Java CD出租销售店作业

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一、设计目标:

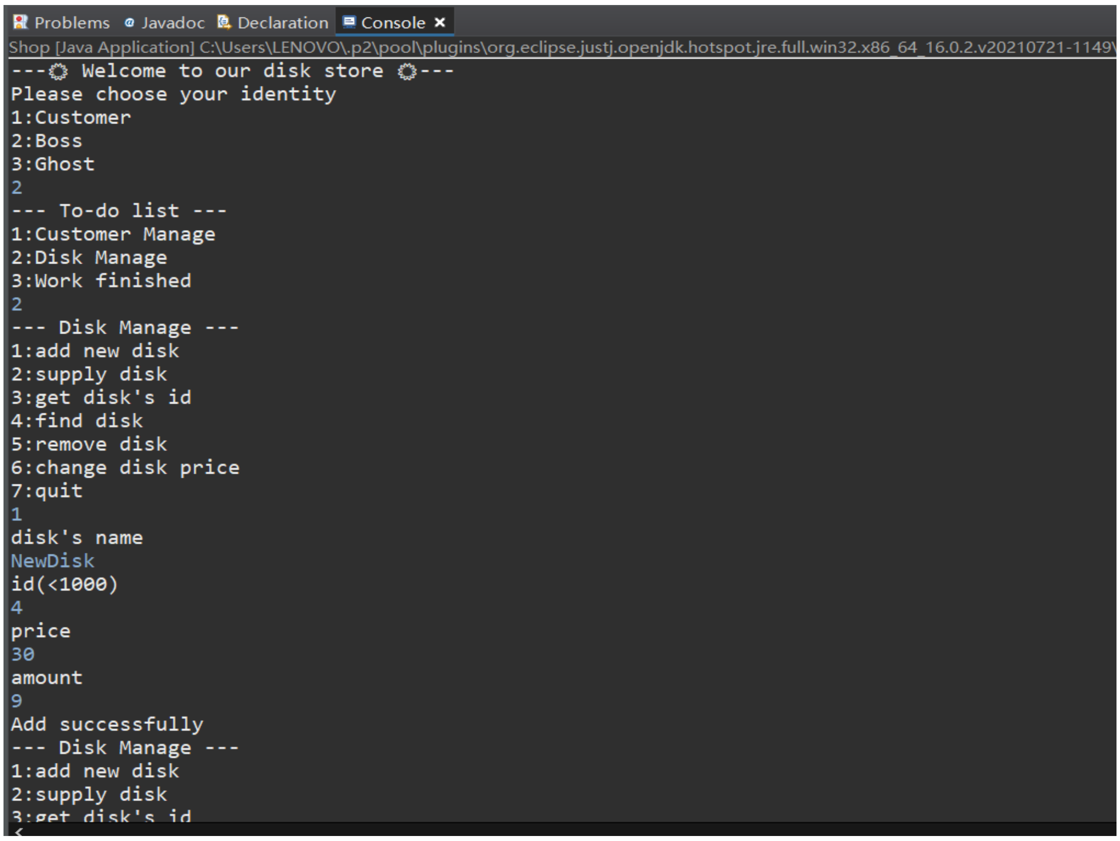
假设你在业余时间经营一个会员制的 CD 出租销售店，需要一个管理程序。
完成功能:
1.增加、删除会员
2.出租、销售 CD
3.进货、统计

二、程序亮点:

1.具备输入检查及完备的特殊情况处理，有较强的健壮性。
2.优化了面向用户的流程，指引清晰，界面整洁。
3.代码功能模块明确，可读性强。

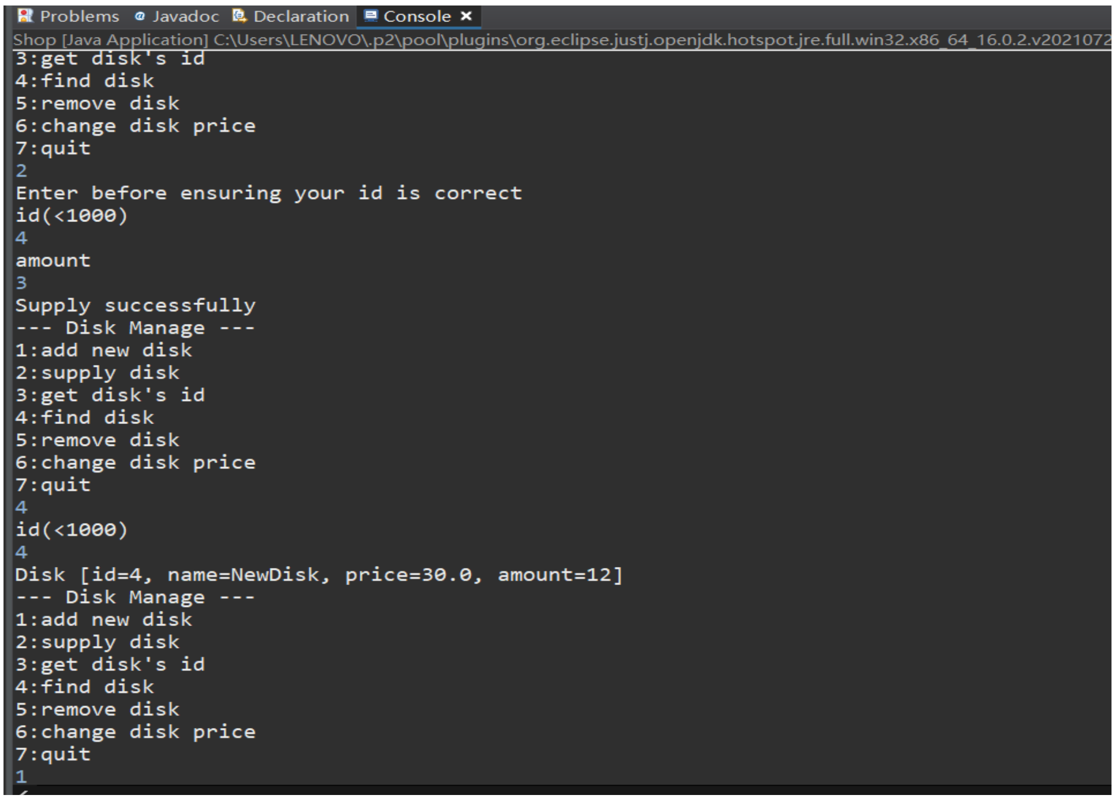
三、运行实例:

