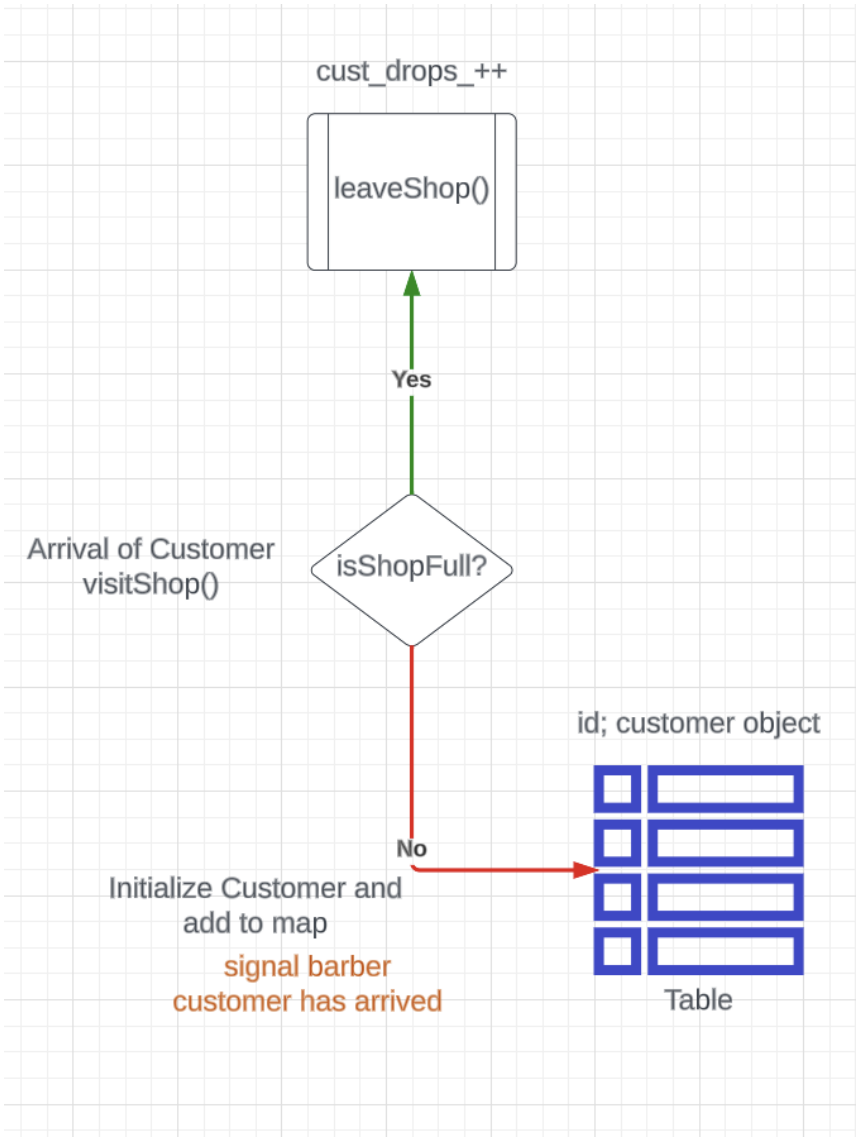
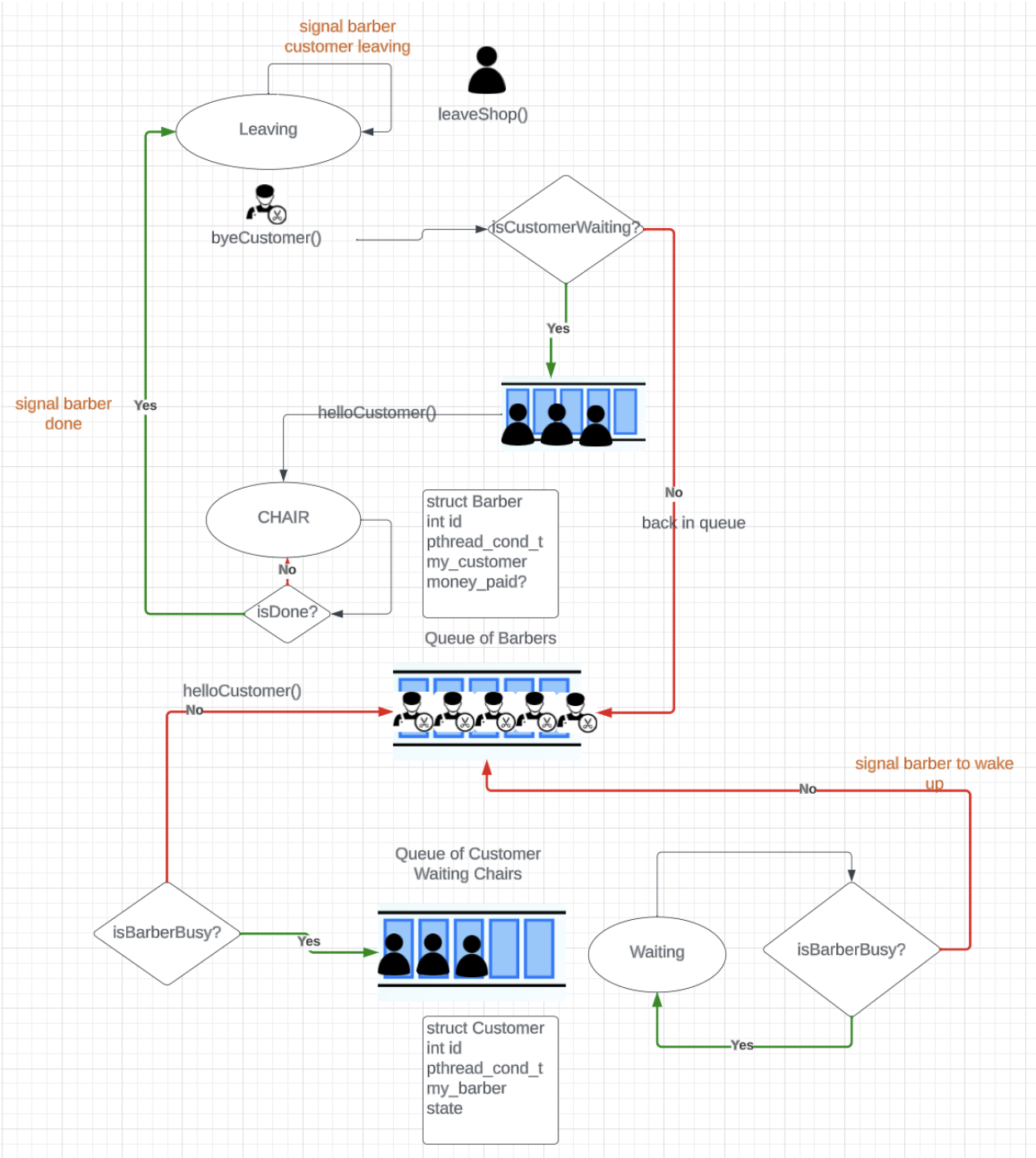
Documentation

