National University of Computer and Emerging Sciences

- FAST Computer Science Department

Fundaments of Software Engineering
CS-2004

Assignment 03:

Submitted to:

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Submitted by:

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Contents

1. Use case identification:

- Login
- Register
- Book ride
- Travel details
- Check fee details
- Manage student information
- Manage finance
- Check salary
- Manage accounts
- Manage buses

After applying the three tests:

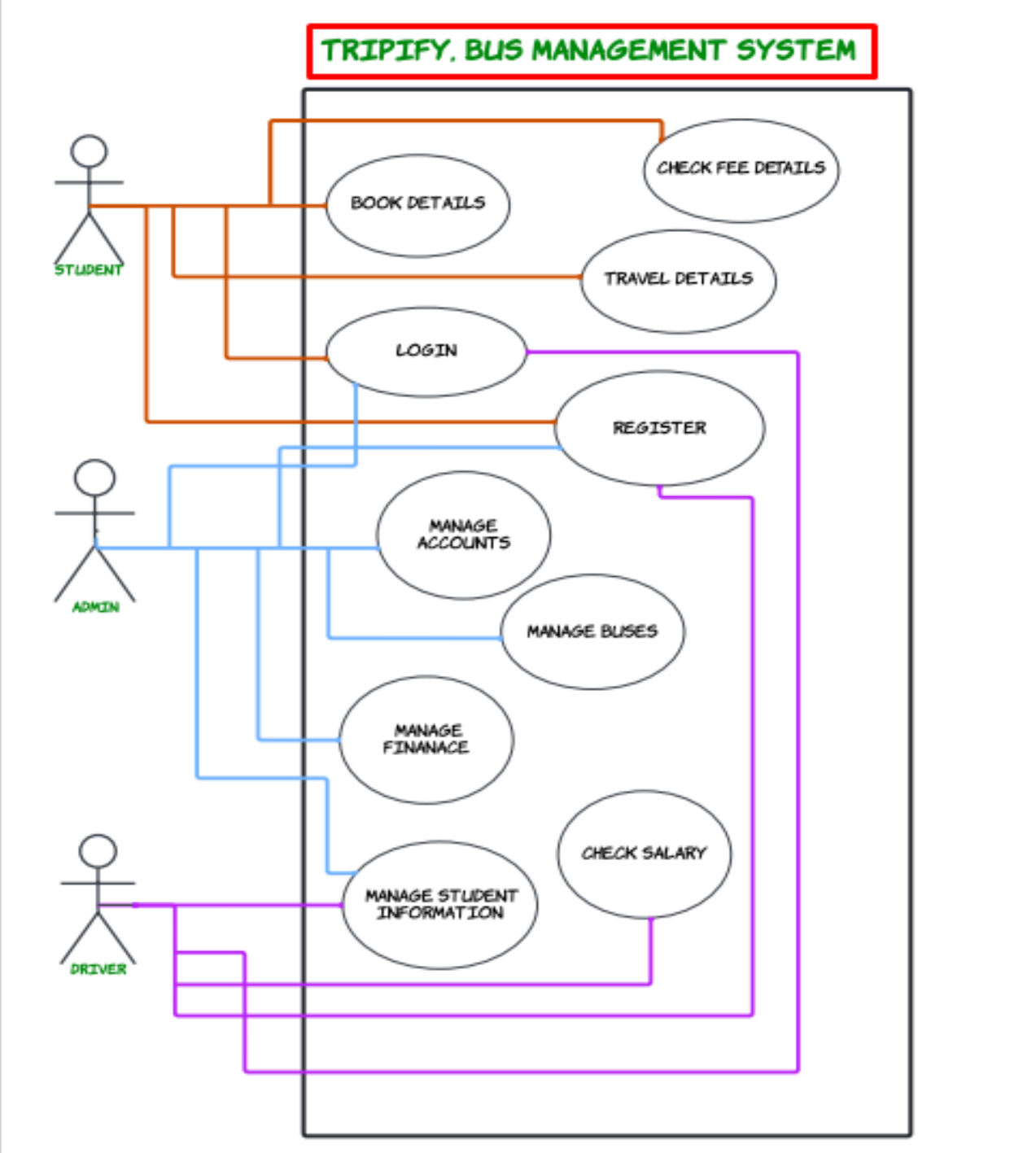
1. **Boss Test**
2. **Size Test**
3. **Elementary Business Process (EBP) Test**

The use cases were shortlisted.

The top five useful use cases are now:

- Book ride
- Manage student information
- Manage finance
- Manage accounts
- Manage buses

2. Use a case Diagram:



- Our app is a traveling app for FAST university so, the primary actors are three (student/driver/admin).
- There are no secondary actors in our use case diagram as no other actors are involved in the working of the app.

3. High-Level Use Cases:

US01:	
Use case:	Login
Actors:	Student, driver, admin
Type:	Primary
Description:	The user(student/admin/driver) wants to log in to the app to book the ride, manage the app, or check the ride status. When he/she enters the right credentials, the system allows them to use the app and perform the activity.

US02:	
Use case:	Register
Actors:	Student, driver
Type:	Primary
Description:	The student and driver would be able to register their account into the system. They would enter the required information and their account will be registered for further use.

US03:	
Use case:	Book ride
Actors:	Student
Type:	Primary
Description:	The student can book the ride. He/she should enter the required information into the system and their ride would be booked. He/ she can also redefine the path (picking point).

US04:	
Use case:	Travel details.
Actors:	Student
Type:	Primary
Description:	When the student enters the booking information, all travel information, including maps, numbers, route, driver, and bus details, will be shown to the student. After this, he could have a confirmation about his/her ride.

US05:	
Use case:	Check fee details
Actors:	Student
Type:	Primary
Description:	The student can check the status of his/her fee. If the fee is paid, he/she can book the ride else, a 2-day ultimatum would be shown to that person, or else he would not be able to book the ride.