（以连续进行的一次测试作为实例）



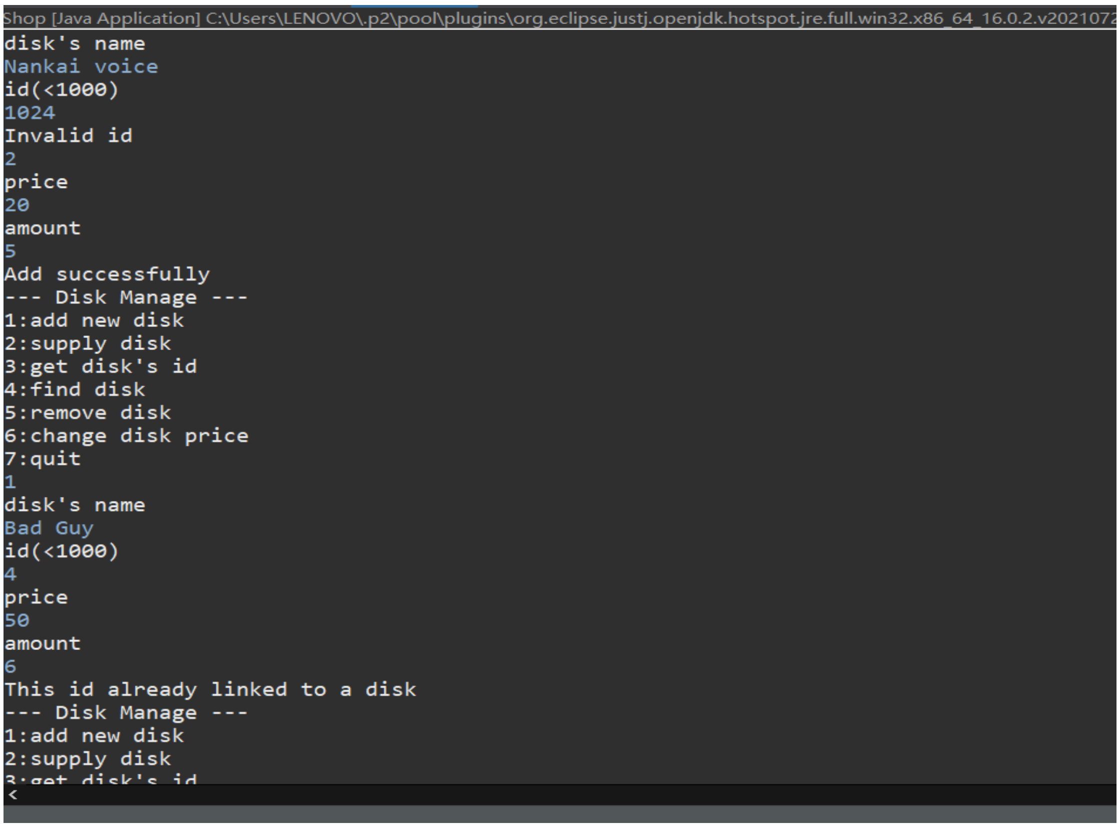
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v20210721-1149\
---۞ Welcome to our disk store ۞---
Please choose your identity
1:Customer
2:Boss
3:Ghost
2
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
2
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
1
disk's name
NewDisk
id(<1000)
4
price
30
amount
9
Add successfully
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
```

测试添加新 CD 功能



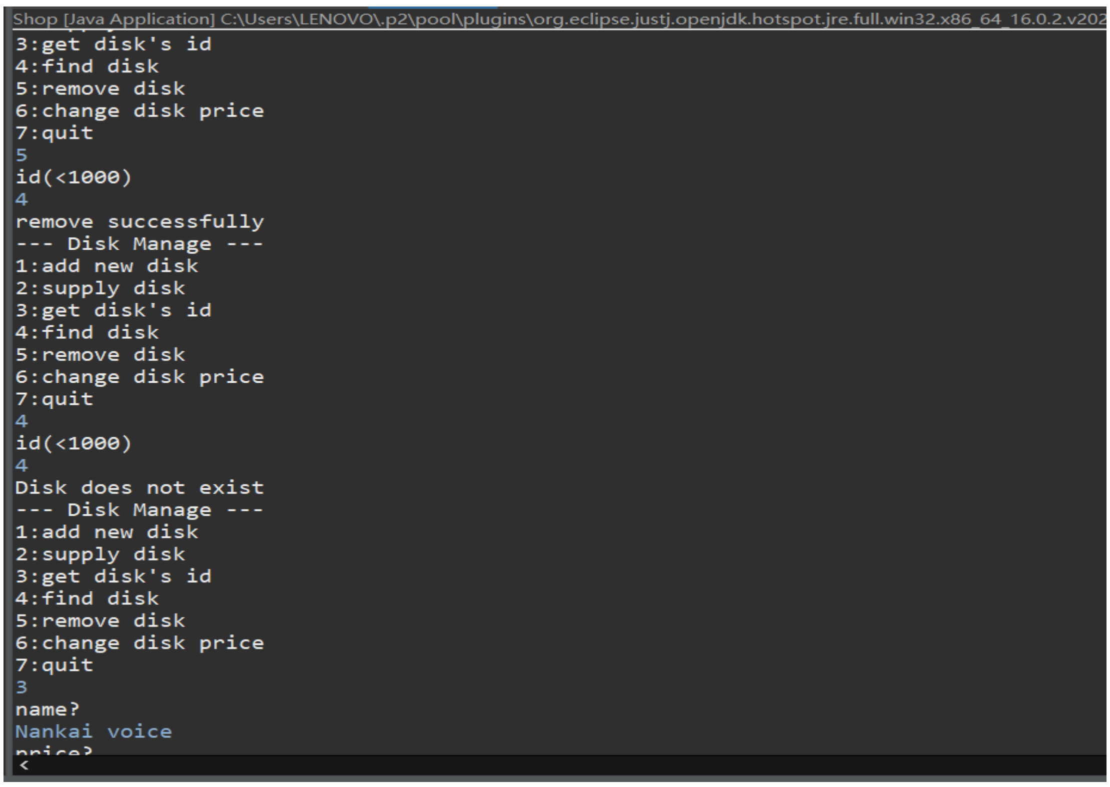
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v2021072
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
2
Enter before ensuring your id is correct
id(<1000)
4
amount
3
Supply successfully
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
4
id(<1000)
4
Disk [id=4, name=NewDisk, price=30.0, amount=12]
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
1
```

查找刚刚添加的 CD



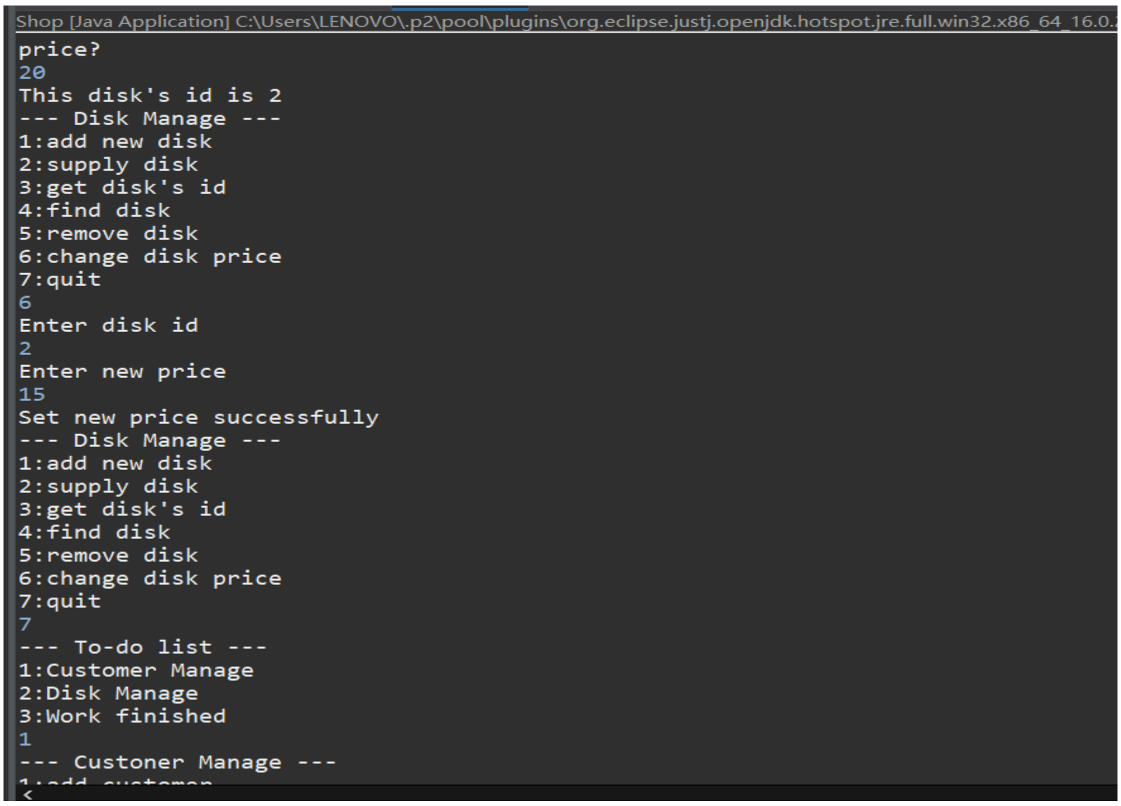
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v2021072
disk's name
Nankai voice
id(<1000)
1024
Invalid id
2
price
20
amount
5
Add successfully
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
1
disk's name
Bad Guy
id(<1000)
4
price
50
amount
6
This id already linked to a disk
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
```

添加 CD 异常处理



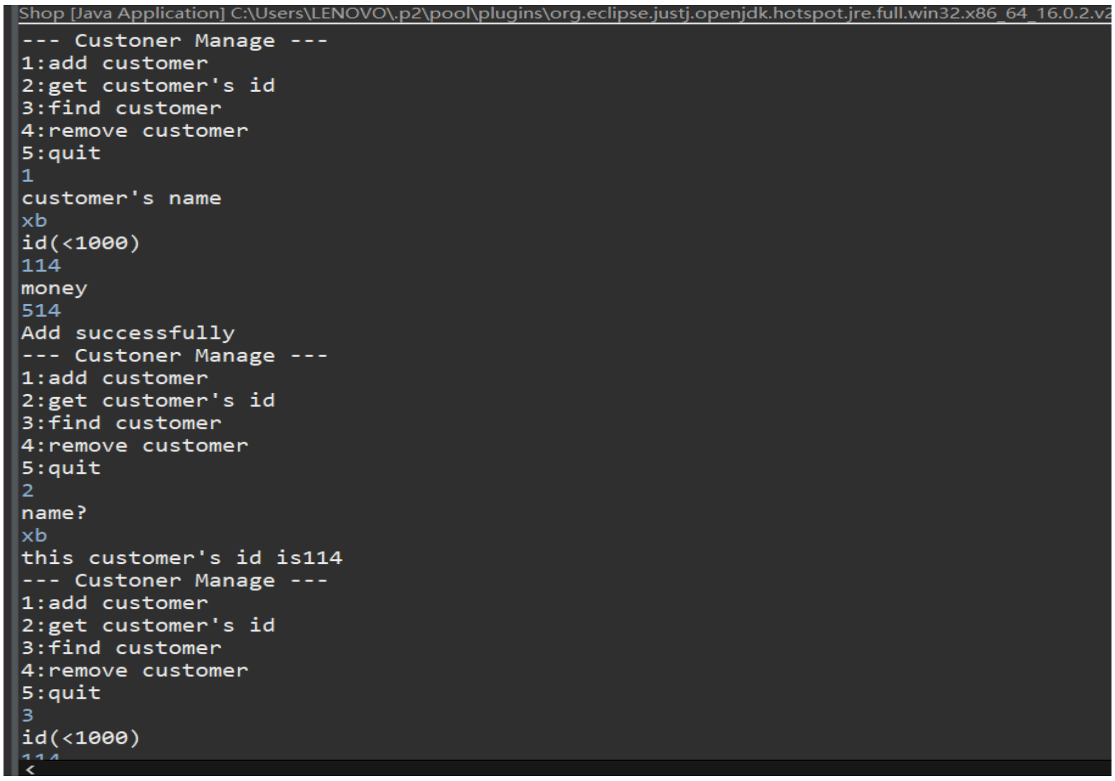
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v202
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
5
id(<1000)
4
remove successfully
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
4
id(<1000)
4
Disk does not exist
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
3
name?
Nankai voice
```

