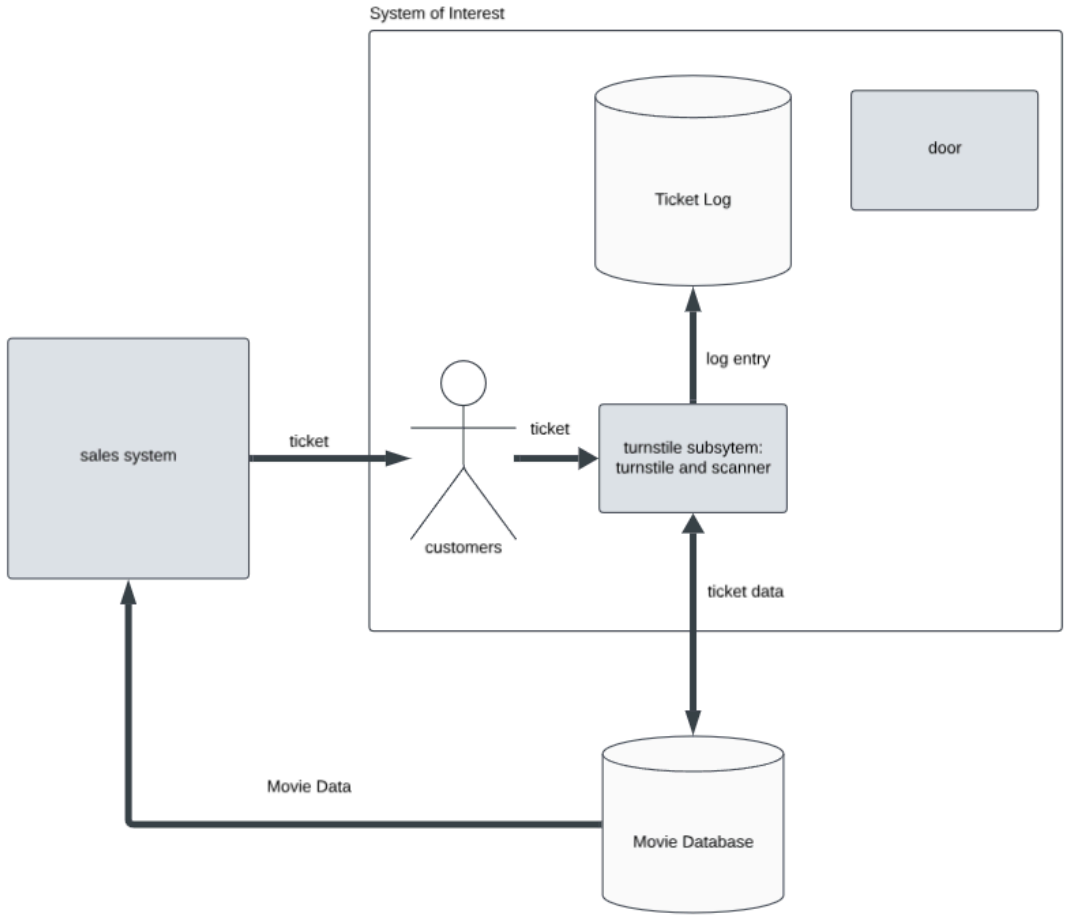
1. System of Interest

The System of Interest for this project is a turnstile system at a movie theater, designed to manage entry and enhance operational efficiency. The System of Interest consists of three subsystems which include the Access Control Subsystem, the Data Management Subsystem, and the User Interaction Subsystem. The Access Control Subsystem verifies ticket validity and triggers the turnstile to allow entry based on integration with the theater's central ticketing system.

This involves the use of a QR scanner upon entry into the turnstile. The Data Management Subsystem serves as the database for the turnstile, storing records of each entry, timestamp, and ticket type, and integrates with the theater's main database to validate tickets in real time. The User Interaction Subsystem enables customers to scan mobile or physical tickets and allows staff to remotely control the turnstile for special cases, like maintenance or emergencies, through an authorized application interface. Together, these subsystems ensure secure and efficient access for theater customers.

