GIT Department of Computer Engineering

CSE 222/505 - Spring 2020

Homework 1 – Part 2 Report

ŞEYDA ÖZER

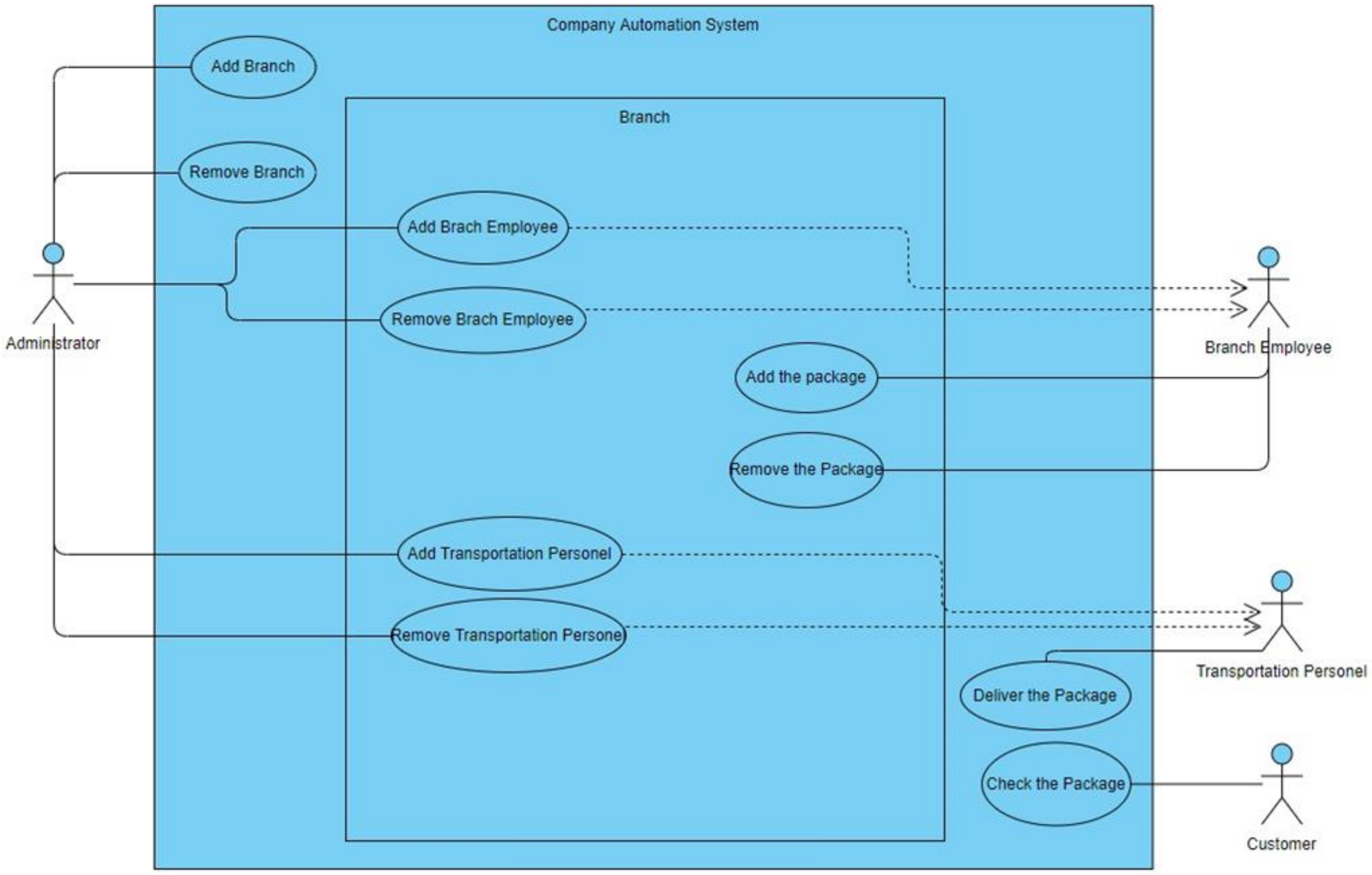
171044023

SYSTEM REQUIREMENTS

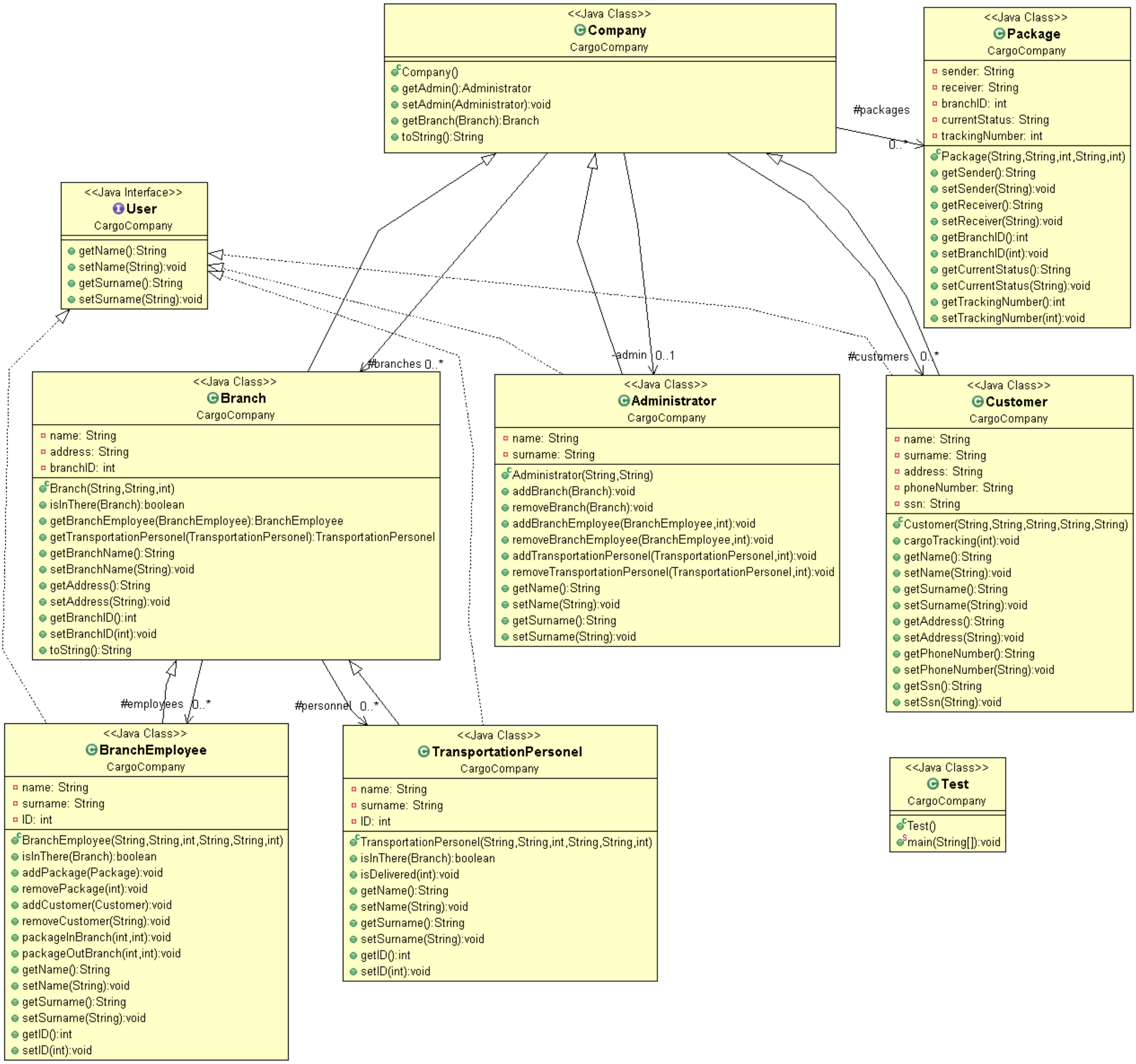
In this assignment, we design and implement the automation system for a cargo company. Users in the automation system are administrators, branch employees, transportation personnel and customers. These administrators can add and remove branches, branch employees, tranportation personnel. When customers entered the system with tracking number, only they see the receiver, sender and current status of the package. This package can added to the system by branch employee and this can removed. When a package is delivered, the transportation personel enters the system and update its current status.

Firstly, there is a need for a interface for the users. This interface should include getter and setter for the user's name and surname. Also there is a need for a class that is more general than others for the company 's data. This class named Company has informations about packages, customers, branches. These branches in the company have branches employees and transportation personnel. Administrators manage these branches and their employees. So, there is a class is needed. This administrator class should include administrator's individual data, and some methods that adding and removing the branches, branch employees and transportation personnel. Since branches need to keep branch employee’s and transportation personel’s datas, a class called branch is needed. A branch employee can adding and removing packages and customers so, a class is need for branch employe. In this class, branch employee adds package to company and enters the system its informations. There is also a need for a class for transportation personel's system update task and him/his personal information. Customers should have a social security number because it can be confusing. There is a need a class for customer’s social security and their other informations and this class have a method that take a tracking number and give informations of the package. It seems that the information of the package should be kept in a class that is called package. In this case, this automation system have a lot of classes and it have connections between these classes.