删除 CD



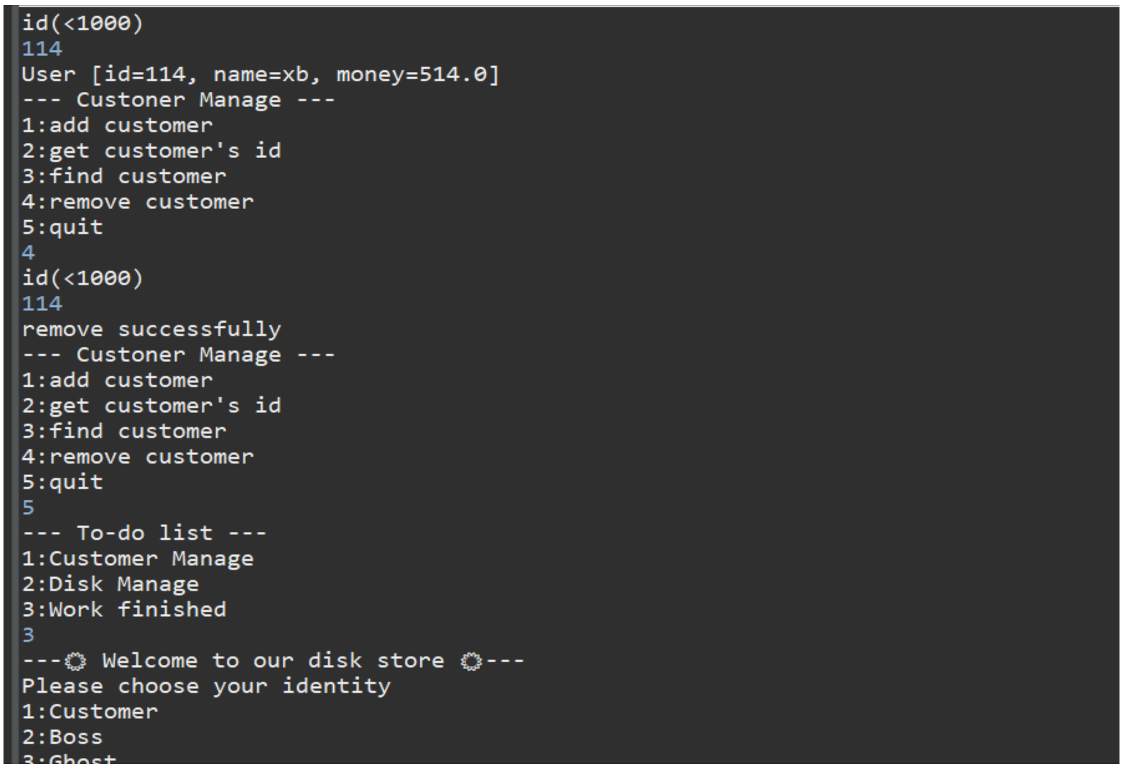
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.
price?
20
This disk's id is 2
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
6
Enter disk id
2
Enter new price
15
Set new price successfully
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
7
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
1
--- Custoner Manage ---
```

获取 ID



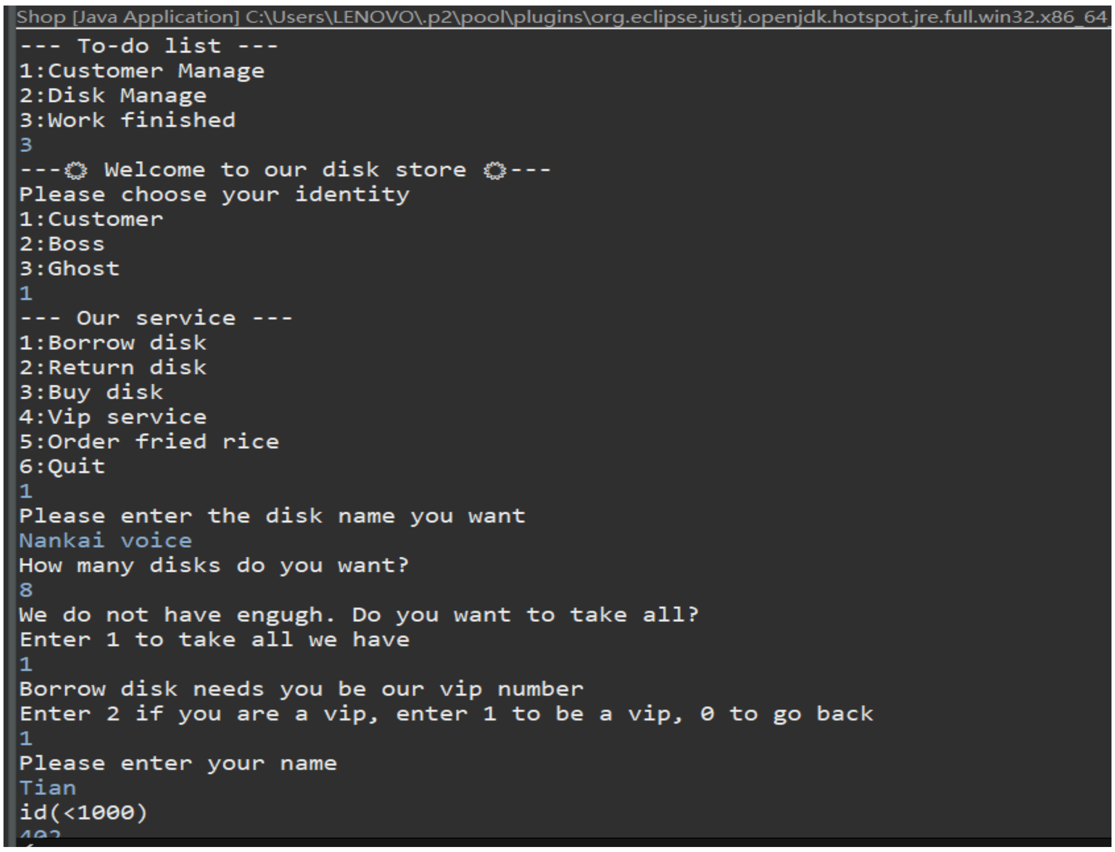
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v2
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
1
customer's name
xb
id(<1000)
114
money
514
Add successfully
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
2
name?
xb
this customer's id is114
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
3
id(<1000)
```

