**Buy movie tickets**

**I. Problem**

* **A movie theater** wants a program to **sell tickets** and manage customer information who are members of them. They will keep customer information such as ID, name, and number of points that customers accumulate after purchasing tickets. These points can be exchanged for discounts.
* If the customer is not a member, we can register them as a member or not.
* Accumulated points can only be applied to customers who are already members
* Assumption that we have 3 types of ticket:

|  |  |
| --- | --- |
| Price of ticket | Point |
| LOW: 60000đ | 1 |
| NORMAL: 80000đ | 2 |
| HIGH: 100000đ | 3 |
| *10 points = 50000đ (discount)* | |

**II. Solve problem**

We will organize the program in a structured way including Person, Hashtable, Seat and Cinema.

1. **Person structure**

This structure will keep customer information who are members of cinema including ID, name, and accumulated point. Notice that the customer’s ID will be encoded to security.

1. **Hashtable**

* This structure will store all customers as a hash table. The ID in the encrypted form will be hashed to become the key stored in the hashtable. For collision handling, we use double hashing in this problem.
* The hash table's data will be read and written to the file.

1. **Seat**

Every seat in the movie theater has a price, status booked or not, and point that you will get after book it.

1. **Cinema**

This is the biggest structure that you can manage hashtable and seat. Its role:

* Reserve seat for customer: use array to store all seat of the cinema so we can apply **binary search** to find number seat for customer.
* Cancel seat: cancel seat that customer has already chosen
* Payment: make payments and accumulate points for cuscomer
* Discount:
  + If the customer's accumulated points meet the criteria for a discount, the discount will be applied to the bill immediately
  + If the customer has just registered as a member and has enough accumulated points, the discount will also be applied.
* Calculate sold tickets and revenue