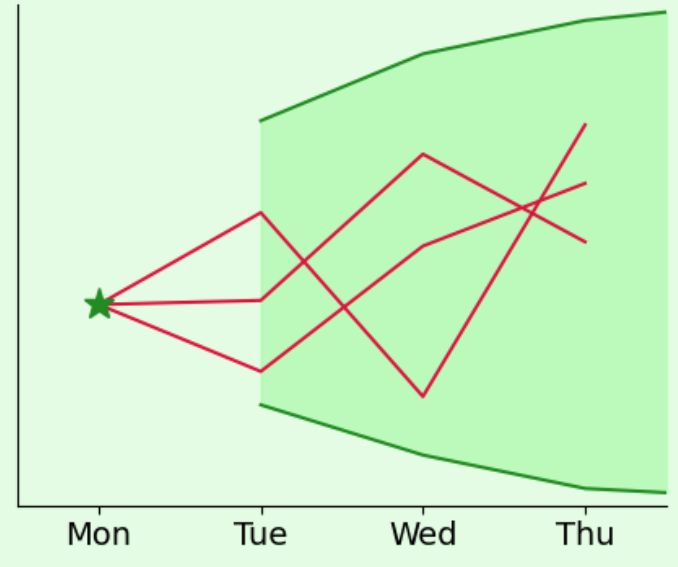
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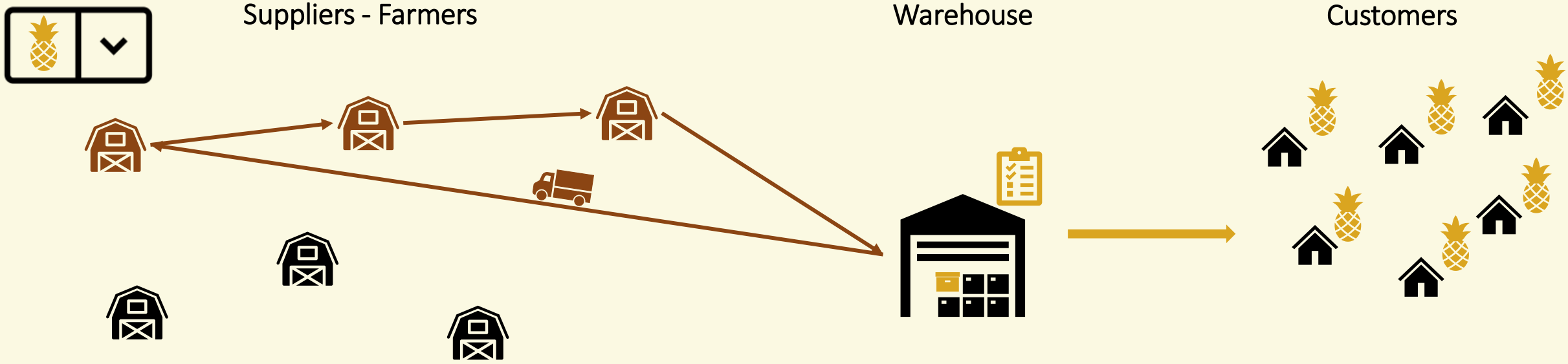
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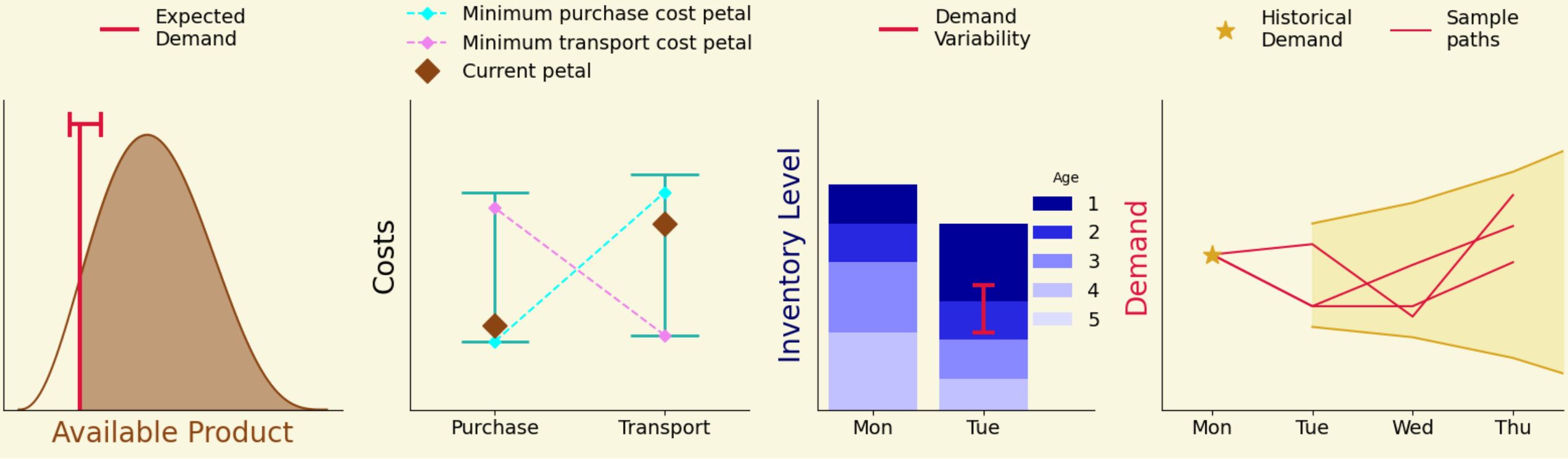
Expected Demand
Minimum purchase cost petal
Minimum transport cost petal
Current petal