客户管理-添加



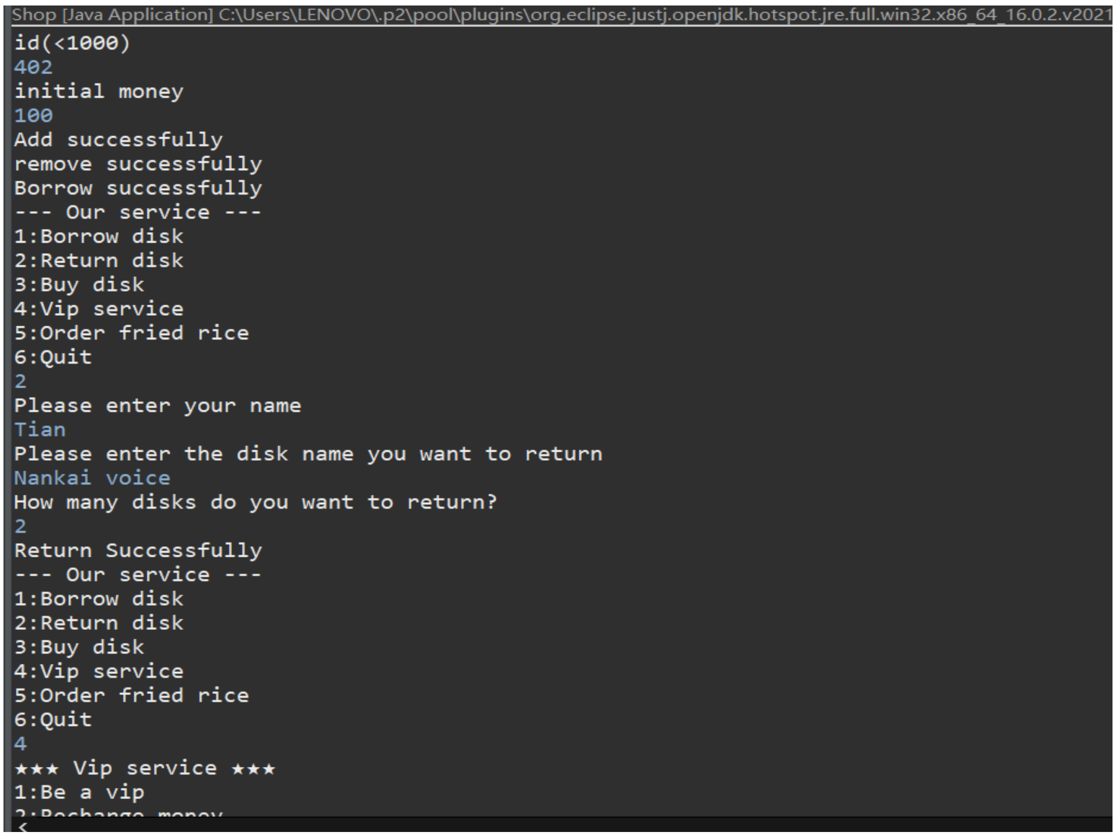
```
id(<1000)
114
User [id=114, name=xb, money=514.0]
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
4
id(<1000)
114
remove successfully
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
5
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
3
---❂ Welcome to our disk store ❂---
Please choose your identity
1:Customer
2:Boss
3:Ghost
```

客户管理-删除



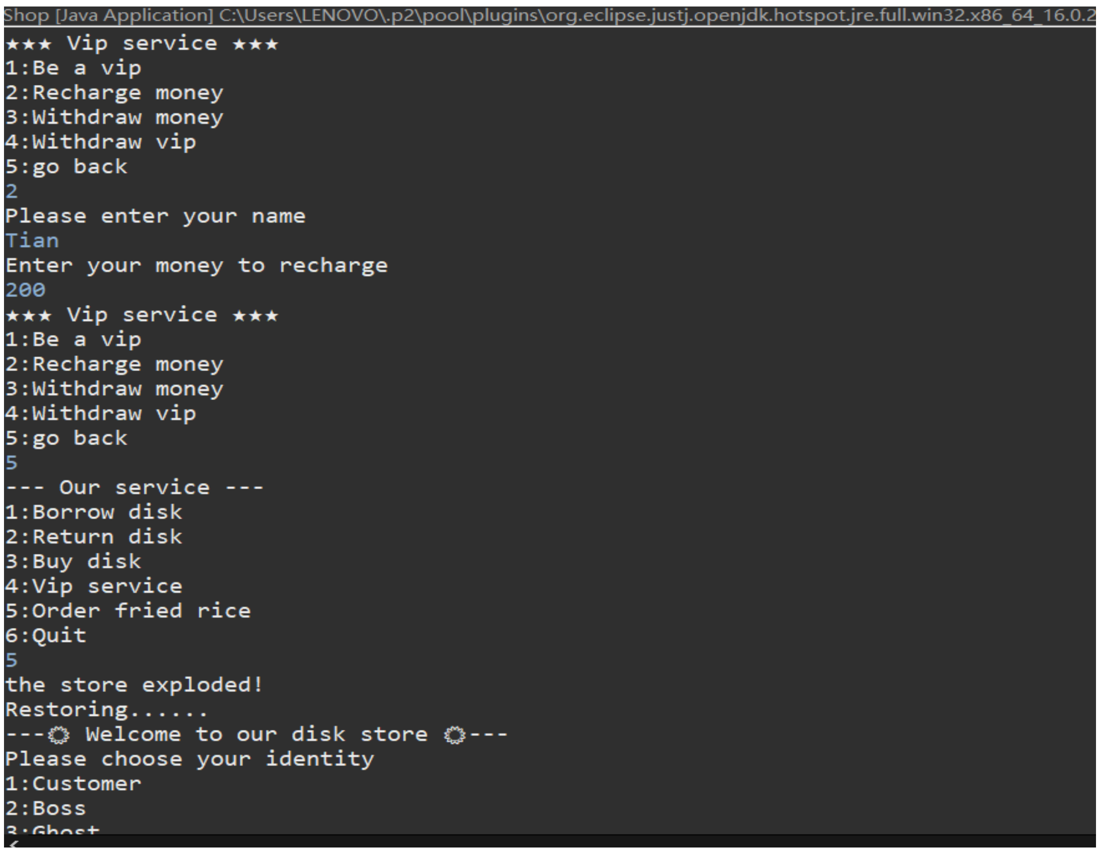
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
3
---⚙ Welcome to our disk store ⚙---
Please choose your identity
1:Customer
2:Boss
3:Ghost
1
--- Our service ---
1:Borrow disk
2:Return disk
3:Buy disk
4:Vip service
5:Order fried rice
6:Quit
1
Please enter the disk name you want
Nankai voice
How many disks do you want?
8
We do not have engugh. Do you want to take all?
Enter 1 to take all we have
1
Borrow disk needs you be our vip number
Enter 2 if you are a vip, enter 1 to be a vip, 0 to go back
1
Please enter your name
Tian
id(<1000)
402
```

租借 CD



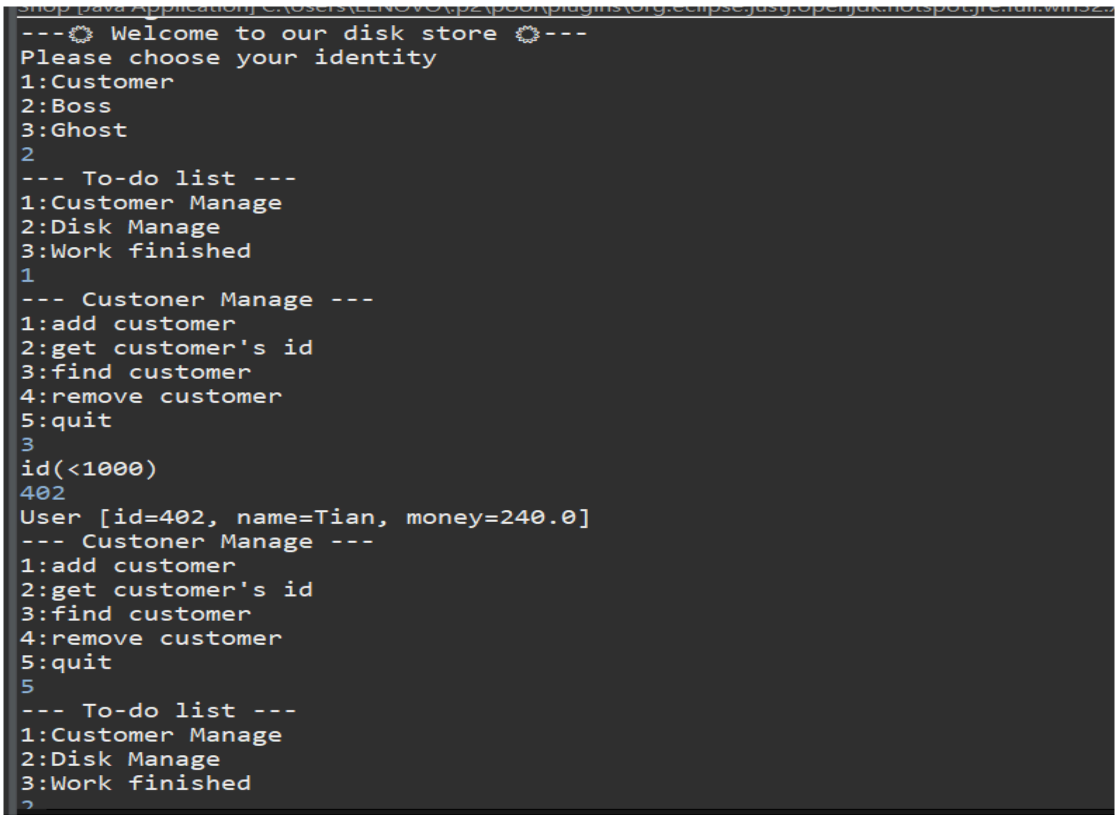
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v2021
id(<1000)
402
initial money
100
Add successfully
remove successfully
Borrow successfully
--- Our service ---
1:Borrow disk
2:Return disk
3:Buy disk
4:Vip service
5:Order fried rice
6:Quit
2
Please enter your name
Tian
Please enter the disk name you want to return
Nankai voice
How many disks do you want to return?
2
Return Successfully
--- Our service ---
1:Borrow disk
2:Return disk
3:Buy disk
4:Vip service
5:Order fried rice
6:Quit
4
*** Vip service ***
1:Be a vip
2:Recharge money
```