US06:	
Use case:	Manage student information
Actors:	Driver and admin
Type:	Primary
Description:	When the student enters the information to book the ride, the booking/traveling information is stored and displayed to the driver. This way the driver has the picking points and contact information of all the same route students.

US07:	
Use case:	Manage finance
Actors:	Admin
Type:	Primary
Description:	The admin should be able to manage all the financial status, this includes the student fee, driver's salary, and the revenue. This way he can check all the money matters.

US08:	
Use case:	Check salary
Actors:	Driver
Type:	Primary
Description:	The driver logs in to the app and checks the status of his salary and whether it has been transferred to the bank or not.

US09:	
Use case:	Manage accounts
Actors:	Admin
Type:	Primary
Description:	The admin manages the accounts of drivers and students. He can either add or delete the accounts based on addition or removal.

US010:	
Use case:	Manage buses
Actors:	Admin
Type:	Primary
Description:	The admin manages the buses by having a regular reminder message for the bus service. He can also allot drivers to a particular bus with a particular route.

4. Extended Use Case:

1. Book ride scenario

Use case section	Description
Use case name: (UC01)	Book ride.
Scope	The system is under design and its application (Booking ride functionality).
Level	User goal.
Primary actor	Student
Priority	High
Stakeholders and Interests	Student: wants easy and fast booking of the daily ride to the university, without any technical errors. Admin: wants to save all the information for managing the routes. Driver: wants to have data for picking points and contact information.
Preconditions	Students must be identified and authenticated.
Postconditions	• Ride is booked • Address is saved • Travel details are displayed
Extensions	At any time, the System fails: 1a. The student must contact the admin or the numbers provided in the HELP. 2a. The student must try to close the app and log in again.
Special requirement	• Text must be visible • UI should be simple and understandable • Travel details display within 5-10 seconds • Robust recovery when booking the ride is failing.

<table>
<tr><td>Main success scenario</td><td>
<table>
<tr><th>Actor Action:</th><th>System Responsibility:</th></tr>
<tr><td>1. The student enters the required information.</td><td></td></tr>
<tr><td></td><td>2. The system checks the validation of the information, especially the picking point.
3. If the input is valid the travel details are displayed to the student.</td></tr>
<tr><td>4. The student can see all of the travel information.</td><td></td></tr>
<tr><td></td><td>5. The system sends all of the information to the admin and driver.</td></tr>
</table>
</td></tr>
<tr><td>Technology and Data Variations List</td><td>• Location entered is correctly mapped. (Location check)
• Fee status checker. (Fee receipt checker).</td></tr>
<tr><td>Frequency of occurrence</td><td>• This use case is continuous.</td></tr>
<tr><td>Miscellaneous/ Open issues</td><td>• Can the students have information about other students?
• What if the student is unable to book the ride?
• How to inform in case of any delay in bus arrival?</td></tr>
</table>

2. Manage Finance scenario

Use case section	Description
Use case name: (UC02)	Manage finance.
Scope	The system is under design and its application (finance functionality).
Level	User goal.
Primary actor	Admin
Priority	High
Stakeholders and Interests	Student: wants to check whether his/her fee has been paid or not and is updated on the app. Admin: wants to save all the financial information of students, drivers, and savings. Driver: wants to know when his salary will be available in the bank.
Preconditions	Admin must be identified and authenticated.
Postconditions	• The fee deposit information is received by the admin. • All the money information is updated from the bank. • The fee status is updated. • The salary status is updated.
Extensions	At any time, the System fails: 1a. The admin must contact the developers or the numbers provided. 2a. The admin must try to close the app and log in again. At any time, the bank doesn't respond: 1a. The admin should contact the bank directly by the provided contact information. At any time, the student doesn't deposit dee: 1a: The admin should jam the account of the student.
Special requirement	• Text must be visible • UI should be simple and understandable • The bank updates should be within 5-10 mins. • Robust recovery when bank contact is failing.

<table>
<tr><td>Main success scenario</td><td>
<table>
<tr><th>Actor Action:</th><th>System Responsibility:</th></tr>
<tr><td>2. The admin checks with the bank the fee status of students.</td><td></td></tr>
<tr><td></td><td>2. The system responds to queries made by the admin.</td></tr>
<tr><td>3. The admin gives an ultimatum to those who haven’t submitted their fee.
4. Even after the ultimatum if they have submitted the fee, the admin jams their accounts.</td><td></td></tr>
<tr><td></td><td>5. The system either gives an ultimatum to that particular student’s account or freezes the booking functionality.</td></tr>
<tr><td>6. The admin tells the system to show the salary status of drivers.</td><td></td></tr>
<tr><td></td><td>7. The system displays the salary status message.</td></tr>
</table>
</td></tr>
<tr><td>Technology and Data Variations List</td><td>Fee status checker. (Fee receipt checker).
Remote bank checking facility.</td></tr>
<tr><td>Frequency of occurrence</td><td>This use case is continuous.</td></tr>
<tr><td>Miscellaneous/ Open issues</td><td>What will the admin do if he/she cannot contact the bank?
What if the admin is not able to update the fee and salary status?</td></tr>
</table>

3. Manage Accounts scenario

Use case section	Description
Use case name: (UC03)	Manage accounts.
Scope	The system is under design and its application (account management functionality).
Level	User goal.
Primary actor	Admin
Priority	High
Stakeholders and Interests	Student: wants to register for the first time. Admin: wants to hire or fire a driver, make changes to their accounts, and delete or add the accounts of students. Driver: wants to register for the first time.
Preconditions	Admin must be identified and authenticated.
Postconditions	• The account is added. • The account is updated. • The account is deleted.
Main success scenario	**Actor Action:** 1. The admin adds a person (driver or student) and makes a default account. 3. The admin removes a person (driver or student) and deletes their account. 5. The admin wants to make changes to a person's account. **System Responsibility:** 2. The system makes the account of that person. 4. The system deletes the account of that person. 6. The system changes the account of that person.