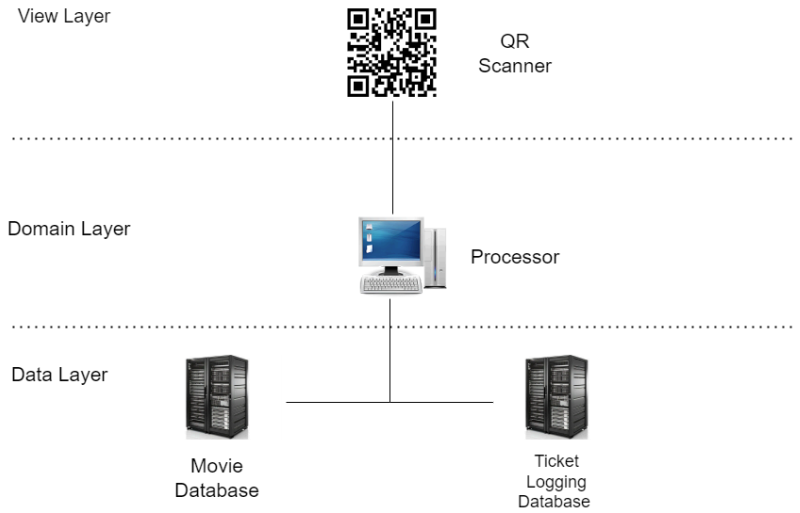


2. Describe the Environment

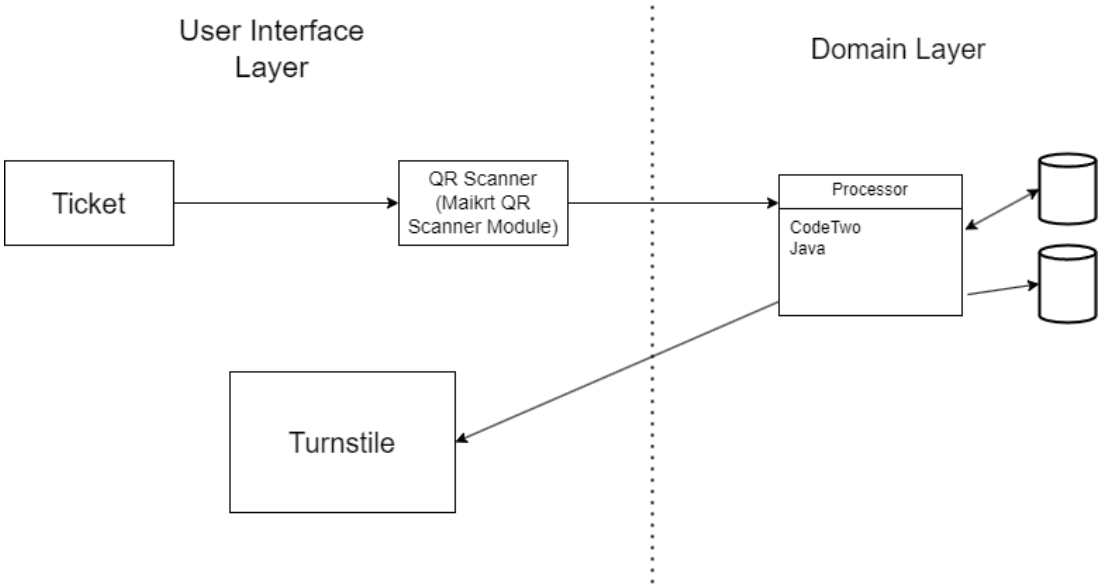
In the environment of the system, a customer would go about purchasing a ticket through two means, the online app and website or the in-person ticket sales person. The ticket will be printed with a QR code on it, as well as the other ticket attributes produced normally. After purchasing a ticket(s), the customer can either scan the ticket on the QR scanner in the turnstile or end up not using the ticket. If the customer scans the ticket on the QR scanner, the scanner will send ticket data to the movie database for the count of ticket use and active persons in a theater. The scan will also log the entry for that specific ticket(s) and not allow that ticket to be scanned in anymore, as only one person can use a ticket.