归还 CD（remove 是指从 disk book 中移除）



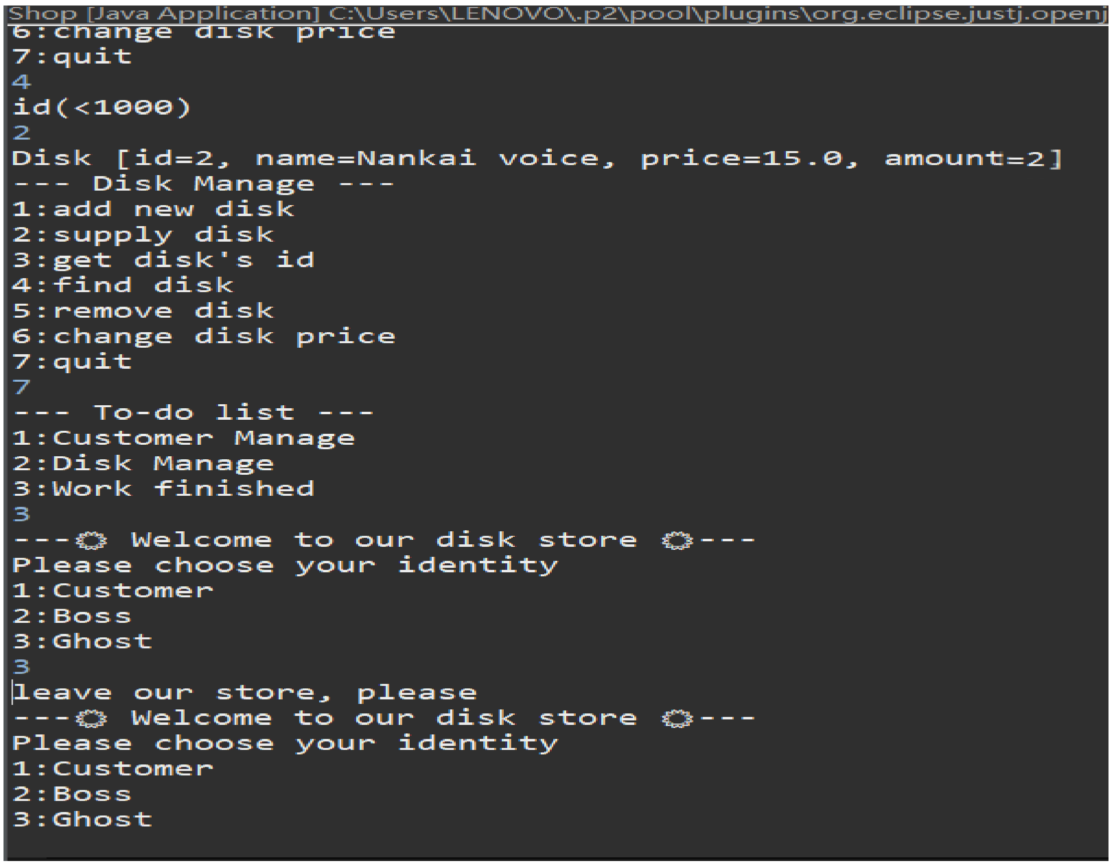
```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2
★★★ Vip service ★★★
1:Be a vip
2:Recharge money
3:Withdraw money
4:Withdraw vip
5:go back
2
Please enter your name
Tian
Enter your money to recharge
200
★★★ Vip service ★★★
1:Be a vip
2:Recharge money
3:Withdraw money
4:Withdraw vip
5:go back
5
--- Our service ---
1:Borrow disk
2:Return disk
3:Buy disk
4:Vip service
5:Order fried rice
6:Quit
5
the store exploded!
Restoring......
---۞ Welcome to our disk store ۞---
Please choose your identity
1:Customer
2:Boss
3:Ghost
```

VIP 服务（不要在 CD 店点炒饭！）



```
---۞ Welcome to our disk store ۞---
Please choose your identity
1:Customer
2:Boss
3:Ghost
2
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
1
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
3
id(<1000)
402
User [id=402, name=Tian, money=240.0]
--- Custoner Manage ---
1:add customer
2:get customer's id
3:find customer
4:remove customer
5:quit
5
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
```

验证顾客余额变化

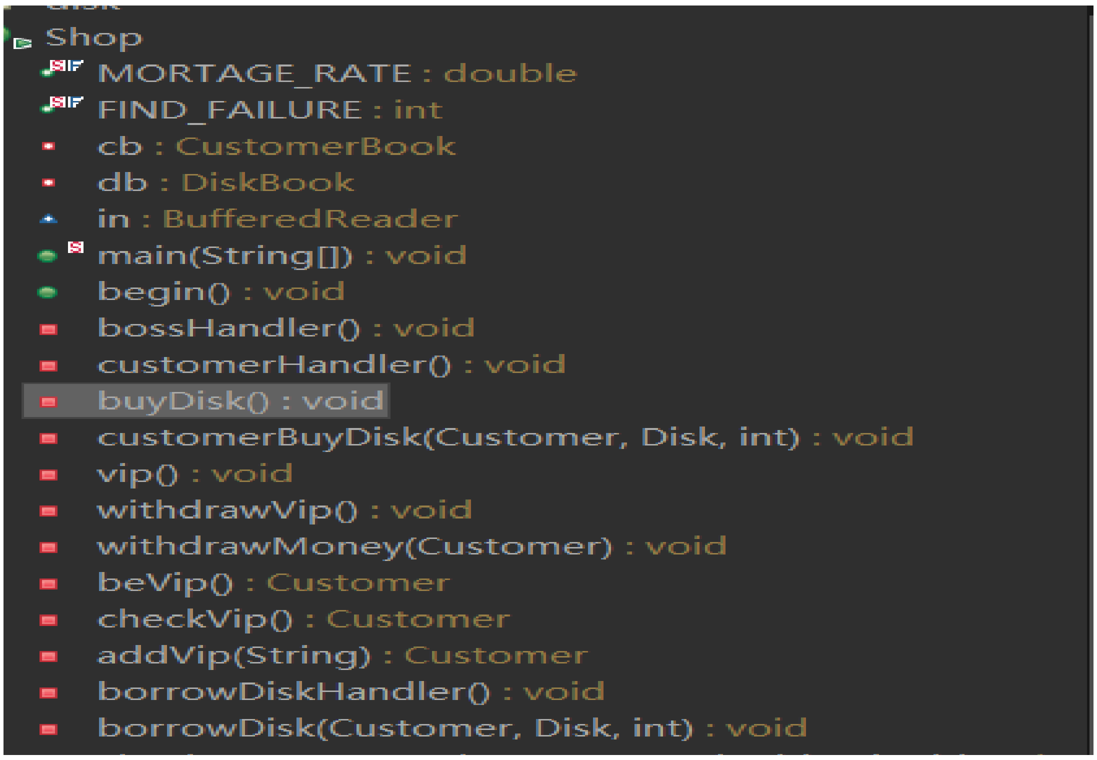


```
Shop [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openj
6:change disk price
7:quit
4
id(<1000)
2
Disk [id=2, name=Nankai voice, price=15.0, amount=2]
--- Disk Manage ---
1:add new disk
2:supply disk
3:get disk's id
4:find disk
5:remove disk
6:change disk price
7:quit
7
--- To-do list ---
1:Customer Manage
2:Disk Manage
3:Work finished
3
---۞ Welcome to our disk store ۞---
Please choose your identity
1:Customer
2:Boss
3:Ghost
3
leave our store, please
---۞ Welcome to our disk store ۞---
Please choose your identity
1:Customer
2:Boss
3:Ghost
```