Extensions	At any time, the System fails: 1a. The admin must contact the developer or the numbers provided in the HELP. 2a. The admin must try to close the app and re-login.
Special requirement	• Text must be visible • UI should be simple and understandable. • The admin can communicate with students/drivers. • Robust recovery when booking the ride is failing.
Frequency of occurrence	• This use case is continuous.
Miscellaneous/ Open issues	• What if the admin is not able to add/remove the account of the student/driver? • What if the admin is not able to make changes to the accounts of students/drivers?

4. Manage Bus scenario

<table>
<tr><th>Use case section</th><th>Description</th></tr>
<tr><td>Use case name: (UC04)</td><td>Manage buses.</td></tr>
<tr><td>Scope</td><td>The system is under design and its application (account management functionality).</td></tr>
<tr><td>Level</td><td>User goal.</td></tr>
<tr><td>Primary actor</td><td>Admin</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Stakeholders and Interests</td><td>Admin: wants to update the service status of the buses and every route updating and bus allotment to the drivers.
Driver: wants to know which bus and route he would be taking the next day.</td></tr>
<tr><td>Preconditions</td><td>Admin must be identified and authenticated.</td></tr>
<tr><td>Postconditions</td><td>• The drivers have been allotted to the respective busses.
• The routes of the buses have been scheduled.
• Th definite picking points are marked.</td></tr>
<tr><td>Main success scenario</td><td>
<table>
<tr><th>Actor Action:</th><th>System Responsibility:</th></tr>
<tr><td>1. The admin ask the system for all the selected route.</td><td></td></tr>
<tr><td></td><td>2. The system shows all the defined routes.</td></tr>
<tr><td>3. The admin selects all the routes and allots the driver to a specific route.</td><td></td></tr>
<tr><td></td><td>4. The system allots all the busses to the specific driver.</td></tr>
<tr><td>5. The admin wants to check the bus service status.</td><td></td></tr>
<tr><td></td><td>6. The system shows the status of all the bus service.</td></tr>
</table>
</td></tr>
</table>

Extensions	At any time, the System fails: 1a. The admin must contact the developers or the numbers provided in the HELP. 2a. The admin must try to close the app and log in again. 3a. If the routes don't get updated the admin should go with the previous schedule and then contact the developer's team.
Special requirement	• Text must be visible • UI should be simple and understandable • Buses details display within 5-10 seconds • Robust recovery when booking the ride is failing.
Technology and Data Variations List	• Location (picking points) are saved and validated. • Best communication channel possible to communicate the route details to students and drivers.
Frequency of occurrence	• This use case is continuous.
Miscellaneous/ Open issues	• Can the admin change the default routes and update them? • What will the admin do if the bus service status is not updated?