USE CASE DIAGRAMS



CLASS DIAGRAMS



<<Java Class>>
Company
CargoCompany

Company()
getAdmin():Administrator
setAdmin(Administrator):void
getBranch(Branch):Branch
toString():String

<<Java Class>>
Package
CargoCompany

sender: String
receiver: String
branchID: int
currentStatus: String
trackingNumber: int

Package(String,String,int,String,int)
getSender():String
setSender(String):void
getReceiver():String
setReceiver(String):void
getBranchID():int
setBranchID(int):void
getCurrentStatus():String
setCurrentStatus(String):void
getTrackingNumber():int
setTrackingNumber(int):void

<<Java Interface>>
User
CargoCompany

getName():String
setName(String):void
getSurname():String
setSurname(String):void

<<Java Class>>
Branch
CargoCompany

name: String
address: String
branchID: int

Branch(String,String,int)
isInThere(Branch):boolean
getBranchEmployee(BranchEmployee):BranchEmployee
getTransportationPersonel(TransportationPersonel):TransportationPersonel
getBranchName():String
setBranchName(String):void
getAddress():String
setAddress(String):void
getBranchID():int
setBranchID(int):void
toString():String

<<Java Class>>
Administrator
CargoCompany

name: String
surname: String

Administrator(String,String)
addBranch(Branch):void
removeBranch(Branch):void
addBranchEmployee(BranchEmployee,int):void
removeBranchEmployee(BranchEmployee,int):void
addTransportationPersonel(TransportationPersonel,int):void
removeTransportationPersonel(TransportationPersonel,int):void
getName():String
setName(String):void
getSurname():String
setSurname(String):void

<<Java Class>>
Customer
CargoCompany

name: String
surname: String
address: String
phoneNumber: String
ssn: String

Customer(String,String,String,String,String)
cargoTracking(int):void
getName():String
setName(String):void
getSurname():String
setSurname(String):void
getAddress():String
setAddress(String):void
getPhoneNumber():String
setPhoneNumber(String):void
getSsn():String
setSsn(String):void