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Sample paths
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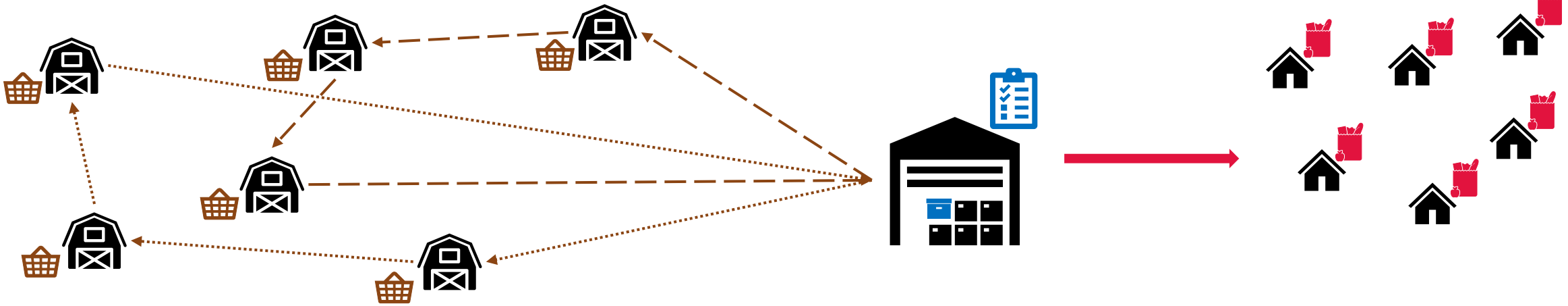
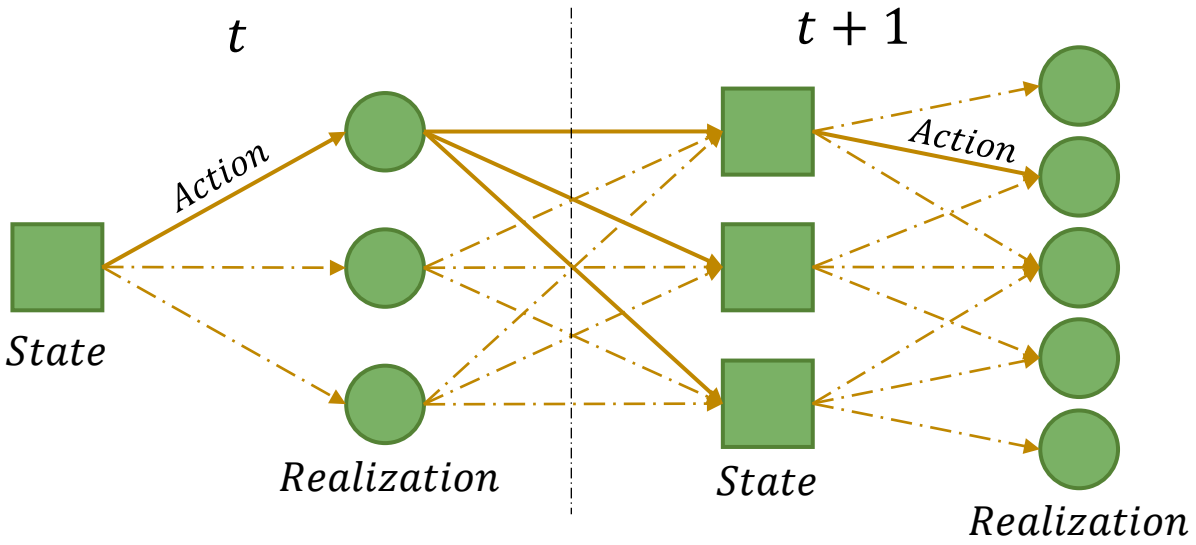
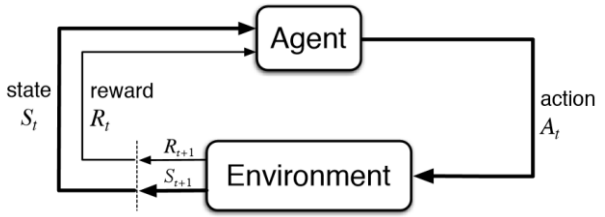
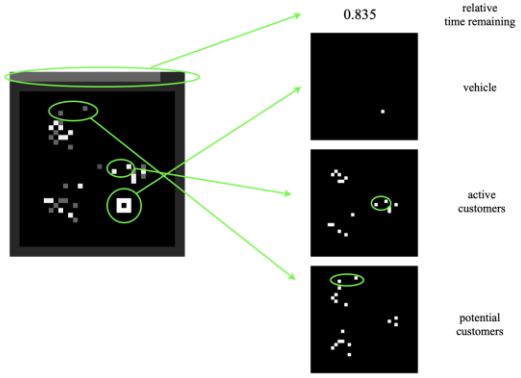
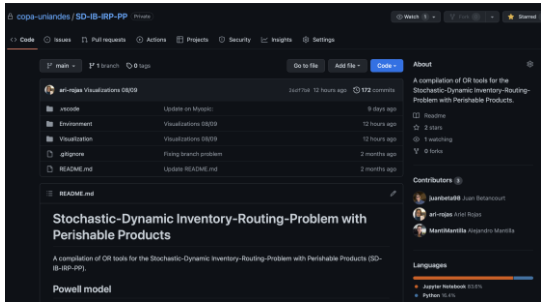