Next, the customer can either walk through the turnstile and push through the circle or pull it, in which case nothing would happen as turnstiles only move counter-clockwise. Once the customer has scanned the ticket(s) and walked through, the database will remove that ticket from itself, as it has been used and doesn't exist anymore, and the turnstile and QR scanner will reset themselves to the waiting stage for the next scan. The door on the side of the turnstile will act as an exit point for the movie theaters and also be used as an entrance for handicapped patrons or another entrance if needed. The inside of the door will have a simple push-to-open piece attached to it so anybody is able to open the door. On the outside, there will be a small validation scanner on the door for employee ids so the employees don't have to go through the turnstile every time they wish to get to the back. Since the employees also need to have a location for trash boats to enter and exit, this door will also serve as that as well. The very last thing that happens in the system's environment is the movie database logging another purchased ticket for a certain movie and logging it into the system.

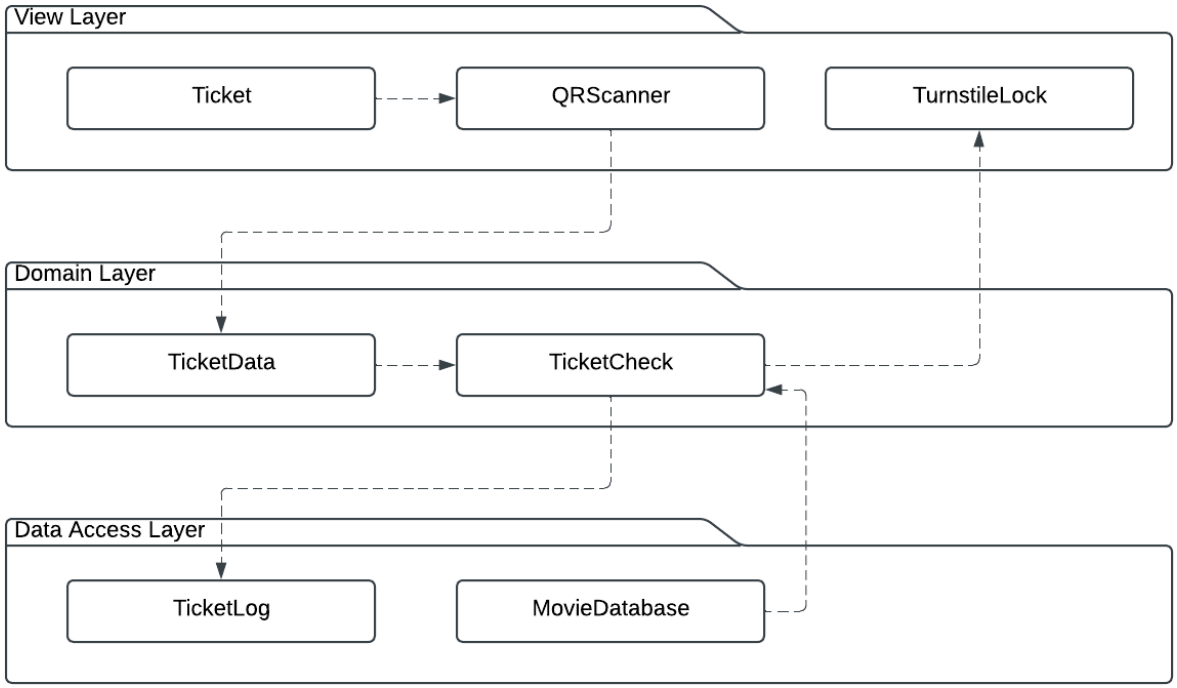
3. Deployment Diagram



Component Diagram

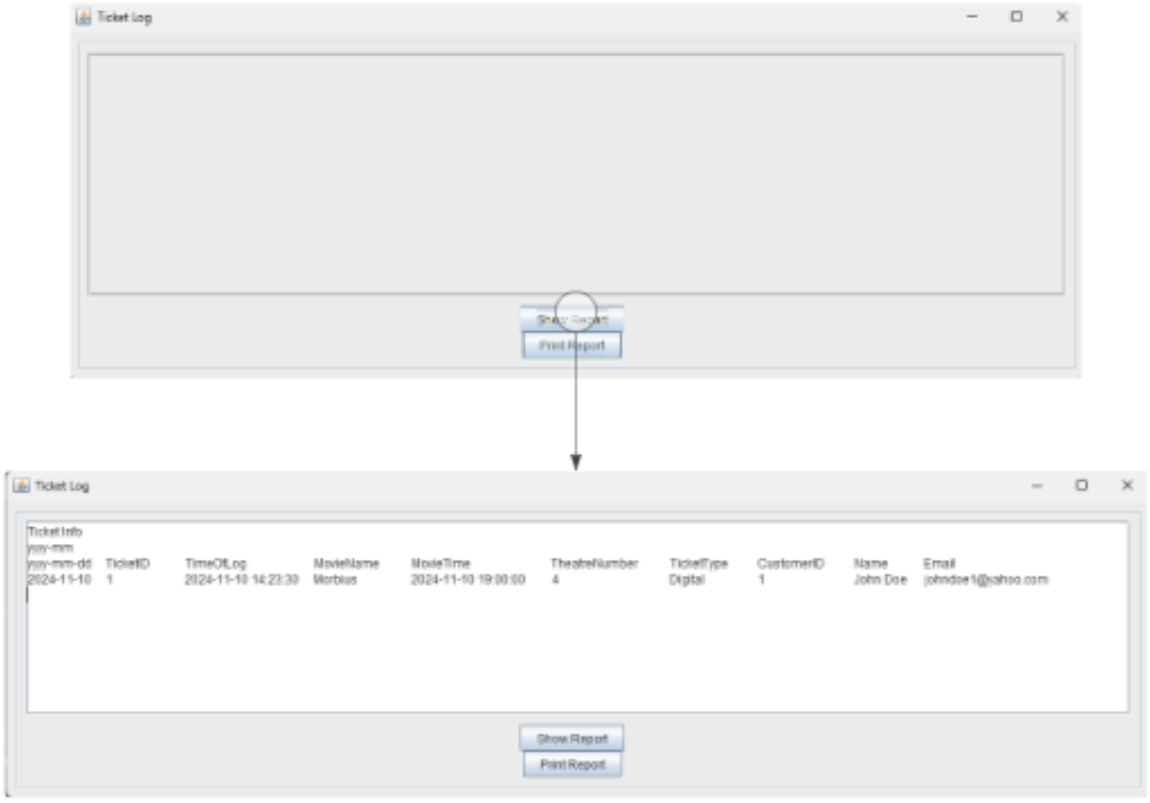


Package Diagram

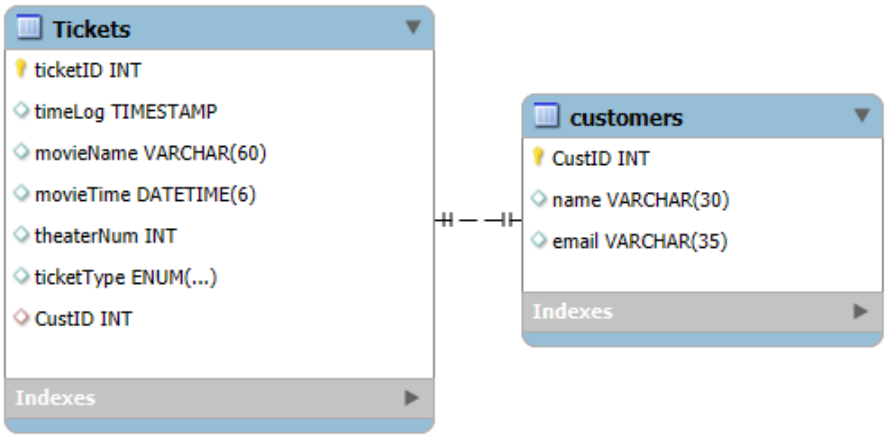


4. UI Design

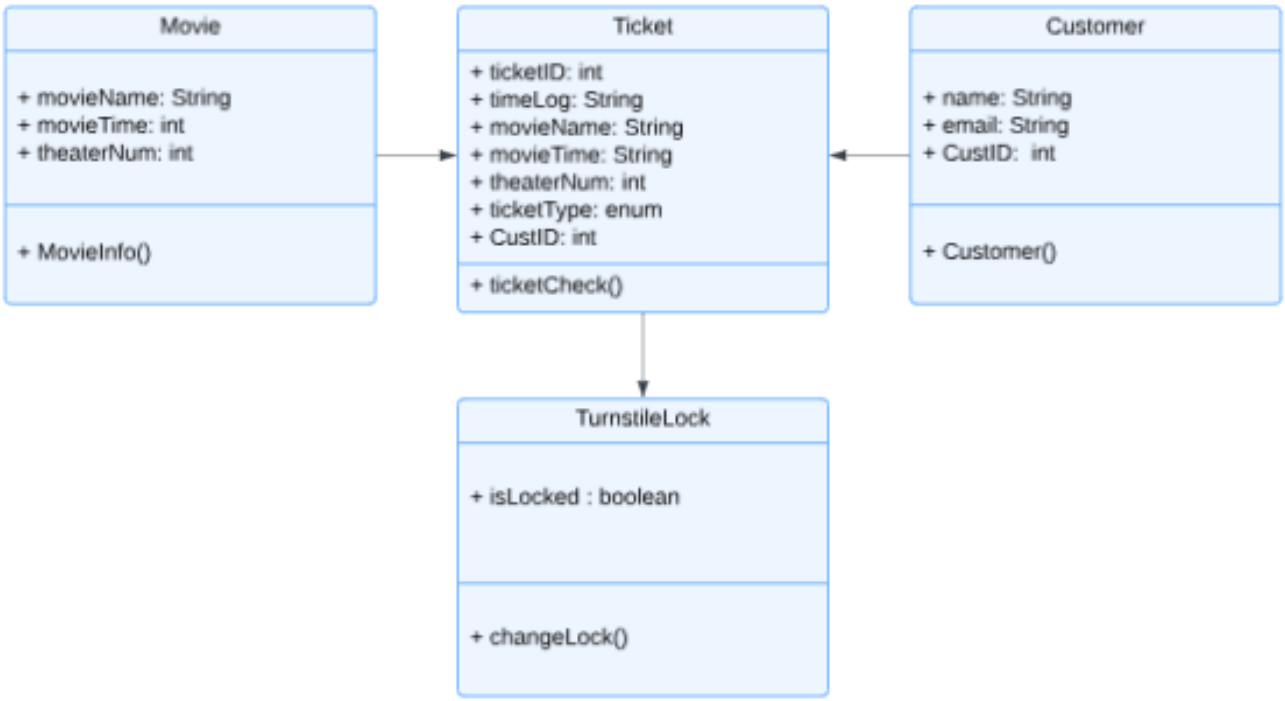
The design is for a reporting interface that allows for printing of reports.



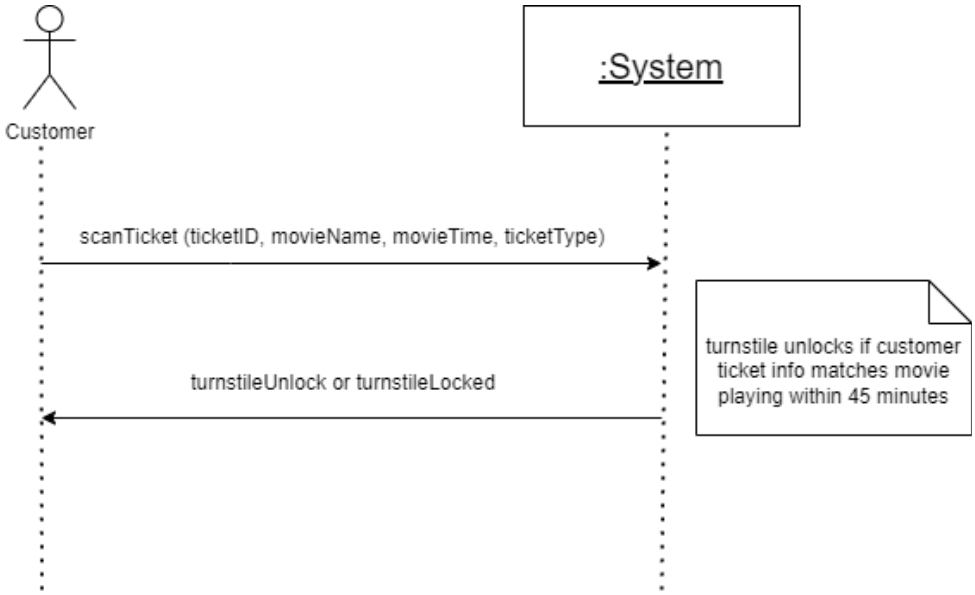
5. Database Design



6. Design Class Diagram



System Sequence Diagram



State Machine Diagram