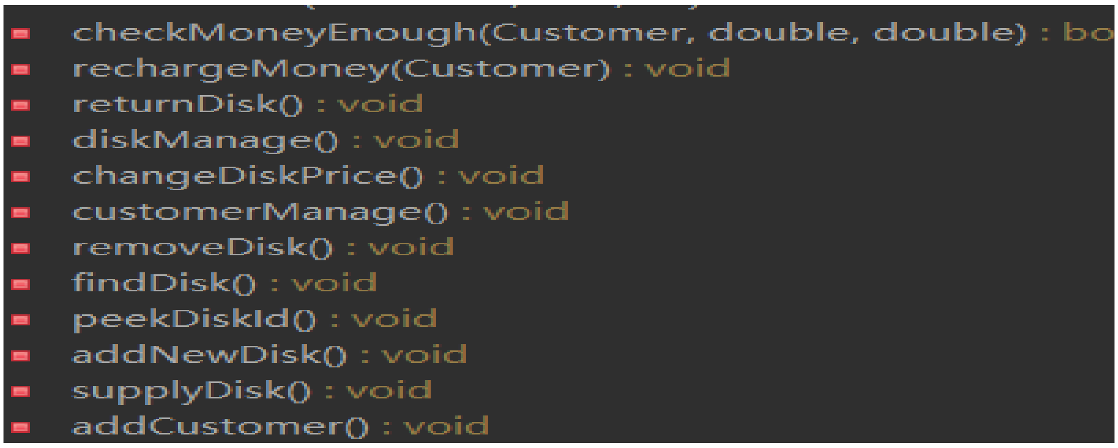
验证 CD 数量变化

四、程序代码：

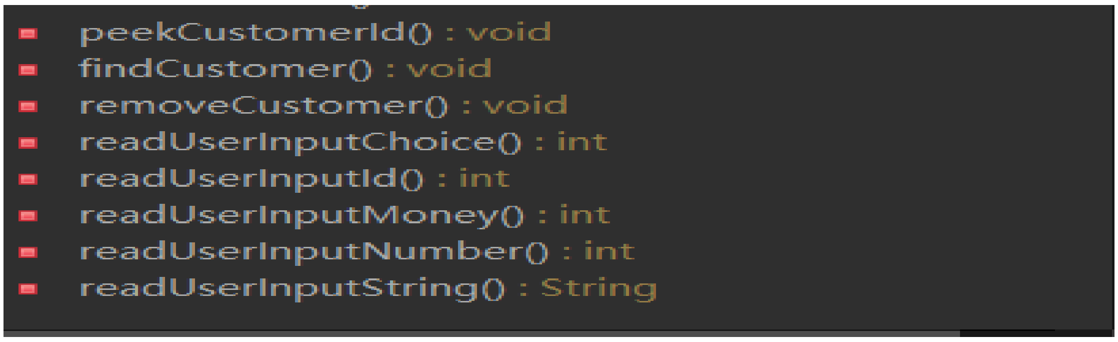
主程序 Outline



```
Shop
    MORTAGE_RATE : double
    FIND_FAILURE : int
    cb : CustomerBook
    db : DiskBook
    in : BufferedReader
    main(String[]) : void
    begin() : void
    bossHandler() : void
    customerHandler() : void
    buyDisk() : void
    customerBuyDisk(Customer, Disk, int) : void
    vip() : void
    withdrawVip() : void
    withdrawMoney(Customer) : void
    beVip() : Customer
    checkVip() : Customer
    addVip(String) : Customer
    borrowDiskHandler() : void
    borrowDisk(Customer, Disk, int) : void
```



```
checkMoneyEnough(Customer, double, double) : bo
rechargeMoney(Customer) : void
returnDisk() : void
diskManage() : void
changeDiskPrice() : void
customerManage() : void
removeDisk() : void
findDisk() : void
peekDiskId() : void
addNewDisk() : void
supplyDisk() : void
addCustomer() : void
```



```
peekCustomerId() : void
findCustomer() : void
removeCustomer() : void
readUserInputChoice() : int
readUserInputId() : int
readUserInputMoney() : int
readUserInputNumber() : int
readUserInputString() : String
```