<<Java Class>>
BranchEmployee
CargoCompany

name: String
surname: String
ID: int

BranchEmployee(String,String,int,String,String,int)
isInThere(Branch):boolean
addPackage(Package):void
removePackage(int):void
addCustomer(Customer):void
removeCustomer(String):void
packageInBranch(int,int):void
packageOutBranch(int,int):void
getName():String
setName(String):void
getSurname():String
setSurname(String):void
getID():int
setID(int):void

<<Java Class>>
TransportationPersonel
CargoCompany

name: String
surname: String
ID: int

TransportationPersonel(String,String,int,String,String,int)
isInThere(Branch):boolean
isDelivered(int):void
getName():String
setName(String):void
getSurname():String
setSurname(String):void
getID():int
setID(int):void

<<Java Class>>
Test
CargoCompany

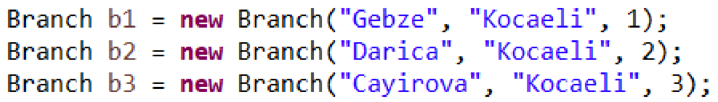
Test()
main(String[]):void

PROBLEM SOLUTION APPROACH

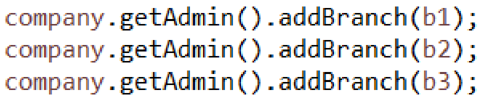
Firstly, I created an User interface. This interface include getter and setter for the user's name and surname. I will use the interface for administrators, branch employees, transportation personnel and customers later. Then I created a Company class. I decide to put the branch array, customer array, package array and a administrator into Company class. I needed the Branch class, Customer class, Package class and Administrator class for these data. I created the first Package class among these classes. I set the fields for Package class as a sender, a receiver, a ID of the branch where package is located, current status and tracking number. Then I started creating Branch class. I have determined the fields of Branch class as the name, address, ID, branch employee array and transportation personnel array. So I had to create two classes again. These classes are BranchEmployee and TransportationPersonel. I implemented the User interface for these classes. In BranchEmployee class and TranportationPersonel class, I kept the name, surname and ID of a branch employee. Later I created Administrator class and implemented the User interface for this class. Fields of the Administrator class are the name and the surname. I created methods for adding and removing a branch to the array of Branch in Company class. Then I created methods for adding and removing a branch employee to the array of BranchEmployee in a Branch(one of branches in Company class). I did also same operation for transportation personel. I added methods like addingCustomer and removingCustomer to the BranchEmployee class for customer related tasks. I added also same methods for packages tasks. I also added methods for update current status of the package about this package arriving at the branch or leaving the branch. I created a method for TransportationPersonel class and this method updates the current status of the package, when the package is delivered. I used keyword static for the arrays of Company class because I want all Company class objects to use the same array. Then I created Customer class and implemented the User interface again. I decided to fields of Customer class should be the name, surname, phone number, address and social security number. I created a method for Customer class. This method shows the information about the package with tracking number to customer. Finally, I added getters and setters to my classes.

TEST CASES

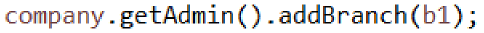
Test Case 1: adding the same branch in the company again.



```java
Branch b1 = new Branch("Gebze", "Kocaeli", 1);
Branch b2 = new Branch("Darica", "Kocaeli", 2);
Branch b3 = new Branch("Cayirova", "Kocaeli", 3);
```

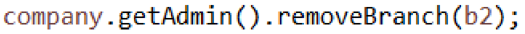


```java
company.getAdmin().addBranch(b1);
company.getAdmin().addBranch(b2);
company.getAdmin().addBranch(b3);
```

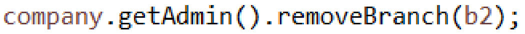


```java
company.getAdmin().addBranch(b1);
```

Test Case 2: removing a branch that is not in the company.

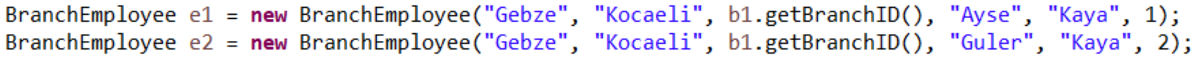


```java
company.getAdmin().removeBranch(b2);
```

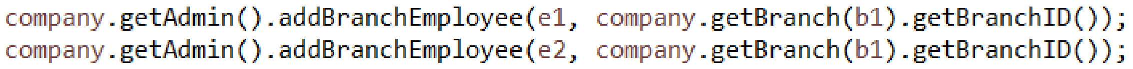


```java
company.getAdmin().removeBranch(b2);
```

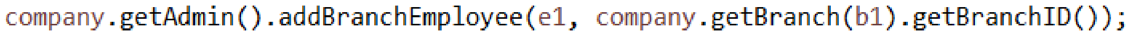
Test Case 3: adding the same branch employee in the same branch again.



```java
BranchEmployee e1 = new BranchEmployee("Gebze", "Kocaeli", b1.getBranchID(), "Ayse", "Kaya", 1);
BranchEmployee e2 = new BranchEmployee("Gebze", "Kocaeli", b1.getBranchID(), "Guler", "Kaya", 2);
```

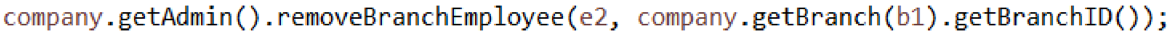


```java
company.getAdmin().addBranchEmployee(e1, company.getBranch(b1).getBranchID());
company.getAdmin().addBranchEmployee(e2, company.getBranch(b1).getBranchID());
```

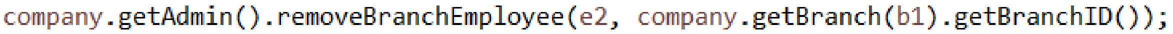


```java
company.getAdmin().addBranchEmployee(e1, company.getBranch(b1).getBranchID());
```

Test Case 4: removing a branch employee that is not in the branch.