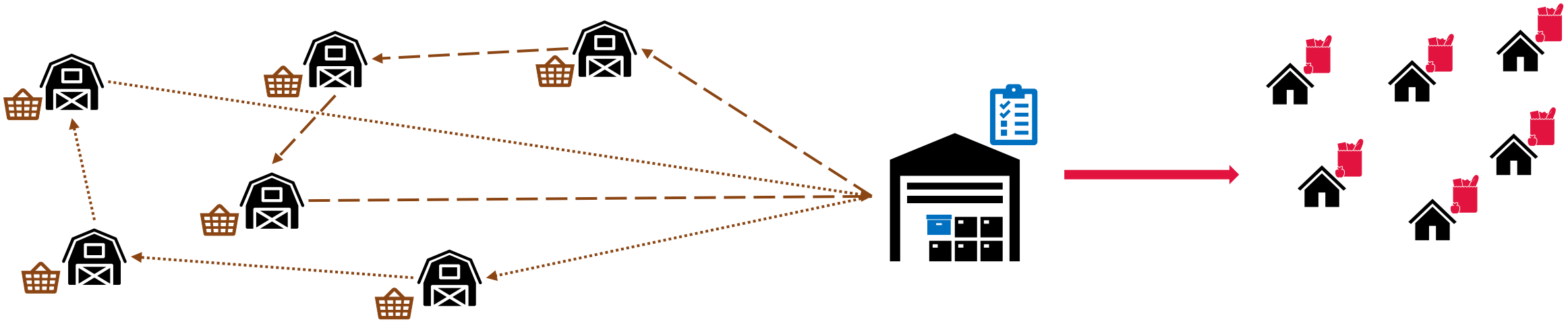




Suppliers - Farmers

Warehouse

Customers



Historical Data

Availabilities & prices

Stochastic Modeling (W_t)