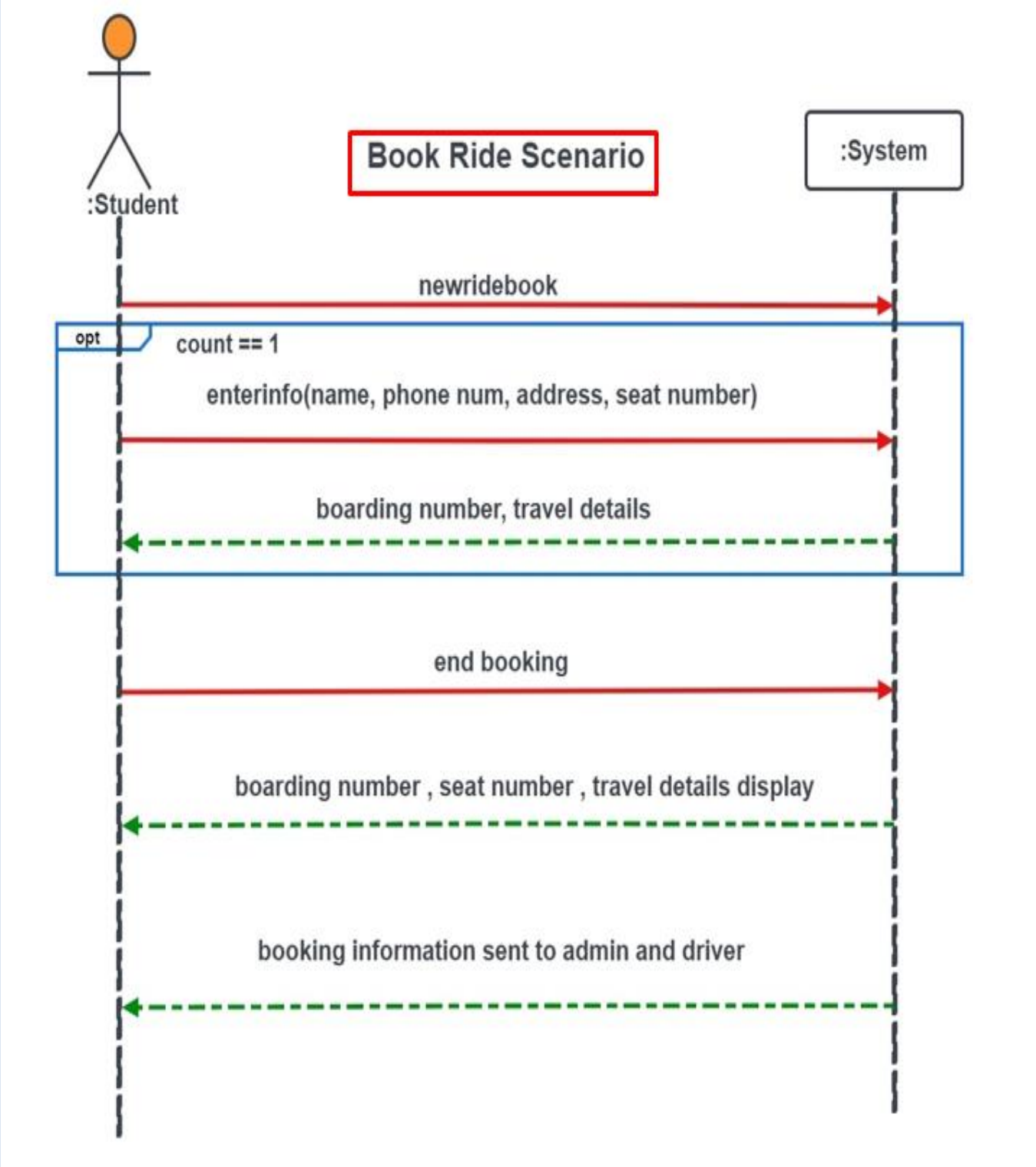
5. Travel Details scenario

Use case section	Description
Use case name: (UC05)	Travel details.
Scope	The system is under design and its application (account management functionality).
Level	Subfunction.
Primary actor	Admin, student, driver.
Priority	High
Stakeholders and Interests	Admin: wants to set the map for the route setup for the next day. Driver: wants to know which students are going to be traveling in his bus. He should have the boarding numbers, seat numbers, and contact information of all the travelers. Students: wants to see all the travel information for the next day's travels. He/she should be also able to see all of the available picking points along the route of the university.
Preconditions	Admin must be identified and authenticated.
Postconditions	• The drivers can see all of the information of the travelers. • The students can see all of the information about the next day's travel. • The admin can set the maps one night before the next day's travel.
Extensions	At any time, the System fails: 1a. The admin must contact the developers or the numbers provided in the HELP. 2a. The admin must try to close the app and log in again. 3a. If the routes don't get updated the admin should go with the previous schedule and then contact the developer's team. 4a. Check your internet connection.
Special requirement	• Text must be visible • UI should be simple and understandable • Buses details display within 5-10 seconds • Robust recovery when booking the ride is failing.

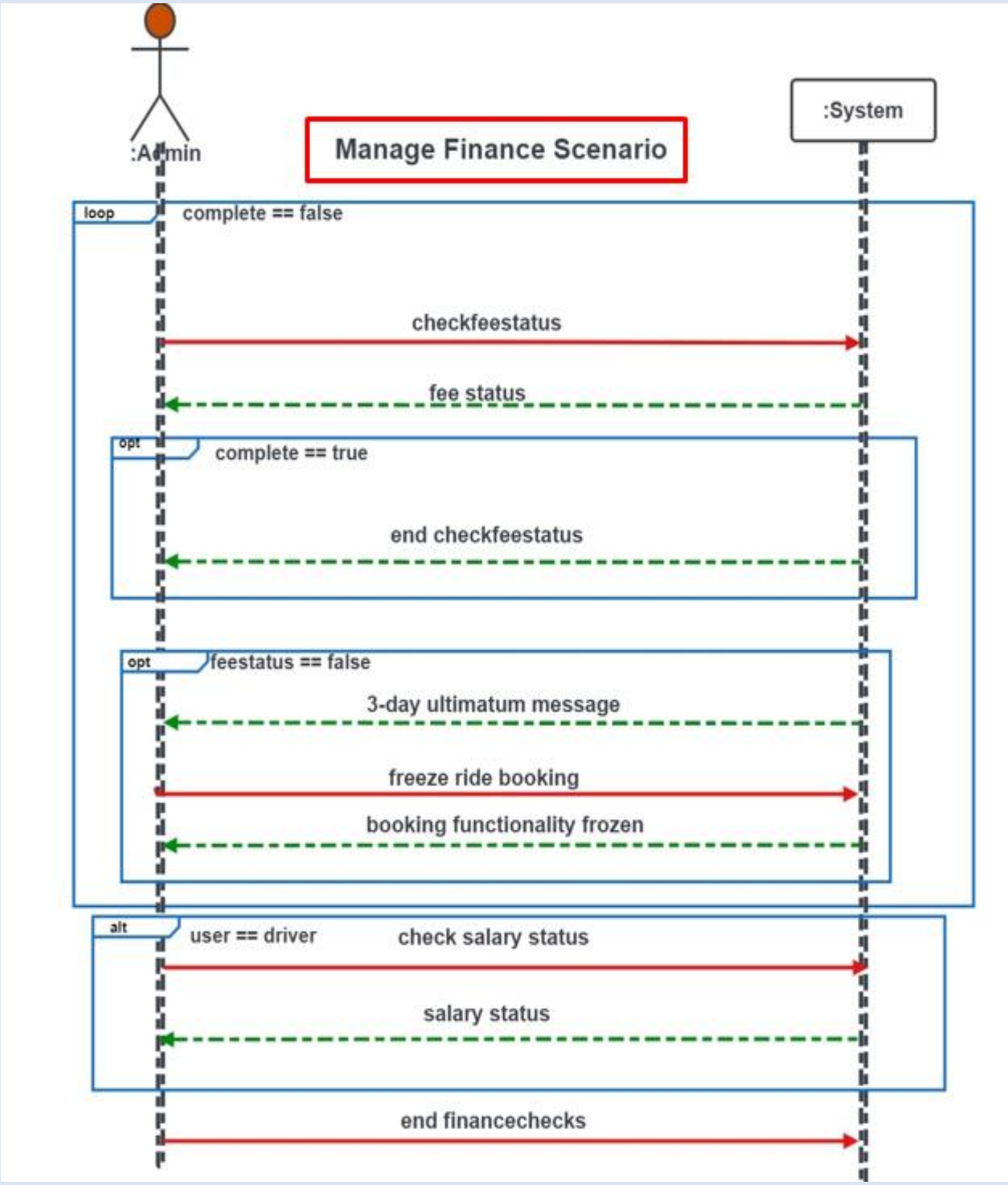
<table>
<tr><td>Main success scenario</td><td>
<table>
<tr><th>Actor Action:</th><th>System Responsibility:</th></tr>
<tr><td>1. The student enters all of the information regarding the trip.</td><td>2. The system shows all the defined routes.
3. The system sends all of the information to the driver.</td></tr>
<tr><td>4. The driver asks the system for all of the route details.</td><td>5. The system shows all of the information to the driver.
6. The system also send all of the information to the admin.</td></tr>
</table>
</td></tr>
<tr><td>Technology and Data Variations List</td><td>• Location (picking points) are saved and validated.
• Best communication channel possible to communicate the route details to students and drivers.</td></tr>
<tr><td>Frequency of occurrence</td><td>• This use case is continuous.</td></tr>
<tr><td>Miscellaneous/ Open issues</td><td>• Can the admin change the default routes and update them?
• What will the admin do if the bus service status is not updated?</td></tr>
</table>