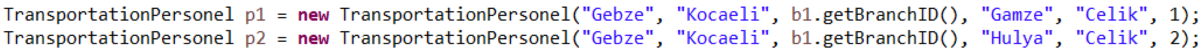


```java
company.getAdmin().removeBranchEmployee(e2, company.getBranch(b1).getBranchID());
```

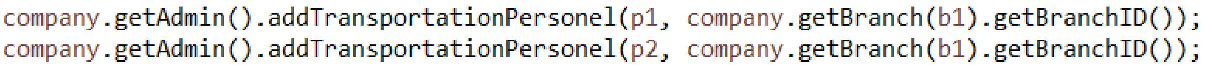


```java
company.getAdmin().removeBranchEmployee(e2, company.getBranch(b1).getBranchID());
```

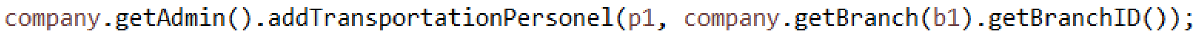
Test Case 5: adding the same transportation personel in the same branch again.



```java
TransportationPersonel p1 = new TransportationPersonel("Gebze", "Kocaeli", b1.getBranchID(), "Gamze", "Celik", 1);
TransportationPersonel p2 = new TransportationPersonel("Gebze", "Kocaeli", b1.getBranchID(), "Hulya", "Celik", 2);
```

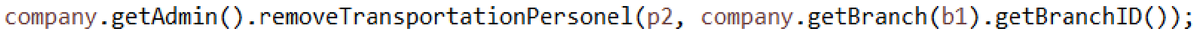


```java
company.getAdmin().addTransportationPersonel(p1, company.getBranch(b1).getBranchID());
company.getAdmin().addTransportationPersonel(p2, company.getBranch(b1).getBranchID());
```

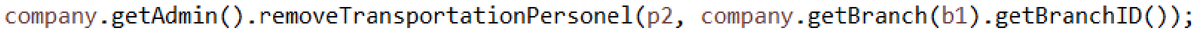


```java
company.getAdmin().addTransportationPersonel(p1, company.getBranch(b1).getBranchID());
```

Test Case 6: removing a transportation personel that is not in the branch.

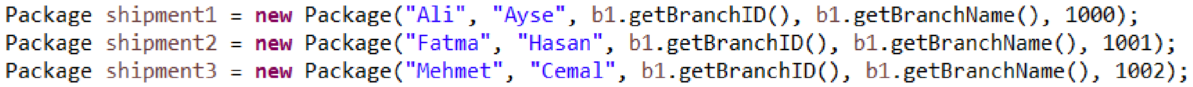


```java
company.getAdmin().removeTransportationPersonel(p2, company.getBranch(b1).getBranchID());
```

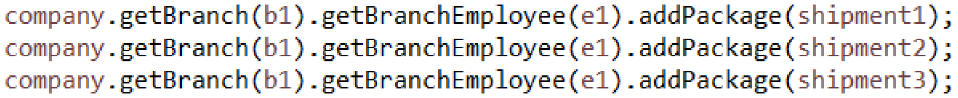


```java
company.getAdmin().removeTransportationPersonel(p2, company.getBranch(b1).getBranchID());
```

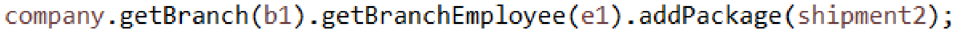
Test Case 7: adding the same package in the company again.



```
Package shipment1 = new Package("Ali", "Ayse", b1.getBranchID(), b1.getBranchName(), 1000);
Package shipment2 = new Package("Fatma", "Hasan", b1.getBranchID(), b1.getBranchName(), 1001);
Package shipment3 = new Package("Mehmet", "Cemal", b1.getBranchID(), b1.getBranchName(), 1002);
```

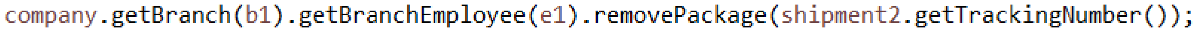


```
company.getBranch(b1).getBranchEmployee(e1).addPackage(shipment1);
company.getBranch(b1).getBranchEmployee(e1).addPackage(shipment2);
company.getBranch(b1).getBranchEmployee(e1).addPackage(shipment3);
```

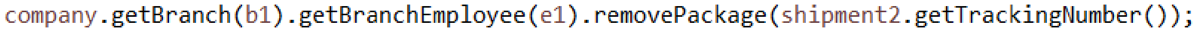


```
company.getBranch(b1).getBranchEmployee(e1).addPackage(shipment2);
```

Test Case 8: removing a package that is not in the company.

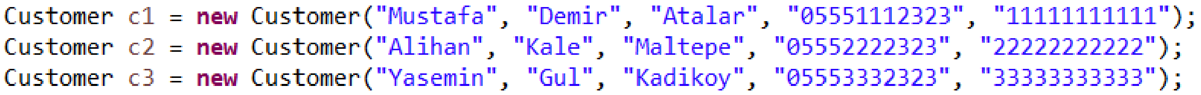


```
company.getBranch(b1).getBranchEmployee(e1).removePackage(shipment2.getTrackingNumber());
```

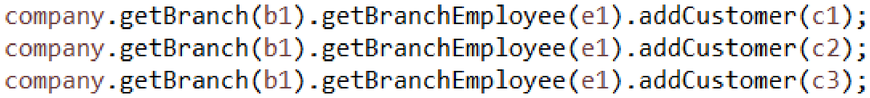


```
company.getBranch(b1).getBranchEmployee(e1).removePackage(shipment2.getTrackingNumber());
```