Flow of Execution





Additional Use of Data Structures

Customer States: WAITING, CHAIR, LEAVING

- Represents the current status of each customer within the shop.
- When a customer arrives, their state is updated in the customer's mapping, possibly to a waiting (WAIR) or in-service (CHAIR) state.

- Upon completion, the customer's state is updated (LEAVING), and the barber's status is set to available for the next customer.

customers Mapping

- A key map used to keep track of customer-specific information.
- Maps customer IDs to their respective states or other relevant data.
- Facilitates easy lookup and update of customer status throughout the simulation.
- Mapping is accessed and modified during various customer-related operations, such as arrival, service initiation, and departure.

barbers Array

- Stores information about each barber in the shop.
- Represents each barber with a unique identifier and possibly their state (e.g., available, busy).
- Have condition variables (synchronization primitives) to each barber
- Used when assigning customers to barbers.
- Barbers interact with their respective condition variables for synchronization (e.g., waiting for a customer, signaling completion of service).

Discussion

Step 5: Approximately how many waiting chairs would be necessary for all 200 customers to be served by 1 barber?

My shop needs around 135 waiting chairs for 200 customers to be served by 1 barber.

Step 6: Approximately how many barbers would be necessary for all 200 customers to be served without waiting?

My shop, which has no chair, needs around 24 barbers for 200 customers to be served without waiting/leaving

Program Constraints:

Lack of Prioritization
This is a program limitation since the program doesn't have the ability to prioritize customers and their service time. Future implementation can include Shortest Job First to improve waiting time.

Lack of Real-world Scenario:

In a real-world scenario, customers won’t arrive all at the same time. This is a program limitation because it doesn’t fully simulate a barber shop. Future implementation can include more realistic customer behavior patterns, such as arrival time and service duration needed.