System sequence diagrams:

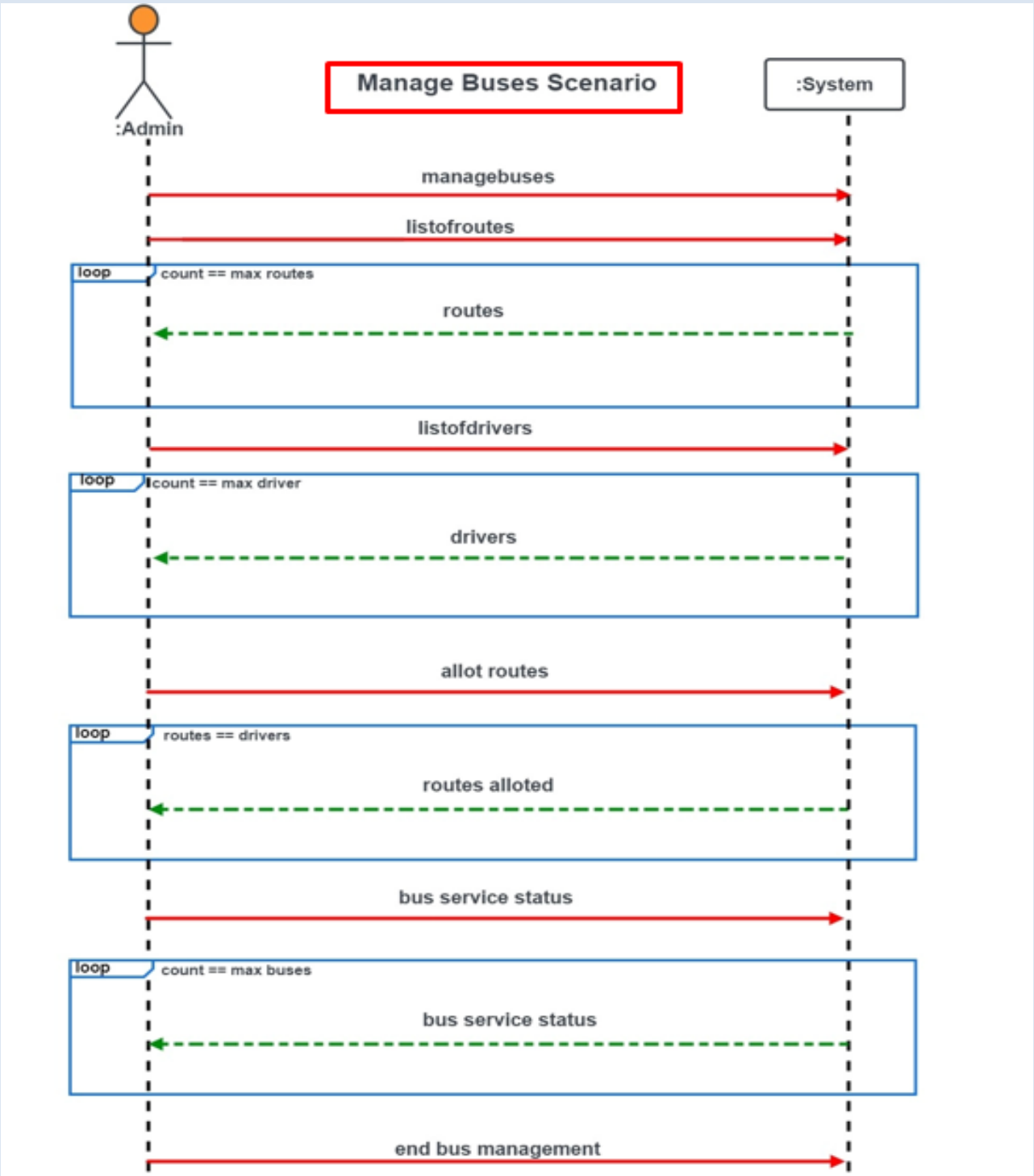
1. **Book ride scenario**