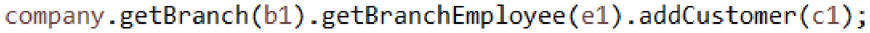
Test Case 9: adding the same customer in the company again.



```
Customer c1 = new Customer("Mustafa", "Demir", "Atalar", "05551112323", "11111111111");
Customer c2 = new Customer("Alihan", "Kale", "Maltepe", "05552222323", "22222222222");
Customer c3 = new Customer("Yasemin", "Gul", "Kadikoy", "05553332323", "33333333333");
```

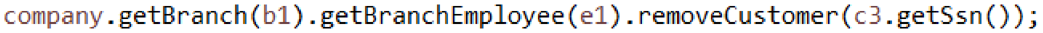


```
company.getBranch(b1).getBranchEmployee(e1).addCustomer(c1);
company.getBranch(b1).getBranchEmployee(e1).addCustomer(c2);
company.getBranch(b1).getBranchEmployee(e1).addCustomer(c3);
```

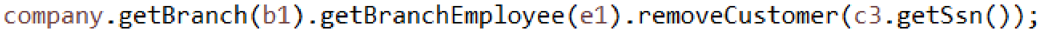


```
company.getBranch(b1).getBranchEmployee(e1).addCustomer(c1);
```

Test Case 10: removing a customer that is not in the company.

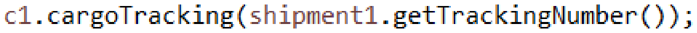


```
company.getBranch(b1).getBranchEmployee(e1).removeCustomer(c3.getSsn());
```

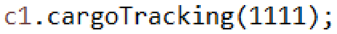


```
company.getBranch(b1).getBranchEmployee(e1).removeCustomer(c3.getSsn());
```

Test Case 11: trying to look at the information of the package with an invalid tracking number.

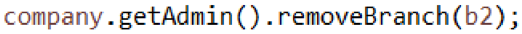


```
c1.cargoTracking(shipment1.getTrackingNumber());
```

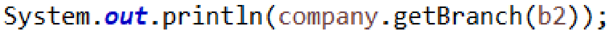


```
c1.cargoTracking(1111);
```

Test Case 12: trying to run on a branch that does not exist in the company

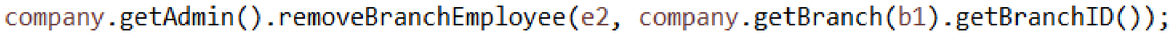


```
company.getAdmin().removeBranch(b2);
```

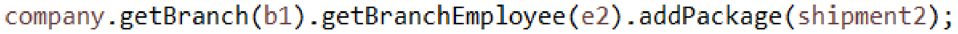


```
System.out.println(company.getBranch(b2));
```

Test Case 13: trying to enter the system with a wrong branch employee.

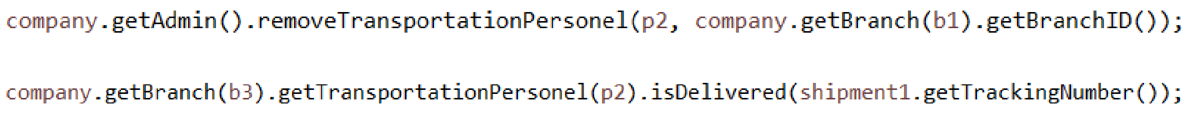


```
company.getAdmin().removeBranchEmployee(e2, company.getBranch(b1).getBranchID());
```



```
company.getBranch(b1).getBranchEmployee(e2).addPackage(shipment2);
```

Test Case 14: trying to enter the system with a wrong transportation personel.

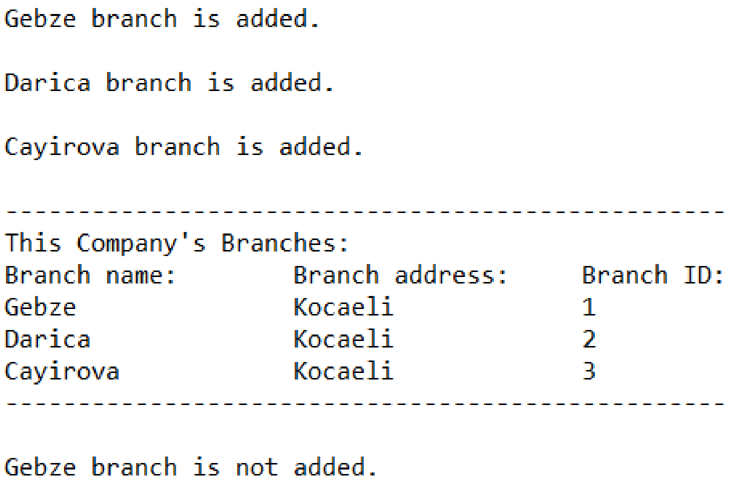


```
company.getAdmin().removeTransportationPersonel(p2, company.getBranch(b1).getBranchID());

company.getBranch(b3).getTransportationPersonel(p2).isDelivered(shipment1.getTrackingNumber());
```

RUNNİNG AND RESULTS

Test Case 1:

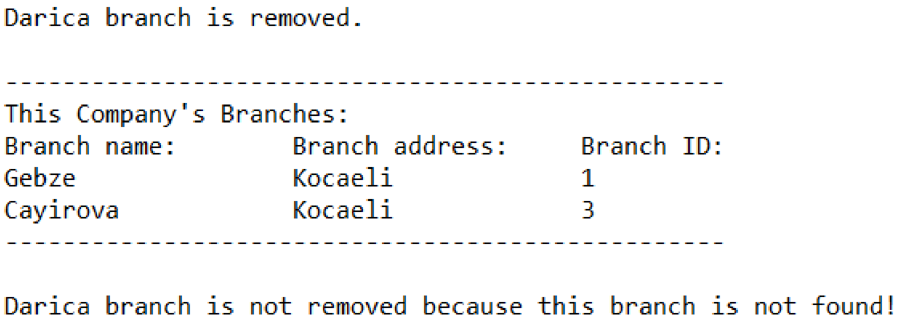
I added Gebze, Darica and Cayirova as a branch and I try to add Gebze again.



```
Gebze branch is added.

Darica branch is added.

Cayirova branch is added.

--------------------------------------------------
This Company's Branches:
Branch name:        Branch address:     Branch ID:
Gebze               Kocaeli             1
Darica              Kocaeli             2
Cayirova            Kocaeli             3
--------------------------------------------------

Gebze branch is not added.
```