主程序源代码（Shop.java）

```java
package disk;
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;

public class Shop {
  public static final double MORTAGE_RATE = 1.2;
  public static final int  FIND_FAILURE= -1;
  private CustomerBook cb = new CustomerBook();
  private DiskBook db = new DiskBook();
  BufferedReader in = new BufferedReader(new
InputStreamReader(System.in));
  public static void main(String[] args) {
      Shop shop = new Shop();
      shop.begin();
  }
  public void begin() {
      while(true) {
      //print main menu
```

```java
            System.out.println("---۞ Welcome to our disk store ۞---");
            System.out.println("Please choose your identity");
            System.out.println("1:Customer");
            System.out.println("2:Boss");
            System.out.println("3:Ghost");

            int choice = readUserInputChoice();
            switch (choice) {
            case 1:
                customerHandler();
                break;
            case 2:
                bossHandler();

                break;
            case 3:
                System.out.println("leave our store, please");
                break;
                default:
                break;
            }
        }
    }

    private void bossHandler() {
        while (true) {
            //print boss menu
            System.out.println("--- To-do list ---");
            System.out.println("1:Customer Manage");
            System.out.println("2:Disk Manage");
            System.out.println("3:Work finished");
            int choice = readUserInputChoice();
            switch (choice) {
            case 1:
                customerManage();
                break;
            case 2:
                diskManage();
                break;
            case 3:
                return;
            }
        }
    }

    private void customerHandler() {
        while(true) {
            //print customer menu
            System.out.println("--- Our service ---");
            System.out.println("1:Borrow disk");
            System.out.println("2:Return disk");
            System.out.println("3:Buy disk");
            System.out.println("4:Vip service");
            System.out.println("5:Order fried rice");
            System.out.println("6:Quit");
            int choice = readUserInputChoice();
            switch (choice) {
            case 1:
                borrowDiskHandler();
                break;
            case 2:
                returnDisk();
                break;
            case 3:
                buyDisk();
                break;
            case 4:
                vip();
                break;
            case 5:
                System.out.println("the store exploded!");
                System.out.println("Restoring......");
                try {
                    Thread.currentThread();
                    Thread.sleep(2000);
                } catch (InterruptedException e) {
                    e.printStackTrace();
                }
                return;
            default:
                return;
            }
        }

    }
    private void buyDisk() {
        System.out.println("Please enter the disk name you want");
        String name=readUserInputString();
        int id=db.getDiskId(name);
        if(id==FIND_FAILURE)
        {
            System.out.println("This store do not have the disk
you want");
            return;
        }
        else {
            System.out.println("How many disks do you want?");
            int askNumber=readUserInputNumber();
            int haveNumber=db.findDisk(id).getNum();
            if(askNumber>haveNumber)
            {
                System.out.println("We do not have enough. Do you
want to take all?");
                System.out.println("enter 1 to take all we have");
                int choice=readUserInputChoice();
                switch(choice) {
                case 1:
                    askNumber=haveNumber;
                    break;
                default:
                    return;
                }
            }
            Disk diskWhichBuy=db.findDisk(id);
            System.out.println("Buy disks needs you be our vip
member");
            System.out.println("enter 2 if you are a vip, enter 1
to be a vip, 0 to go back");
            int choice=readUserInputChoice();
            Customer customerWhoBuy;
            switch(choice) {
            case 2:
                customerWhoBuy=checkVip();

customerBuyDisk(customerWhoBuy,diskWhichBuy,askNumber);
                break;
            case 1:
                customerWhoBuy=beVip();

customerBuyDisk(customerWhoBuy,diskWhichBuy,askNumber);
```

```
                break;
            case 0:
                return;
            default:
                return;
            }
        }
    }
    private void customerBuyDisk(Customer customerWhoBuy, Disk
diskWhichBuy, int askNumber) {
        double price=diskWhichBuy.getPrice();
        double money=customerWhoBuy.getMoney();
        double cost=price*askNumber;
        boolean wantToborrow=false;
        wantToborrow=checkMoneyEnough(customerWhoBuy,cost,money);
        if(wantToborrow==false)
        {
            return;
        }
        else {

            diskWhichBuy.setNum(diskWhichBuy.getNum()-
askNumber);//change in disk book
            db.setDisk(diskWhichBuy);
            diskWhichBuy.setNum(askNumber);//change in customer
borrowed book
            customerWhoBuy.addBuyDisk(diskWhichBuy);
            customerWhoBuy.setMoney(money-cost);
            cb.setCustomer(customerWhoBuy);
            System.out.println("You got this disk!");
        }
    }
    private void vip() {
        while(true) {
            System.out.println("★★★ Vip service ★★★");
            System.out.println("1:Be a vip");
            System.out.println("2:Recharge money");
            System.out.println("3:Withdraw money");
            System.out.println("4:Withdraw vip");
            System.out.println("5:go back");
            int choice = readUserInputChoice();
            switch (choice) {
            case 1:
                beVip();
                break;
            case 2:
                rechargeMoney(checkVip());
                break;
            case 3:
                withdrawMoney(checkVip());
                break;
            case 4:
                withdrawVip();
                break;
            case 5:
                return;
            }
        }
    }


    private void withdrawVip() {
        Customer customer=checkVip();
//      withdrawMoney(customer);
        System.out.println("Sorry, your money can not withdraw.
  Continue?");
        System.out.println("Enter 1 to delete your vip
  information");
        int choice=readUserInputChoice();
        switch(choice) {
        case 1:
            cb.removeCustomer(customer.getId());
            break;
        default:
            return;
        }

    }
    private void withdrawMoney(Customer customer) {
  //      The reason I make them as comment is
  //      not they are incorrect for running the program
//      but in most store in reality this service is not
  available(
        System.out.println("Sorry, you can not do this");
  //      System.out.println("Enter your money to withdraw");
  //      Integer money=readUserInputMoney();
  //      double moneyInVip=customer.getMoney();
  //      if(money-moneyInVip>0)
  //      {
```

```
//          System.out.println("you do not have so much money to
  withdraw");
  //      }
  //      else {
  //          customer.setMoney(customer.getMoney()-money);
  //      }

    }
    private Customer beVip() {
        System.out.println("Please enter your name");
        String name=readUserInputString();
        int id=cb.getCustomerId(name);
        if(id>=0)
        {
            System.out.println("You have already been a vip");
            return cb.findCustomer(id);
        }
        else {
            return addVip(name);
        }


    }
    private Customer checkVip() {
        System.out.println("Please enter your name");
        String name=readUserInputString();
        int id=cb.getCustomerId(name);
        if(id>=0)
        {
            return cb.findCustomer(id);
        }
        else {
            System.out.println("Did not find your information,
  please add vip");
            return addVip(name);
        }
    }
    private Customer addVip(String name) {
        boolean successIndicator=false;
        Customer nc=null;
        while(successIndicator==false) {
            System.out.println("id(<1000)");
            int id = readUserInputId();
            System.out.println("initial money");
```

```java
          int money =readUserInputMoney();
          nc = new Customer(id, name, money);
          successIndicator=cb.addCustomer(nc);
      }

      return nc;
  }
  private void borrowDiskHandler() {
      System.out.println("Please enter the disk name you want");
      String name=readUserInputString();
      int id=db.getDiskId(name);
      if(id==FIND_FAILURE)
      {
          System.out.println("This store does not have the disk
you want");
          return;
      }
      else {
          System.out.println("How many disks do you want?");
          int askNumber=readUserInputNumber();
          int haveNumber=db.findDisk(id).getNum();
          if(askNumber>haveNumber)
          {
              System.out.println("We do not have engugh. Do you
want to take all?");
              System.out.println("Enter 1 to take all we have");
              int choice=readUserInputChoice();
              switch(choice) {
              case 1:
                  askNumber=haveNumber;
                  break;
              default:
                  return;
              }
          }
          Disk diskWhichBorrow=db.findDisk(id);
          System.out.println("Borrow disk needs you be our vip
number");
          System.out.println("Enter 2 if you are a vip, enter 1
to be a vip, 0 to go back");
          int choice=readUserInputChoice();
          Customer customerWhoBorrow;
          switch(choice) {
          case 2:
              customerWhoBorrow=checkVip();

borrowDisk(customerWhoBorrow,diskWhichBorrow,askNumber);
              break;
          case 1:
              customerWhoBorrow=beVip();

borrowDisk(customerWhoBorrow,diskWhichBorrow,askNumber);
              break;
          case 0:
              return;
          default:
              return;
          }
      }
  }


  private void borrowDisk(Customer customerWhoBorrow,Disk
diskWhichBorrow,int askNumber) {
      double price=diskWhichBorrow.getPrice();
      double money=customerWhoBorrow.getMoney();
      double cost=MORTAGE_RATE*price*askNumber;
      boolean wantToborrow=false;

wantToborrow=checkMoneyEnough(customerWhoBorrow,cost,money);
      if(wantToborrow==false)
      {
          return;
      }
      else {

          if(diskWhichBorrow.getNum()==askNumber)
          {
              db.removeDisk(diskWhichBorrow.getId());
          }
          else {
              diskWhichBorrow.setNum(diskWhichBorrow.getNum()-
askNumber);//change in disk book
              db.setDisk(diskWhichBorrow);
          }
          Disk customerGotDisk=diskWhichBorrow;
          customerGotDisk.setNum(askNumber);
          customerWhoBorrow.addBorrowDisk(customerGotDisk);
          customerWhoBorrow.setMoney(money-cost);
```

```
          cb.setCustomer(customerWhoBorrow);
          System.out.println("Borrow successfully");
      }
  }
  private boolean checkMoneyEnough(Customer 
customerWhoBorrow,double cost, double money) {
      while(money-cost<0)
      {
          System.out.println("Your money is not enough. Do you 
want to recharge money in your account? ");
          System.out.println("Enter 1 to recharge, 0 to go 
back");
          int choice=readUserInputChoice();
          switch(choice) {
          case 1:
              rechargeMoney(customerWhoBorrow);
              break;
          case 0:
              return false;
          default:
              return false;
          }
      }
      return true;

  }
  private void rechargeMoney(Customer customer) {
      System.out.println("Enter your money to recharge");
      int money=readUserInputMoney();
      customer.setMoney(customer.getMoney()+money);

  }

  private void returnDisk() {
      Customer customerWhoReturn=checkVip();
      System.out.println("Please enter the disk name you want 
to return");
      String name=readUserInputString();
      Disk borrowedDisk=customerWhoReturn.checkBorrowDisk(name);
      if(borrowedDisk==null)
      {
          System.out.println("You do not have the disk you 
want");
          return;
```

```
        }

        else {
            System.out.println("How many disks do you want to 
return?");
            int returnNumber=readUserInputNumber();
            int borrowNumber=borrowedDisk.getNum();
            if(returnNumber>borrowNumber)
            {
                System.out.println("You do not have so many 
disks");
                return;
            }
            else
            {

            double 
returnMoney=returnNumber*borrowedDisk.getPrice();

customerWhoReturn.setMoney(customerWhoReturn.getMoney()+returnM
oney);
                if(borrowNumber==returnNumber)
                {

customerWhoReturn.deleteDisk(borrowedDisk.getId());
                }
                else {
                    borrowedDisk.setNum(borrowNumber-
returnNumber);
                    customerWhoReturn.setDisk(borrowedDisk);
                }
                Disk returnedDisk=borrowedDisk;
                Disk 
returnedDiskInDiskBook=db.findDisk(returnedDisk.getId());
                if(returnedDiskInDiskBook==null)
                {
                    db.setDisk(returnedDisk);
                }
                else
                {

returnedDisk.setNum(returnedDiskInDiskBook.getNum()+returnNumbe
r);
                    db.setDisk(returnedDisk);
```

```java
                }
                cb.setCustomer(customerWhoReturn);
                System.out.println("Return Successfully");
            }
        }
    }
    private void diskManage() {
        while(true) {
            //disk manage menu
            System.out.println("--- Disk Manage ---");
            System.out.println("1:add new disk");
            System.out.println("2:supply disk");
            System.out.println("3:get disk's id");
            System.out.println("4:find disk");
            System.out.println("5:remove disk");
            System.out.println("6:change disk price");
            System.out.println("7:quit");
            int choice = readUserInputChoice();
            switch(choice) {
            case 1:
                addNewDisk();
                break;
            case 2:
                supplyDisk();
                break;
            case 3:
                peekDiskId();
                break;
            case 4:
                findDisk();
                break;
            case 5:
                removeDisk();
                break;
            case 6:
                changeDiskPrice();
                break;
            case 7:
                return;
            default:
                return;
            }

        }
    }

    private void changeDiskPrice() {
        System.out.println("Enter disk id");
        int id=readUserInputId();
        Disk disk=db.findDisk(id);
        if(disk==null)
        {
            System.out.println("Disk does not exist");
        }
        else {
            System.out.println("Enter new price");
            int price=readUserInputMoney();
            disk.setPrice(price);
            db.setDisk(disk);
            System.out.println("Set new price successfully");
        }

    }

    private void customerManage() {
        while(true) {
//          customer manage menu
            System.out.println("--- Custoner Manage ---");
            System.out.println("1:add customer");
            System.out.println("2:get customer's id");
            System.out.println("3:find customer");
            System.out.println("4:remove customer");
            System.out.println("5:quit");
            int choice = readUserInputChoice();
            switch(choice) {
            case 1:
                addCustomer();
                break;
            case 2:
                peekCustomerId();
                break;
            case 3:
                findCustomer();
                break;
            case 4:
                removeCustomer();
                break;
```

```java
            case 5:
                return;
            default:
                return;
            }
        }
    }

    private void removeDisk() {
        System.out.println("id(<1000)");
            int id = readUserInputId();
            db.removeDisk(id);
    }
    private void findDisk() {
        System.out.println("id(<1000)");
            int id = readUserInputId();
            Disk disk = db.findDisk(id);
            if(disk==null)
            {
                System.out.println("Disk does not exist");
            }
            else {
                System.out.println(disk);
            }

    }
    private void peekDiskId() {

            System.out.println("name?");
            String name =readUserInputString();
            System.out.println("price?");
            int price = readUserInputMoney();
            db.peekDiskId(name,price);

    }
    private void addNewDisk() {
            System.out.println("disk's name");
            String name =readUserInputString();
            System.out.println("id(<1000)");
            int id = readUserInputId();
            System.out.println("price");
            int price =readUserInputMoney();
            System.out.println("amount");
            int number =readUserInputNumber();
            Disk nd = new Disk(id,name,price,number);
            db.addNewDisk(nd);

    }

    private void supplyDisk() {
            System.out.println("Enter before ensuring your id is
correct");
            System.out.println("id(<1000)");
            int id =readUserInputId();
            System.out.println("amount");
            int number = readUserInputNumber();
            db.supplyDisk(id,number);
    }
    private void addCustomer() {

            System.out.println("customer's name");
            String name = readUserInputString();
            System.out.println("id(<1000)");
            int id = readUserInputId();
            System.out.println("money");
            int money =readUserInputMoney();
            Customer nc = new Customer(id, name, money);
            cb.addCustomer(nc);
    }

    private void peekCustomerId() {
            System.out.println("name?");
            String name =readUserInputString();
            cb.peekCustomerId(name);

    }
    private void findCustomer() {
        System.out.println("id(<1000)");
            int id = readUserInputId();
            Customer customer = cb.findCustomer(id);
            if(customer==null)
            {
                System.out.println("The customer does not exist");
            }
            else {
                System.out.println(customer);
            }
```

```java
  }
  private void removeCustomer() {
      System.out.println("id(<1000)");
          int id = readUserInputId();
          cb.removeCustomer(id);
  }


//Input handlers with checking incorrect format
  private int readUserInputChoice() {
      try {
          String line;
          line = in.readLine();
          return Integer.parseInt(line);
      } catch (IOException e) {
          e.printStackTrace();
      }
      return 0;
  }
  private int readUserInputId() {
      int id;
      while(true) {
          try {
              id = Integer.parseInt(in.readLine());
              if(id>0&&id<1000)
              {
                  break;
              }
              else {
                  System.out.println("Invalid id");
              }
          } catch (IOException e) {
              // TODO Auto-generated catch block
              e.printStackTrace();
          }
      }

      return id;
  }
  private int readUserInputMoney() {
      int money;
      while(true) {
          try {
              money = Integer.parseInt(in.readLine());
```

```java
                if(money>=0)
                {
                    break;
                }
                else {
                    System.out.println("Invalid money");
                }
            } catch (IOException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }
        }

        return money;
    }
    private int readUserInputNumber() {
        int num;
        while(true) {
            try {
                num = Integer.parseInt(in.readLine());
                if(num>=0)
                {
                    break;
                }
                else {
                    System.out.println("Invalid money");
                }
            } catch (IOException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
            }
        }

        return num;
    }
    private String readUserInputString() {

        String name="";
        try {
            name = in.readLine();
        } catch (IOException e) {
            // TODO Auto-generated catch block
            e.printStackTrace();
        }
        return name;
    }
}
```

