

## Simulator

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| <ul style="list-style-type: none"> <li>Displays the simulation, between the entities</li> </ul> | <ul style="list-style-type: none"> <li>Robot</li> <li>PackingStation</li> <li>StorageShelf</li> <li>ChargingPod</li> <li>Order</li> </ul> |
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## Interface

### Entity

Robot, StorageShelf, PackingStation, ChargingPod

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| <ul style="list-style-type: none"> <li>Generates each entities unique id</li> <li>Gets the unique id of each entity</li> <li>Compares the location of two entities</li> <li>Gets the location of each entity</li> </ul> | <ul style="list-style-type: none"> <li>Simulator</li> </ul> |
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### Robot

### Entity

CostEstimationStrategy, PathFindingStrategy

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| <ul style="list-style-type: none"> <li>Move up/down/left/right once on grid</li> <li>Takes items from current shelf</li> <li>Move under storage shelves, charging pods and packing stations</li> <li>Move under storage shelf</li> <li>Robots that collide cause a crash (Simulation will be stopped)</li> <li>When a robot moves one space, one power unit decreases (when not holding anything)</li> <li>When carrying something, two power unit decrease</li> <li>Return back to the charging pod when aren't able to reach destination</li> <li>Robot can decide if it accepts assignment or not</li> <li>Gets the battery level</li> <li>Drops order off at packing station</li> <li>Generates its own UID</li> <li>Outputs the UID</li> </ul> | <ul style="list-style-type: none"> <li>PackingStation</li> <li>ChargingPod</li> <li>StorageShelf</li> </ul> |
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StorageShelf		Entity
<ul style="list-style-type: none"> <li>Generates a unique identifier</li> <li>Outputs the unique identifier</li> <li>Compares its location with that of a robot</li> </ul>	<ul style="list-style-type: none"> <li>Robot</li> <li>PackingStation</li> <li>ChargingPod</li> </ul>	

PackingStation		Entity
<ul style="list-style-type: none"> <li>Receive next Order</li> <li>Check items of Order</li> <li>Dispatch Order</li> <li>Notify if Order is complete</li> <li>Notify if packing station is occupied</li> </ul>	<ul style="list-style-type: none"> <li>Robot</li> <li>ChargingPod</li> <li>StorageShelf</li> </ul>	

ChargingPod		Entity
<ul style="list-style-type: none"> <li>Charges the robot</li> <li>Determines the rate at which the robot charges</li> </ul>	<ul style="list-style-type: none"> <li>Robot</li> </ul>	

PathFindingStrategy		Robot
<ul style="list-style-type: none"> <li>Finds shortest route using A* algorithm</li> <li>Stops robots from crashing into each other</li> </ul>	<ul style="list-style-type: none"> <li>Robot</li> </ul>	

CostEstimationStrategy		Robot
<ul style="list-style-type: none"> <li>Finds the optimal cost effective route</li> <li>Uses A* search algorithm</li> </ul>	<ul style="list-style-type: none"> <li>Robot</li> </ul>	

<div>Order</div> <div>AssignedOrder, UnassignedOrder, CompletedOrder</div>	
<ul style="list-style-type: none"><li>• Display all the orders</li><li>• Divide orders into assigned, unassigned and completed</li></ul>	<ul style="list-style-type: none"><li>• Robot</li><li>• PackingStation</li><li>• StorageShelf</li></ul>

Abstract	AssignedOrder	Order
<ul style="list-style-type: none"><li>• Keeps a list of assigned orders.</li></ul>	<ul style="list-style-type: none"><li>• Order</li><li>• CompletedOrder</li><li>• UnassignedOrder</li></ul>	

UnassignedOrder		Order
<ul style="list-style-type: none"><li>• Keeps a list of unassigned orders.</li><li>• Displays unassigned orders.</li></ul>	<ul style="list-style-type: none"><li>• Order</li><li>• AssignedOrder</li><li>• CompletedOrder</li></ul>	

CompletedOrder		Order
<ul style="list-style-type: none"><li>• Keeps a list of completed orders.</li><li>• Displays completed orders.</li></ul>	<ul style="list-style-type: none"><li>• Order</li><li>• AssignedOrder</li><li>• UnassignedOrder</li></ul>	