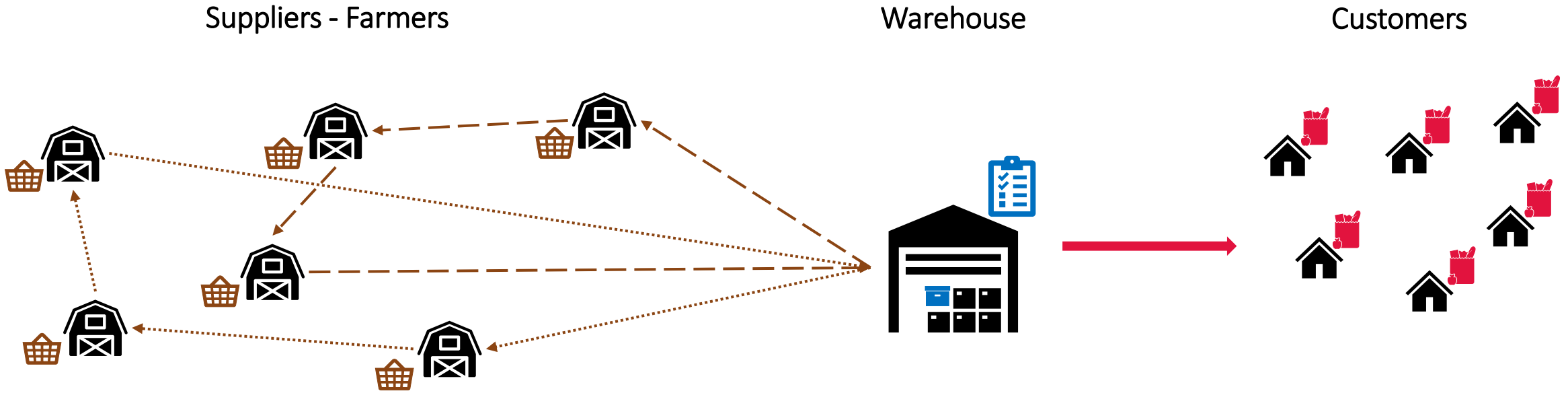
- Availability
- (Price and transportation)
- Demand
- Estimations

Historical Data

Demand

System Dynamics (S_t, S_X^M)

Inventory of perishable products, updated with the **purchasing and collection** of products throughout suppliers in response to the **demand**.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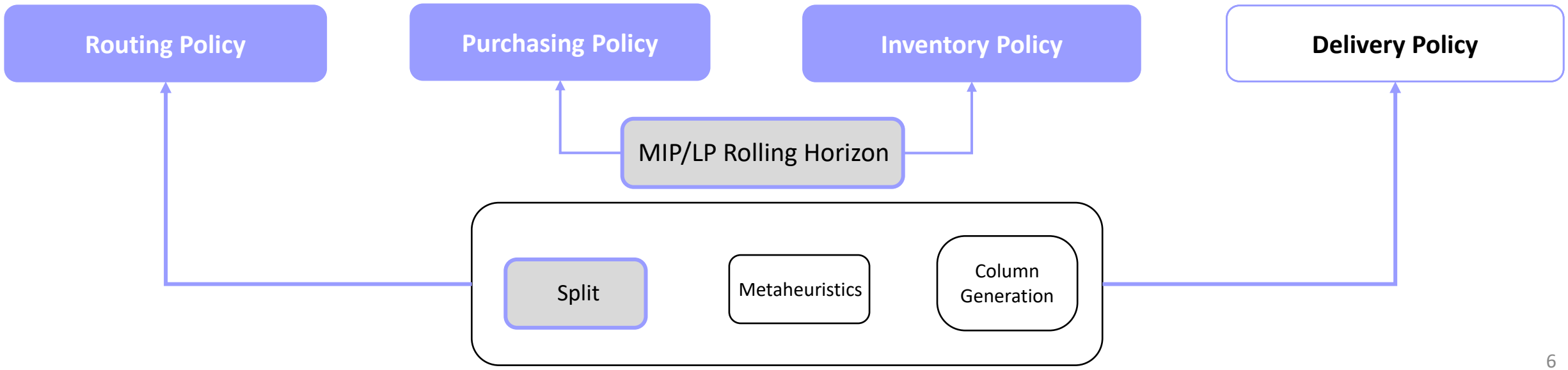
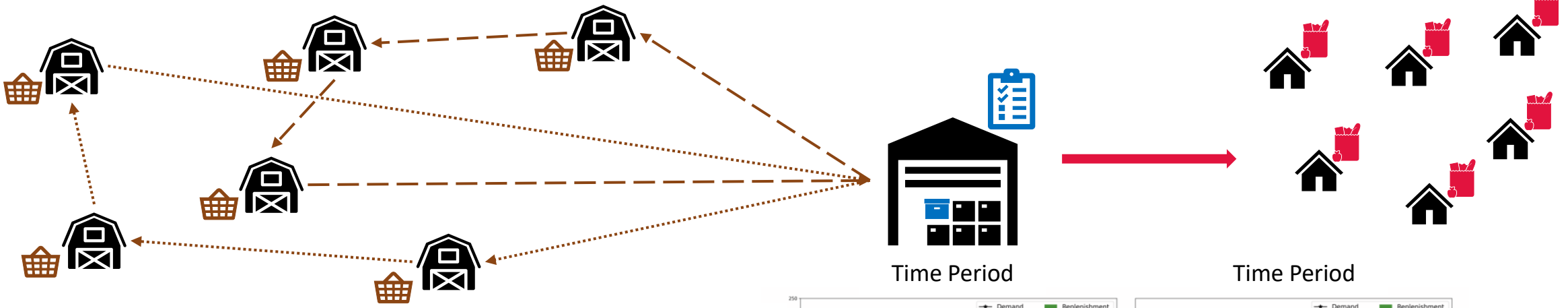
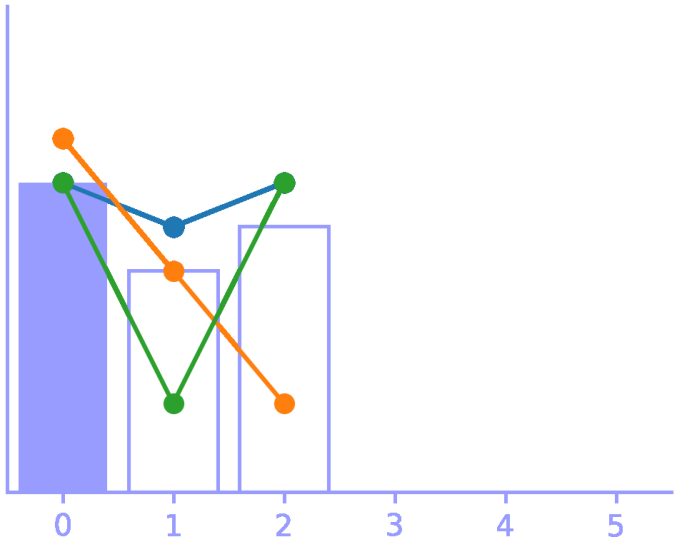

