**Order Preparation process**

Stages (4):

1. Received
2. Preparing
3. Packaging
4. Delivery

Process flow:

Received (T0) => Preparing (T1) => Packaging (T2) => Delivery (T1 + T2 + T3)

Why will we do this simulation?

1. To know avg time to make order
2. Number of chiefs in the restaurant (Resources)
3. …

It will be a trail simulation (n) and each trail What will happen?

**1. Received (Order Entry)**

* **What Happens**:
  + A new order enters the system.
  + It’s added to the received\_queue.
  + A timer starts for this order.
* **Time Spent**:
  + Example: 2 minutes (adjustable). # can be random or constant
* **Next Step**:
  + After 2 minutes, the order moves to **Preparing**.

**2. Preparing (Items Being Prepared)**

* **What Happens**:
  + The order is now being assembled (e.g., ingredients gathered, cooked, etc.).
  + It sits in the preparing\_queue.
* **Time Spent**:
  + Example: 5 minutes. # can be ran or con
* **Next Step**:
  + After 5 minutes, it moves to **Packaging**.

**3. Packaging (Order Packed)**

* **What Happens**:
  + The order is packed (e.g., wrapped, labeled, boxed).
  + It waits in the packaging\_queue.
* **Time Spent**:
  + Example: 3 minutes.
* **Next Step**:
  + After 3 minutes, it moves to **Delivery**.

**4. Delivery (Order Handed Over)**

* **What Happens**:
  + The order is marked as "delivered."
  + Total time (from Received to Delivery) is calculated.
  + Example: 10 minutes total (2 + 5 + 3).
* **Final Step**:
  + Order exits the system (removed from queues).

**Key Rules**:

1. Each stage has a **fixed time** (customizable).
2. Orders move **one by one** (First-In-First-Out).
3. The system **tracks time automatically** at each step.

**Queues**:

received\_queue = []

preparing\_queue = []

packaging\_queue = []

delivery\_queue = []

**Order Tracking:**

order\_timers = {} # Format: {order\_id: {"start": time, "end": time}}

Example of Output in Each Trail

[12:00] Order1: Received → Preparing

[12:05] Order1: Preparing → Packaging

[12:10] Order1: Packaging → Delivery

[12:15] Order1: Delivered! Total Time: 15 minutes. -> important for me calc the avg at 1 trail

In all trail give me one output :

Avg time if number of chiefs constant

Avg time for Chiefs if variable (To know the best number of chiefs )

In the end draw the result (-----)