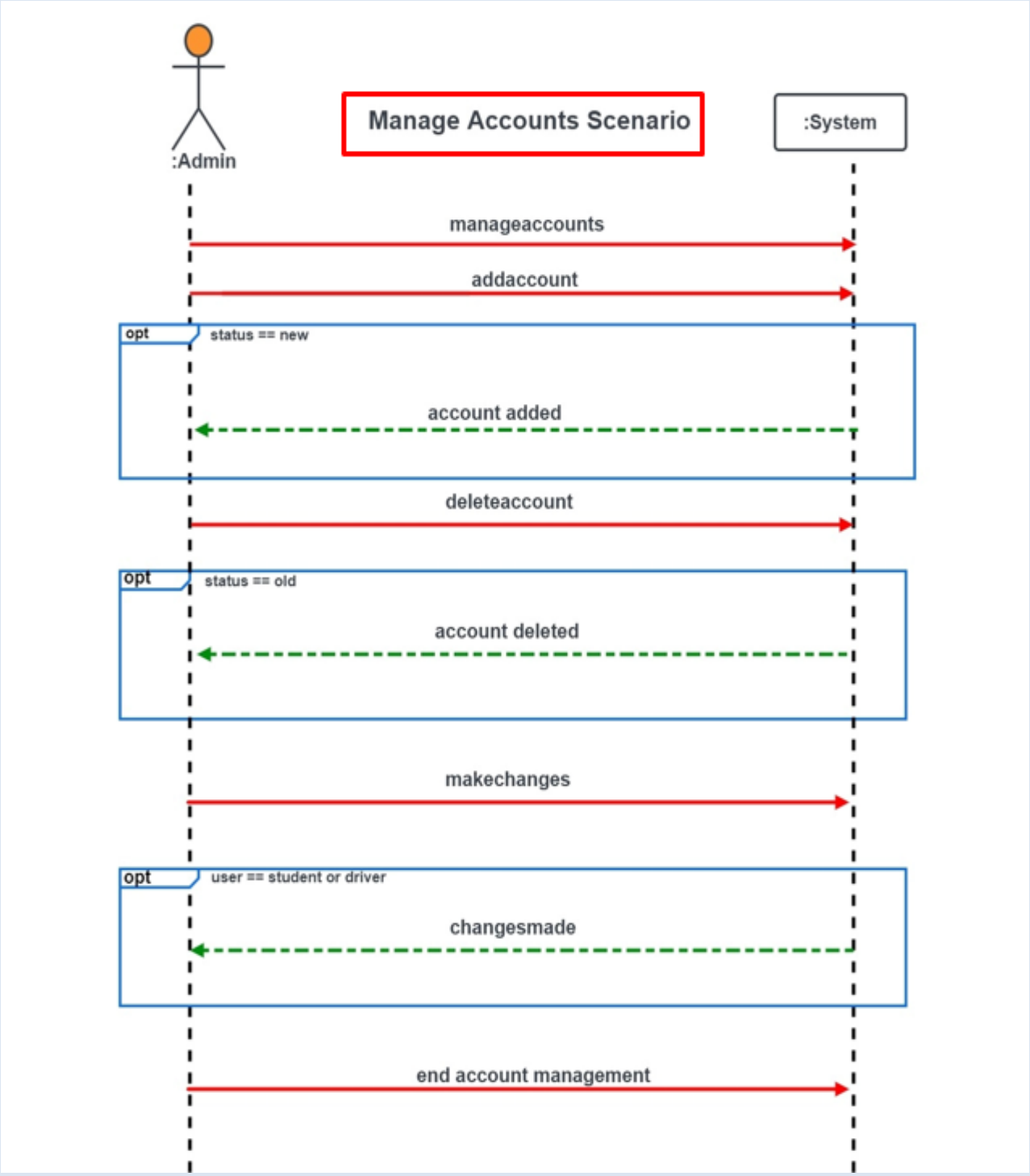
2. Manage Finance scenario



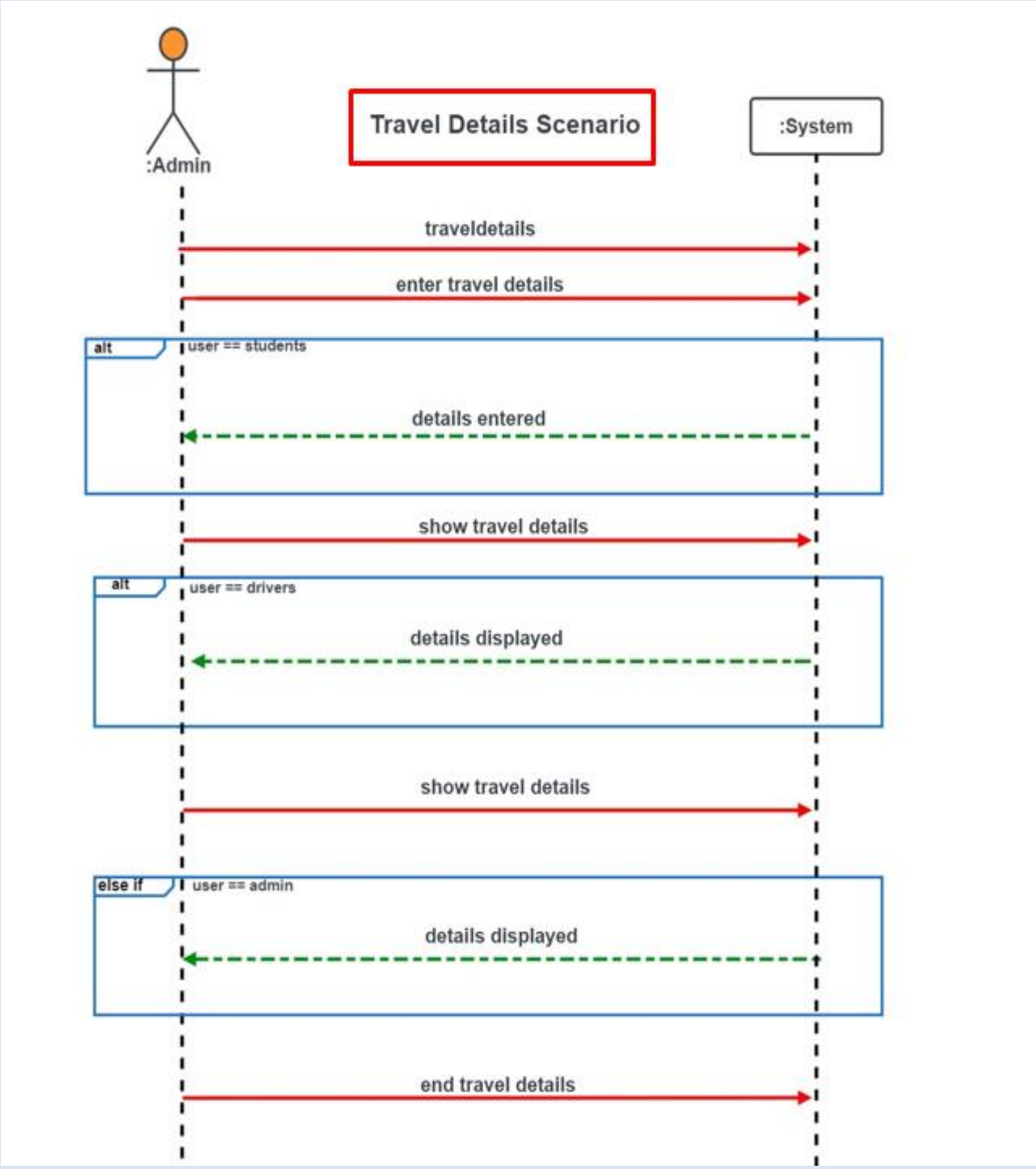
3. Manage Bus scenario