Test Case 2:

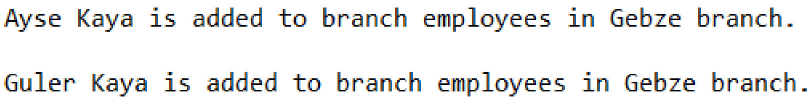
I try to remove a branch two times.



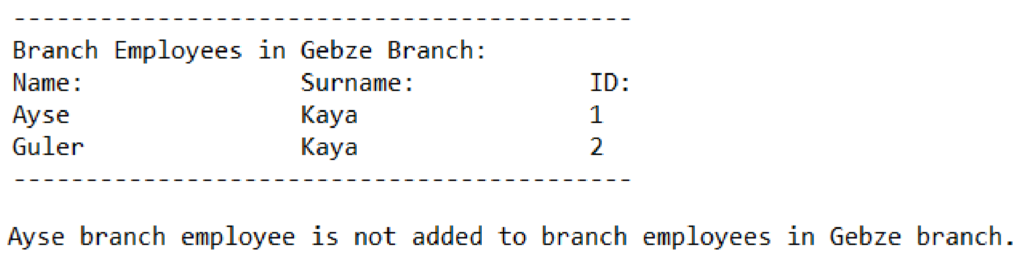
```
Darica branch is removed.

--------------------------------------------------
This Company's Branches:
Branch name:        Branch address:     Branch ID:
Gebze               Kocaeli             1
Cayirova            Kocaeli             3
--------------------------------------------------

Darica branch is not removed because this branch is not found!
```

Test Case 3:

I added Ayse and Guler as a branch employee and I try to add Ayse again.



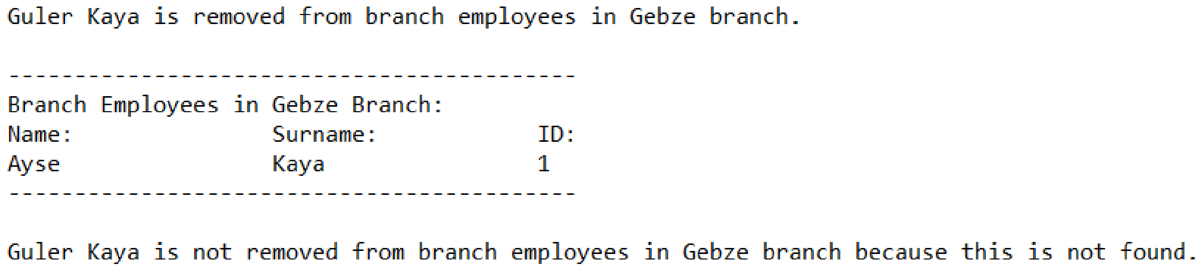
```
Ayse Kaya is added to branch employees in Gebze branch.

Guler Kaya is added to branch employees in Gebze branch.
```



```
-------------------------------------------
Branch Employees in Gebze Branch:
Name:                Surname:            ID:
Ayse                 Kaya                1
Guler                Kaya                2
-------------------------------------------

Ayse branch employee is not added to branch employees in Gebze branch.
```

Test Case 4:

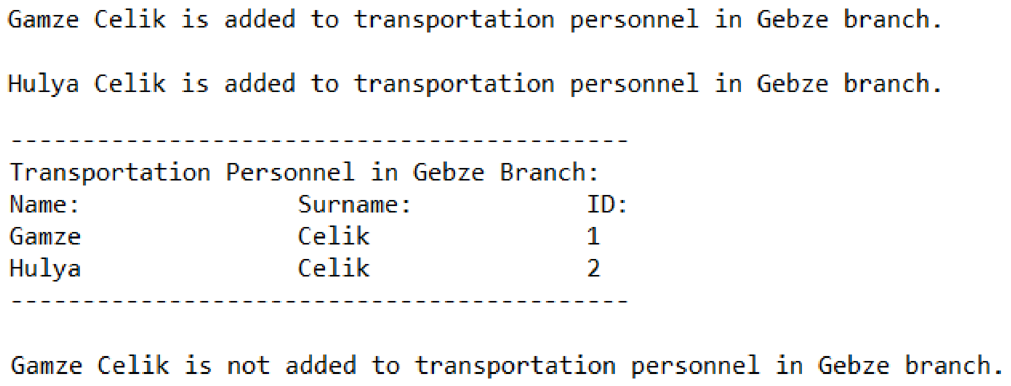
I try to remove a branch employee two times.



```
Guler Kaya is removed from branch employees in Gebze branch.

-------------------------------------------
Branch Employees in Gebze Branch:
Name:                Surname:            ID:
Ayse                 Kaya                1
-------------------------------------------

Guler Kaya is not removed from branch employees in Gebze branch because this is not found.
```

Test Case 5:

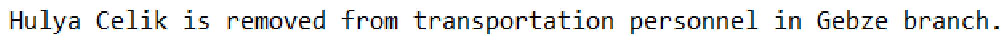
I added Gamze and Hulya as a transportation personel and I try to add Gamze again.



