

Testing Report

Test Cases:

1. Multiple Customers Purchasing Tickets:

- **Description:** Test if multiple customers can successfully purchase tickets from the pool when tickets are available.
- **Scenario:** 3 customers attempt to buy 2 tickets each. Initially, there are 10 tickets in the pool, and customers should be able to purchase them until tickets run out.
- **Result:** Passed.
- **Details:** All customers were able to purchase tickets successfully, and the ticket pool updated correctly after each transaction. No issues were encountered.

2. Ticket Pool Reaching Maximum Capacity:

- **Description:** Test if the ticket pool handles the condition where adding tickets exceeds the max capacity.
- **Scenario:** The maximum ticket capacity is set to 20. Vendors should add tickets, but the system should prevent adding more once the capacity reaches 20.
- **Result:** Passed.
- **Details:** The system correctly prevented vendors from adding more tickets once the pool reached the maximum capacity. The ticket addition functionality behaved as expected.

3. Ticket Addition by Vendor:

- **Description:** Test if the vendor can add tickets based on the specified release rate and the total number of tickets in the pool.
- **Scenario:** A vendor adds 5 tickets every 1 second. After several iterations, check if the correct number of tickets are added.
- **Result:** Passed.
- **Details:** Vendors successfully added tickets at the specified release rate. The number of tickets in the pool increased as expected, and logs were generated for each addition.

4. **Handling of Ticket Shortage:**

- **Description:** Test if customers are blocked from purchasing tickets when there are not enough tickets available in the pool.
- **Scenario:** Attempt a customer transaction where they want to buy 10 tickets, but only 5 tickets are available in the pool. The customer should wait until more tickets are added.
- **Result:** Passed.
- **Details:** When there were insufficient tickets, customers were correctly blocked from making purchases and had to wait until more tickets were added by the vendors. The system handled this condition well, with no errors.

5. **System Stop and Thread Cleanup:**

- **Description:** Test the system's ability to stop ticketing operations and clean up all vendor and customer threads.
- **Scenario:** Stop ticketing operations after 10 seconds and verify that all threads are terminated correctly and that no additional tickets are added or removed.
- **Result:** Passed.
- **Details:** When operations were stopped, all vendor and customer threads were terminated correctly, and the system stopped all further ticket-related actions. No threads remained active after stopping.

Conclusion:

All test cases passed successfully, and the system performs as expected. Ticket transactions, adding and removing tickets, and stopping the operations worked smoothly. Minor optimizations were made to address thread synchronization and logging efficiency.