4. Manage Accounts scenario

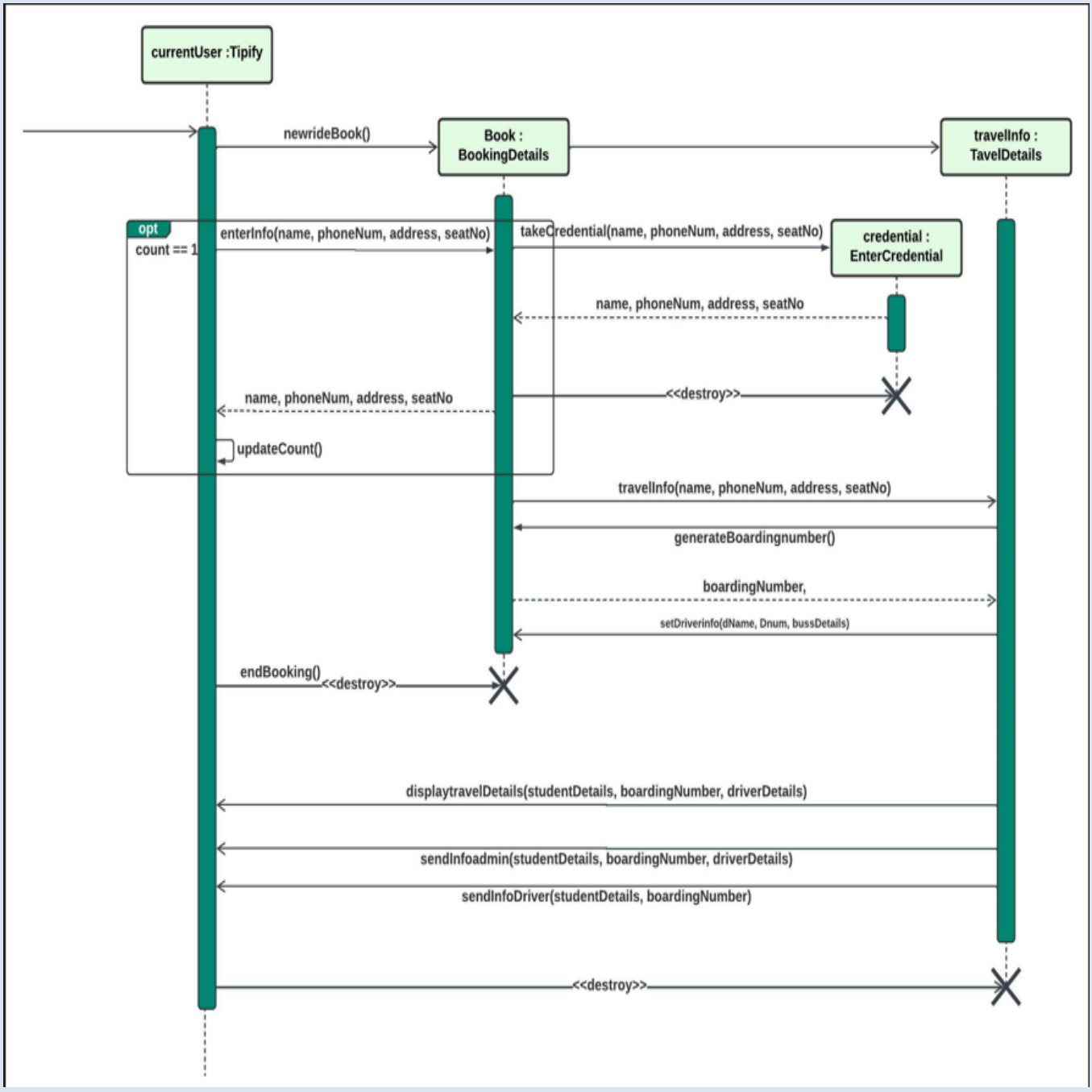


5. Travel Details scenario