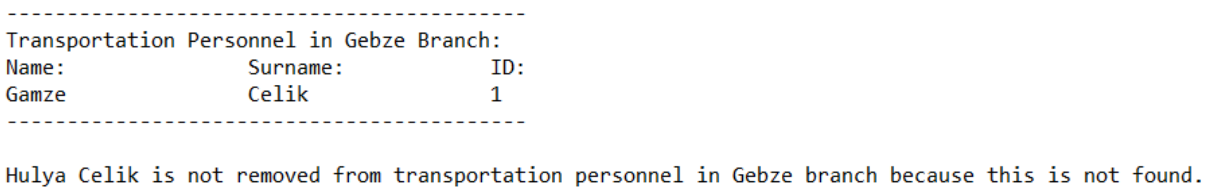
```
Gamze Celik is added to transportation personnel in Gebze branch.

Hulya Celik is added to transportation personnel in Gebze branch.

-------------------------------------------
Transportation Personnel in Gebze Branch:
Name:                Surname:            ID:
Gamze                Celik               1
Hulya                Celik               2
-------------------------------------------

Gamze Celik is not added to transportation personnel in Gebze branch.
```

Test Case 6:

I try to remove a transportation personel two times.



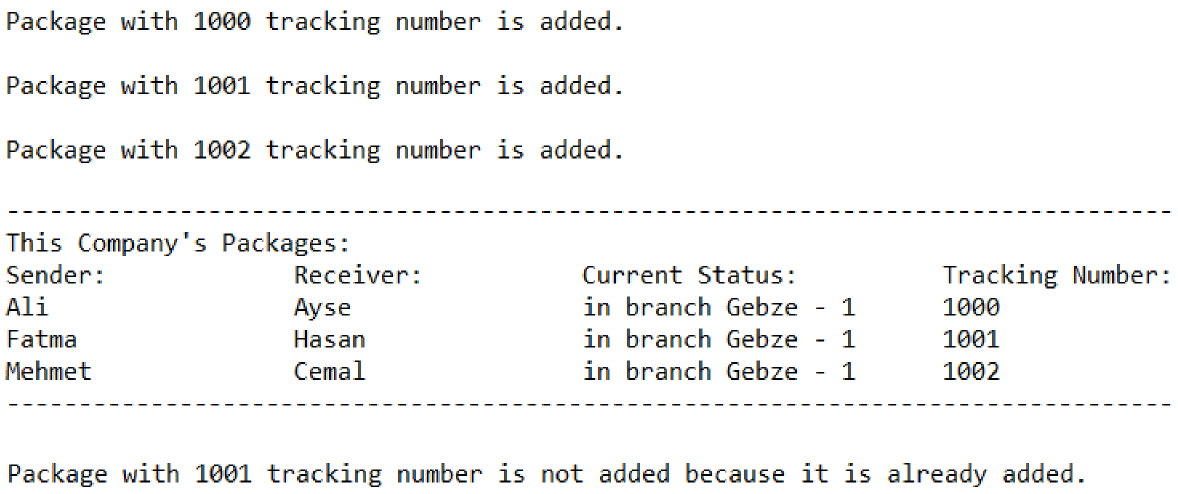
```
Hulya Celik is removed from transportation personnel in Gebze branch.
```



```
-------------------------------------------
Transportation Personnel in Gebze Branch:
Name:                Surname:            ID:
Gamze                Celik               1
-------------------------------------------

Hulya Celik is not removed from transportation personnel in Gebze branch because this is not found.
```

Test Case 7:

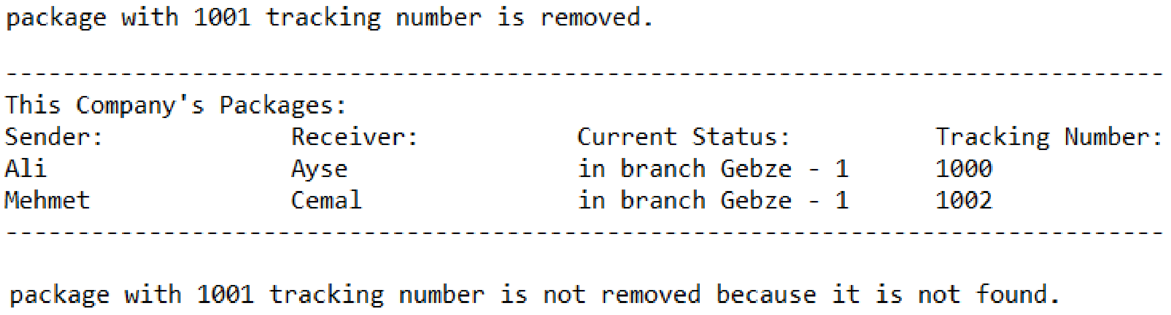
I added the packages with 1000, 1001 and 1002 tracking numbers and I try to add 1001 again.



```
Package with 1000 tracking number is added.

Package with 1001 tracking number is added.

Package with 1002 tracking number is added.

-------------------------------------------------------------------------------
This Company's Packages:
Sender:             Receiver:           Current Status:         Tracking Number:
Ali                 Ayse                in branch Gebze - 1     1000
Fatma               Hasan               in branch Gebze - 1     1001
Mehmet              Cemal               in branch Gebze - 1     1002
-------------------------------------------------------------------------------

Package with 1001 tracking number is not added because it is already added.
```

Test Case 8:

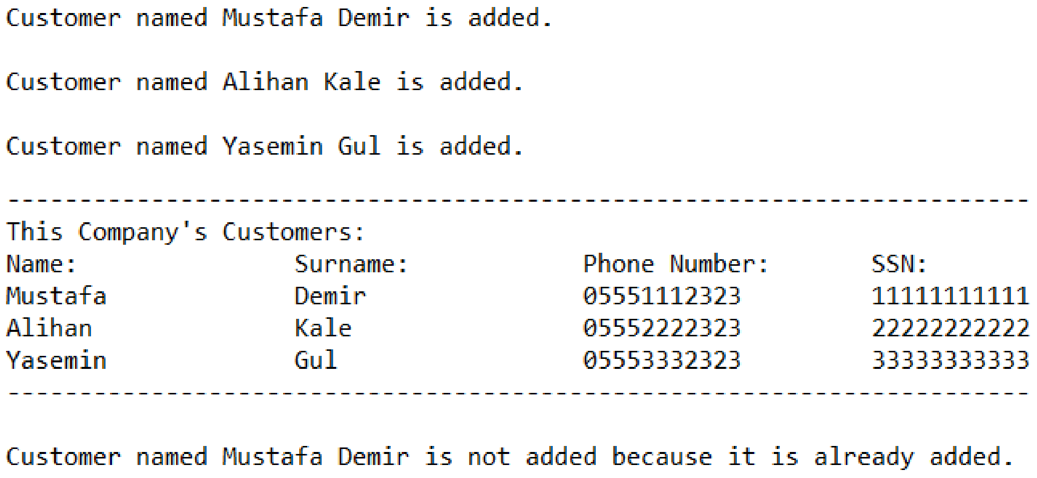
I try to remove a package two times.



```
package with 1001 tracking number is removed.

-------------------------------------------------------------------------------
This Company's Packages:
Sender:             Receiver:           Current Status:         Tracking Number:
Ali                 Ayse                in branch Gebze - 1     1000
Mehmet              Cemal               in branch Gebze - 1     1002
-------------------------------------------------------------------------------

package with 1001 tracking number is not removed because it is not found.
```

Test Case 9:

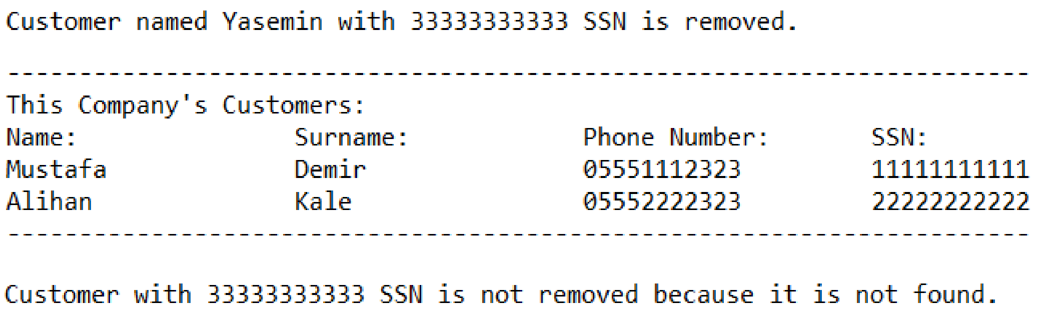
I added Mustafa, Alihan and Yasemin as a customers and I try to add Yasemin again.



```
Customer named Mustafa Demir is added.

Customer named Alihan Kale is added.

Customer named Yasemin Gul is added.

----------------------------------------------------------------------
This Company's Customers:
Name:               Surname:            Phone Number:       SSN:
Mustafa             Demir               05551112323         11111111111
Alihan              Kale                05552222323         22222222222
Yasemin             Gul                 05553332323         33333333333
----------------------------------------------------------------------

Customer named Mustafa Demir is not added because it is already added.
```

Test Case 10:

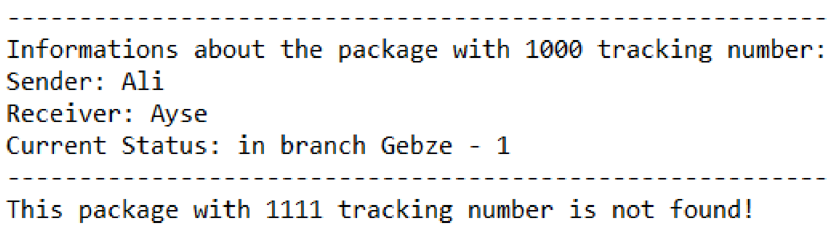
I try to remove a customer two times.



```
Customer named Yasemin with 33333333333 SSN is removed.

-----------------------------------------------------------------------
This Company's Customers:
Name:               Surname:            Phone Number:       SSN:
Mustafa             Demir               05551112323         11111111111
Alihan              Kale                05552222323         22222222222
-----------------------------------------------------------------------

Customer with 33333333333 SSN is not removed because it is not found.
```

Test Case 11:

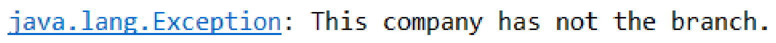
Entering the valid and invalid tracking number



```
---------------------------------------------------------
Informations about the package with 1000 tracking number:
Sender: Ali
Receiver: Ayse
Current Status: in branch Gebze - 1
---------------------------------------------------------
This package with 1111 tracking number is not found!
```

Test Case 12:

Branch b2 is removed, so this branch is not used.

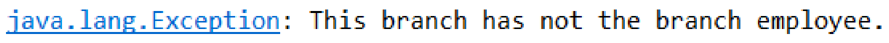


```
java.lang.Exception: This company has not the branch.
```

Test Case 13:

Entering the system with a wrong branch employee

Branch employee e2 is removed before this operation.

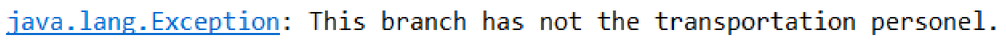


```
java.lang.Exception: This branch has not the branch employee.
```

Test Case 14:

Entering the system with a wrong transportation personel

Transportation personel p2 is removed before this operation.



```
java.lang.Exception: This branch has not the transportation personel.
```