Disk.Java

```
package disk;

public class Disk {
    private int id;
    private String name;
    private double price;
    private int num;
    public Disk(int id, String name, int price, int num) {
        super();
        this.id = id;
        this.name = name;
        this.price = price;
        this.num = num;
    }
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public double getPrice() {
        return price;
    }
    public void setPrice(double price) {
        this.price = price;
    }
    public int getNum() {
        return num;
    }
```

```java
    public void setNum(int num) {
        this.num = num;
    }
    @Override
    public String toString() {
        return "Disk [id=" + id + ", name=" + name + ", price=" + 
price + ", amount=" + num + "]";
    }

}
```

DiskBook.java

```java

package disk;

public class DiskBook {
    private Disk[] data = new Disk[1000];
    public void addNewDisk(Disk d) {
        int id = d.getId();
        Disk disk = findDisk(id);
        if(disk==null) {
            data[id]=d;
            System.out.println("Add successfully");
        }else {
            System.out.println("This id already linked to a 
disk");
        }

    }
    public void print() {
        for (Disk disk : data) {
            System.out.println(disk);
        }
    }
    public void removeDisk(int id) {
        if(data[id]!=null)
        {
            data[id]=null;
            System.out.println("remove successfully");

        }
        else
        {
            System.out.println("this customer does not exist");
        }
    }
    public Disk findDisk(int id) {
        return data[id];
    }
    @Override
    public String toString() {
        String result = "";
        for (Disk disk : data) {
            if(disk!=null) {
                result += disk+"\n";
            }
        }
        return result;
//      return "DiskBook [data=" + Arrays.toString(data) + "]";
    }
    public void supplyDisk(int id,int number) {
        Disk disk = findDisk(id);
        if(disk==null) {
            System.out.println("Please choose add new disk");
        }else {
            int num = disk.getNum()+number;
            disk.setNum(num);
            System.out.println("Supply successfully");
        }

    }
    public void peekDiskId(String name,int price) {
        int min=Integer.MAX_VALUE;
        int id=-1;
        for (Disk disk : data) {
            if(disk!=null)

 if(name.equals(disk.getName())&&(double)price==disk.getPrice())
            {
                    //if more than 1 disk is the same, show the
less one
                    if(min>disk.getNum())
                    {
                        min=disk.getNum();
                        id=disk.getId();
                    }
            }
        }
        if(id==-1)
        {
            System.out.println("This disk does not exist");
        }
        else {
            System.out.println("This disk's id is "+id);
        }

    }
    public int getDiskId(String name) {
        double min=Double.POSITIVE_INFINITY;
        int id=-1;
        for (Disk disk : data) {
            if(disk!=null)
               if(name.equals(disk.getName()))
               {
                    //if more than 1 disk is the same, get the
cheapest one
                    if(min>disk.getPrice())
                    {
                        min=disk.getPrice();
                        id=disk.getId();
                    }

            }
        }
        return id;
    }
    public void setDisk(Disk disk)
    {
        data[disk.getId()]=disk;
    }

}
```

Customer.Java（包含两个数组用于保存接走和买走的 CD）

```java
package disk;

public class Customer {
  int id;
  String name;
  double money;
  private Disk[] diskBorrow=new Disk[1000];
  private Disk[] diskBuy=new Disk[1000];
  DiskBook note=new DiskBook();
  public Customer(int id, String name, int money) {
      super();
      this.id = id;
      this.name = name;
      this.money = money;
  }
  public Disk checkBorrowDisk(String cname)
  {
      double max=Double.NEGATIVE_INFINITY;
      Disk targetDisk=null;
      for (Disk disk : diskBorrow) {
          if(disk!=null)
          if(cname.equals(disk.getName()))
          {
                  //if more than 1 disk is the same, get the most expensive one
                  if(max<disk.getPrice())
                  {
                      max=disk.getPrice();
                      targetDisk=disk;
                  }

          }
      }
      return targetDisk;
  }

  public void addBorrowDisk(Disk disk)
  {
      diskBorrow[disk.getId()]=disk;

  }

  public void setDisk(Disk setDisk)
  {
        diskBorrow[setDisk.getId()]=setDisk;

    }
    public void deleteDisk(int id)
    {
        diskBorrow[id]=null;

    }
    public void addBuyDisk(Disk disk)
    {
        diskBuy[disk.getId()]=disk;

    }
    @Override
    public int hashCode() {
        final int prime = 31;
        int result = 1;
        result = prime * result + id;
        result = (int) (prime * result + money);
        result = prime * result + ((name == null) ? 0 :
 name.hashCode());
        return result;
    }
    @Override
    public boolean equals(Object obj) {
        if (this == obj)
            return true;
        if (obj == null)
            return false;
        if (getClass() != obj.getClass())
            return false;
        Customer other = (Customer) obj;
        if (id != other.id)
            return false;
        if (money != other.money)
            return false;
        if (name == null) {
            if (other.name != null)
                return false;
        } else if (!name.equals(other.name))
            return false;
        return true;
    }
    @Override
	public String toString() {
		return "User [id=" + id + ", name=" + name + ", money="
+ money + "]";
	}
	public int getId() {
		return id;
	}
	public void setId(int id) {
		this.id = id;
	}
	public String getName() {
		return name;
	}
	public void setName(String name) {
		this.name = name;
	}
	public double getMoney() {
		return money;
	}
	public void setMoney(double d) {
		this.money = d;
	}
	public DiskBook getNote() {
		return note;
	}
	public void setNote(DiskBook note) {
		this.note = note;
	}

}
```

CustomerBook.java

```
package disk;

public class CustomerBook {
	private Customer[] data = new Customer[1000];
	public boolean addCustomer(Customer u) {
		if(data[u.id]!=null)
		{
          System.out.println("This id already linked to a
customer");
          return false;
      }
      else
      {
          data[u.id] = u;
          System.out.println("Add successfully");
          return true;
      }

  }
  public Customer findCustomer(int id) {

          return data[id];

  }
  public void removeCustomer(int id) {
      if(data[id]!=null)
      {
          data[id]=null;
          System.out.println("remove successfully");

      }
      else
      {
          System.out.println("this customer does not exist");
      }

  }
  public void print() {

  }
  @Override
  public String toString() {
      String result = "";
      for (Customer customer : data) {
          result += customer+"\n";
      }
      return result;
  }
  public void peekCustomerId(String name) {
      boolean match=false;
      for (Customer customer : data) {
          if(customer!=null)
          if(name.equals(customer.getName()))
          {
              match=true;
                  System.out.println("this customer's id
is"+customer.id);
          }
      }
      if(match==false)
      {
          System.out.println("this customer does not exist");
      }
  }
  public int getCustomerId(String name) {
      int id=-1;
      for (Customer customer : data) {
          if(customer!=null)
          if(name.equals(customer.getName()))
          {
              id=customer.getId();

          }
      }
          return id;
  }
  public void setCustomer(Customer customer)
  {
      data[customer.getId()]=customer;
  }
}
```