Routing Policy
Purchasing Policy
Inventory Policy
Delivery Policy
MIP/LP Rolling Horizon
Split
Metaheuristics
Column Generation

Suppliers - Farmers

Warehouse

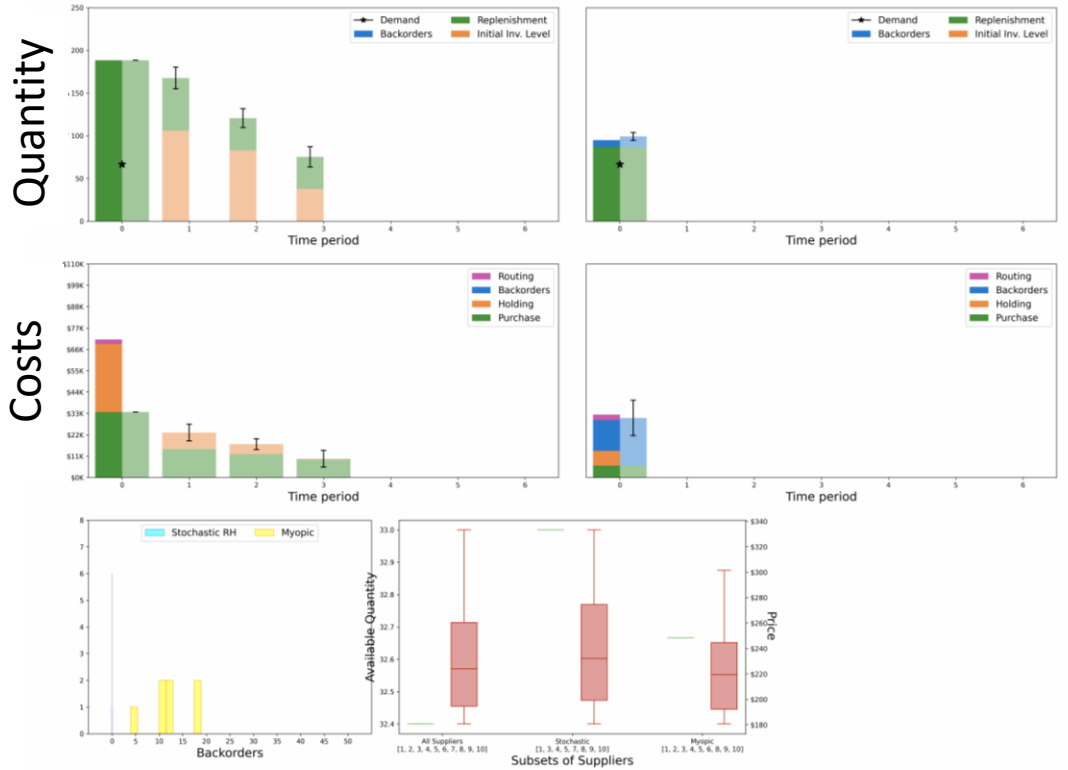
Customers





Time Period

Time Period



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Thank you

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