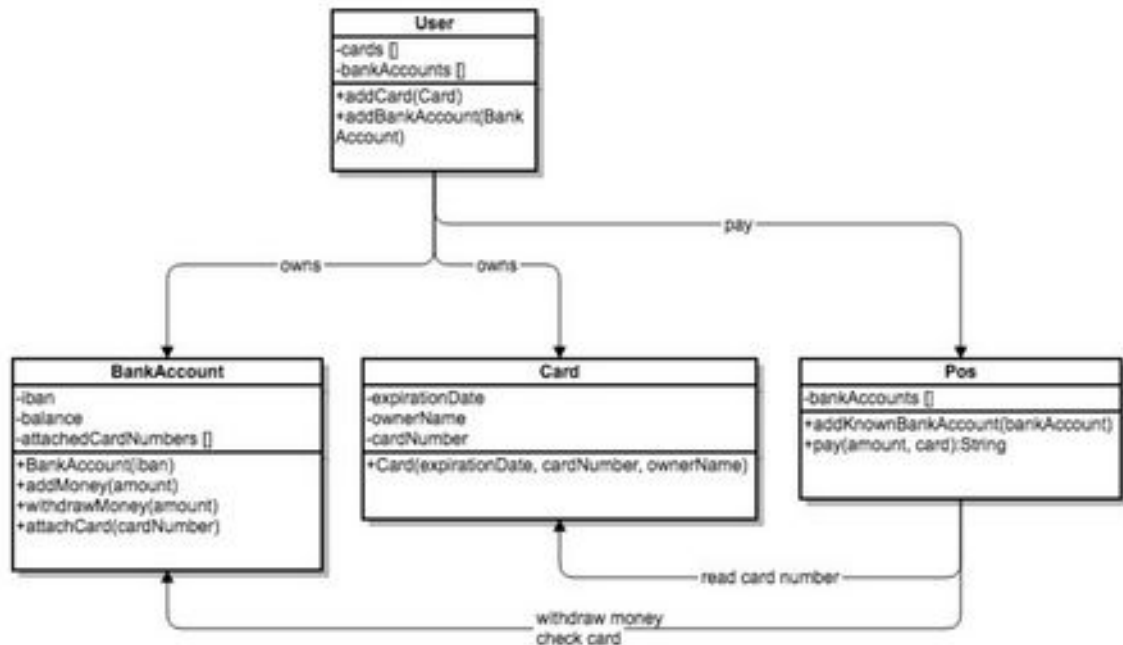


1. Write a POS back end payment service.

The goal of this exercise is to design and implement a simple service that should be called by a POS whenever a payment is processed.

Define least four classes: User, Card, BankAccount and PosService.

In diagram below you should see, relations between classes and methods that should be created in each of them.



Relationships between the entities that are stated in the requirements should be as following:

- User has BankAccounts
- User has Cards
- Cards are emitted to some of the BankAccounts
- User interacts with Pos via a pay action
- Pos prints Receipts for both successful payments and failed payments
- Pos interacts with BankAccounts via transactions

Take into account the **exceptional** flows of the system:

- Payment will not work if the card is expired
- Payment will not work if there is not enough money in the account
- Payment will not work if the Pos can't find the bank account(a simplification here, in reality, the POS should be able to process card's network like VISA, Mastercard, Amex etc, but not to have any info about specific card)

Add at least 4 users with cards associated with bank accounts, and process different transactions for covering the following scenarios:

- If user makes payment at pos and has enough money, then money is withdrawn from the bank account and a receipt is printed with the payed sum
- If user makes payment at pos and does not have enough money then money is not withdrawn and an error receipt is printed.
- If user makes payment at pos and the card is expired then money is not withdrawn and an error receipt is printed.
- If user makes payment at pos and the pos does not know about the bank account withdrawn and an error receipt is printed.

Note: For storing the to-many relations you may use arrays as shown in diagram or (if you are more courageous) use List and ArrayList, as shown in our previous class example; check the java API for List:

<https://docs.oracle.com/javase/10/docs/api/java/util/List.html>

NOTE: * The marked exercises are not mandatory for this homework, only for those who want to work additionally.