Implement an Embassy Consulate Line System

Problem Scenario and Context

You are tasked with designing a solution for an Embassy Consulate Service system that processes visa applications. There are four types of visas offered:

1. Tourist Visa (TR)
2. Medical Visa (MED)
3. Business Visa (BS)
4. Government Officials Visa (GO)

Requirements

➢ **Daily Applicant Limit**

A maximum of 25 applicants per visa type can receive service daily, making a total of 100 applicants per day combing all the visa types.

➢ **Token Assignment**:

Tokens are issued sequentially across all categories (e.g., TR-1, BS- 2, MED-3) starting at 1 and incrementing globally, regardless of the Visa category. (See the sample output section named issuing tokens for more details)

➢ **Counter Management**

In the Embassy total 4 counters are available. Counters are primarily designated to each visa type:

- Counter 1: TR (Tourist Visa)
- Counter 2: for MED (Medical)
- Counter 3: for BS (Business)
- Counter 4: for GO (Government Officials)

If a counter has less than 25 applicants for its primary visa type on a given day, it can serve applicants from the longest-remaining line of other visa types to optimize the service.

➢ **Calling Customers**
   • Customers are served in the order of their tokens, ensuring fairness.
   • If multiple lines are eligible for serving at a counter, priority is given to the longest line.

Day Summary Report (Bonus Task)

A new functionality should be implemented which will generate summary report of the total applicants served by each counter at the end of the day. The summary must include

   • Total applicants served per visa type.
   • Applicants served by each counter (primary and reallocated categories).
   • Number of idle counters of the day (if any).

Sample Execution and Outputs

Issuing Tokens

Input: Request token for 'Tourist Visa'

Output: Your token is: TR-1

Input: Request token for 'Medical Visa'

Output: Your token is: MED-2

Input: Request token for 'Business Visa'

Output: Your token is: BS-3

Input: Request token for 'Tourist Visa'

Output: Your token is: TR-4

Input: Request token for 'Government Officials Visa'

Output: Your token is: GO-5

Input: Request token for 'Business Visa'

Output: Your token is: BS-6

Input: Request token for 'Medical Visa'

Output: Your token is: MED-7

Input: Request token for 'Government Officials Visa'

Output: Your token is: GO-8

Input: Request token for 'Tourist Visa'

Output: Your token is: TR-9

Input: Request token for 'Business Visa'

Output: Your token is: BS-10

Counter Availability (Day summary)

Tourist (TR): 10 applicants

Medical (MED): 15 applicants

Business (BS): 25 applicants

Government Officials (GO): 10 applicants

Calling the Next Customer

Counter 1 (Tourist Visa)

User Input: Call next customer

Output: Counter 1, Please serve the token number "TR-1"

Once all the 10 TR visa customers are served, after that if the user gives input

User Input: Call next customer

Output: Counter 1, Please serve the token number "BS-26"

Counter 2 (Medical Visa)

User Input: Call next customer

Output: Counter 2, Please serve the token number "MED-2"

Once all 15 MED visa customers are served, after that if the user gives input

User Input: Call next customer

Output: Counter 2, Please serve the token number "BS-27"

Counter 3 (Business Visa)

User Input: Call next customer

Output: Counter 3, Please serve the token number "BS-3"

Once all 25 BS visa customers are served, this counter becomes idle.

Counter 4 (Government Officials Visa)

User Input: Call next customer

Output: Counter 4, Please serve the token number "GO-4"

Once all 10 GO visa customers are served, after that if the user gives input

User Input: Call next customer

Output: Counter 4, Please serve the token number "MED-16"

Daily Summary Report (Bonus Task)

1. Applicants served by Visa Type

- TR (Tourist): 10
- MED (Medical): 15
- BS (Business): 25
- GO (Government Officials): 10

2. Applicants served by Counter

- Counter 1 (TR): TR: 10, BS: 5
- Counter 2 (MED): MED: 15, BS: 5
- Counter 3 (BS): BS: 15
- Counter 4 (GO): GO: 10, MED: 5

3. Idle Counter

- BS (Business)

Total Applicants Served: Example (60/70/80)