Background

You are tasked with planning and programming the control of a Robotic Cell for palletizing application at a warehouse.

A robotic arm operates inside a secure cell, stacking boxes on pallets. The cell has doors to allow human access, a stack-light to indicate system status, and a touchscreen HMI for workers.

Communication with the Warehouse Management System (WMS) is done via API calls.

You will simulate this cell in software - no real robot is required.

Tasks

1. API Call Handler

Warehouse Management System (WMS) sends palletizing requests to the Robotic Cell.

```
Request format:
```

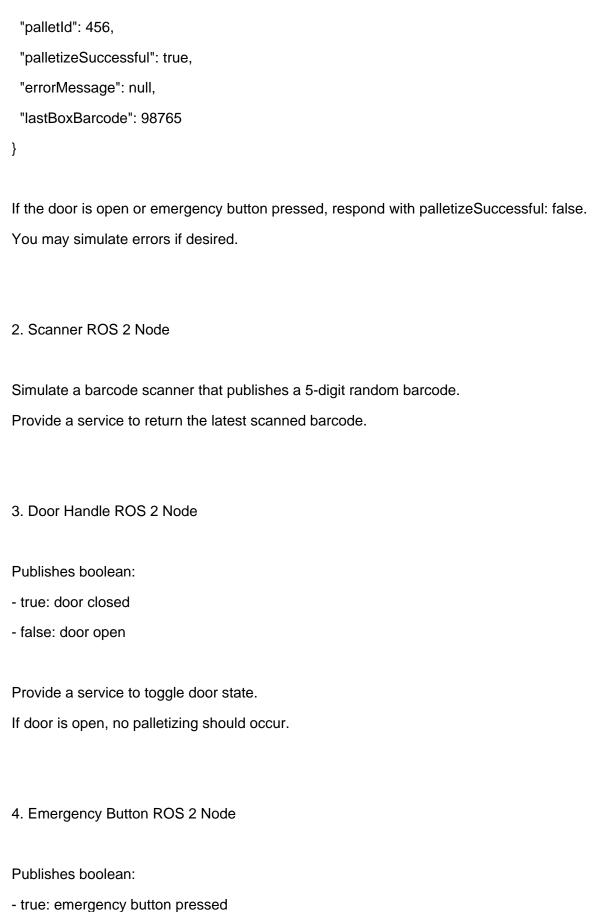
```
HTTP POST http://<ip>:8080/palletize
```

```
{
    "palletId": 456,
    "boxCount": 10
}
```

The Robotic Cell responds after processing the request:

```
HTTP POST http://<ip>:8081/confirmPalletize
```

```
{
```



- false: normal

Provide two services:
- Press emergency button
- Reset emergency button
When pressed, palletizing must stop.
5 0/ 11:1/ DOO 0 N 1
5. Stack-Light ROS 2 Node
Publishes int state:
- 0: operational (door closed, no emergency, ready to palletize)
- 1: paused (door open)
1: emergency
6. HMI
Implement a simple real time HMI (HTMI /Peast Ot Tkinter, your shoise)
Implement a simple real-time HMI (HTML/React, Qt, Tkinter your choice) Display:
- Current palletize request (palletId, boxCount)
- Response status
- Emergency button state
- Door state
- Stack-light indicator:
- 0: green
- 1: yellow
1: red

Requirements

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- Submit full project as ZIP
- Include Git version control + README (dependencies, install, run instructions)
- Provide screen-recorded video demo (no face, no private data)
- Mention any open-source code used
- Use ROS2 Humble if possible
- Docker support is optional
- If unclear decisions arise, document them in README