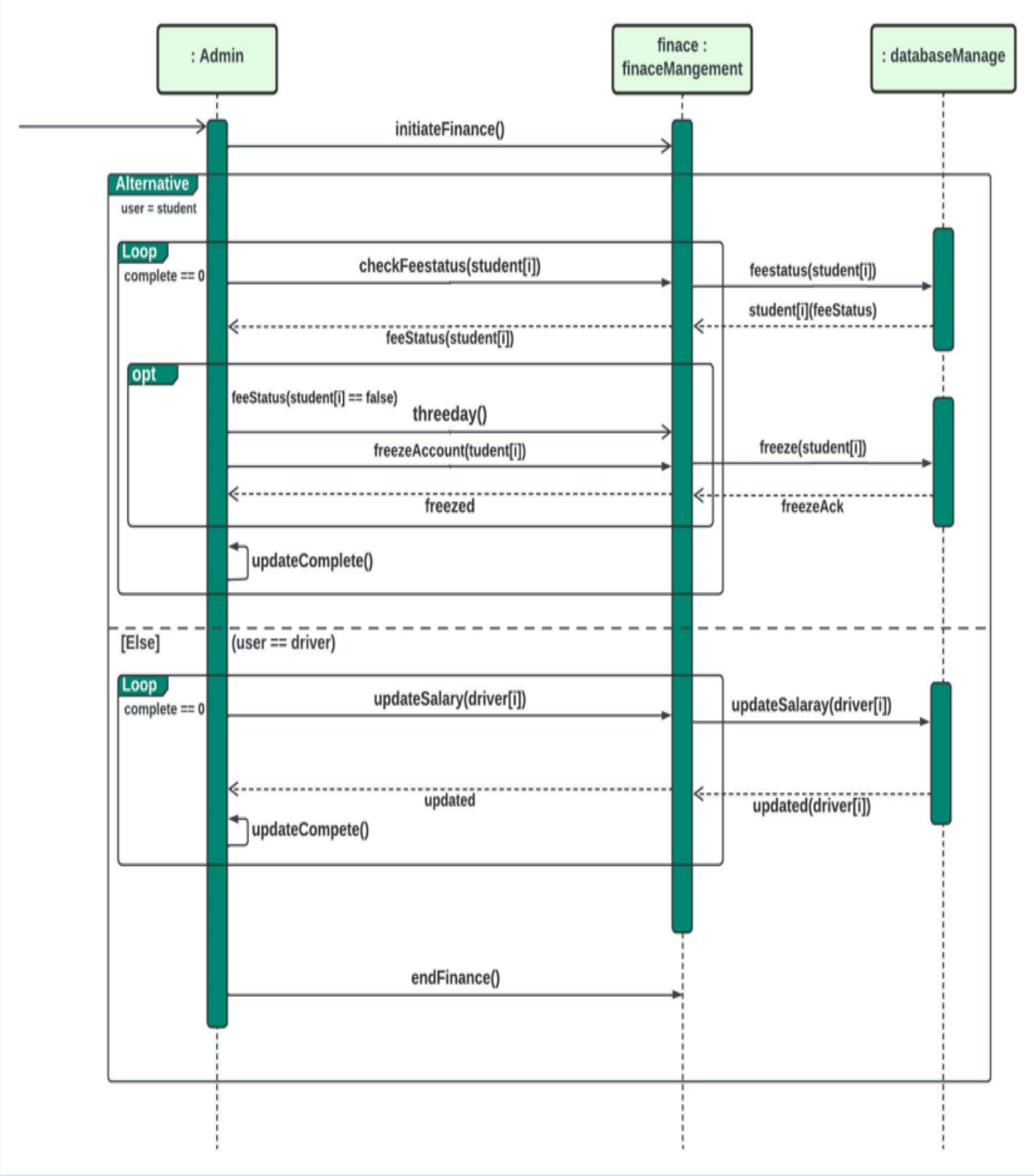


Sequence diagrams:

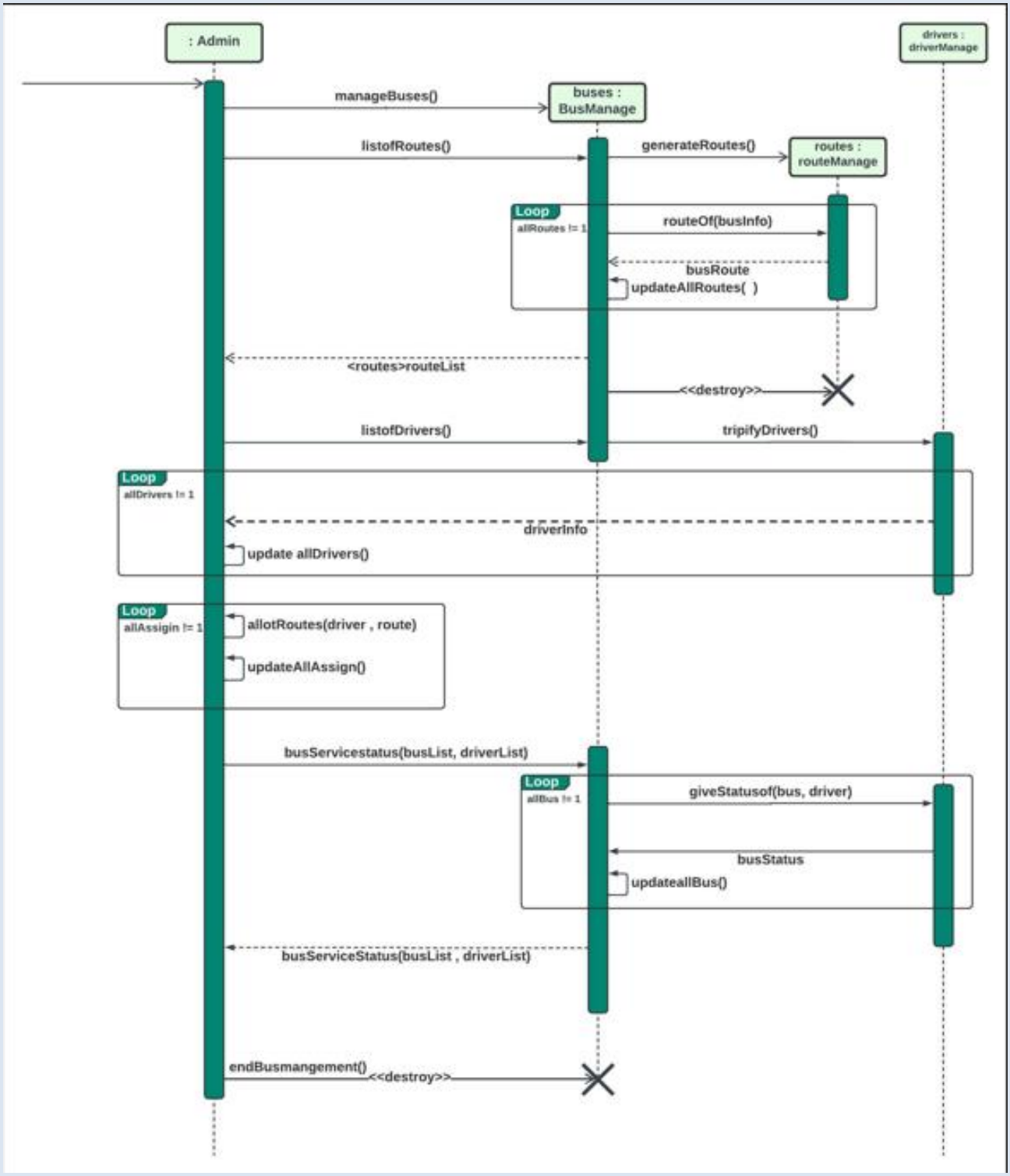
1. Book ride scenario



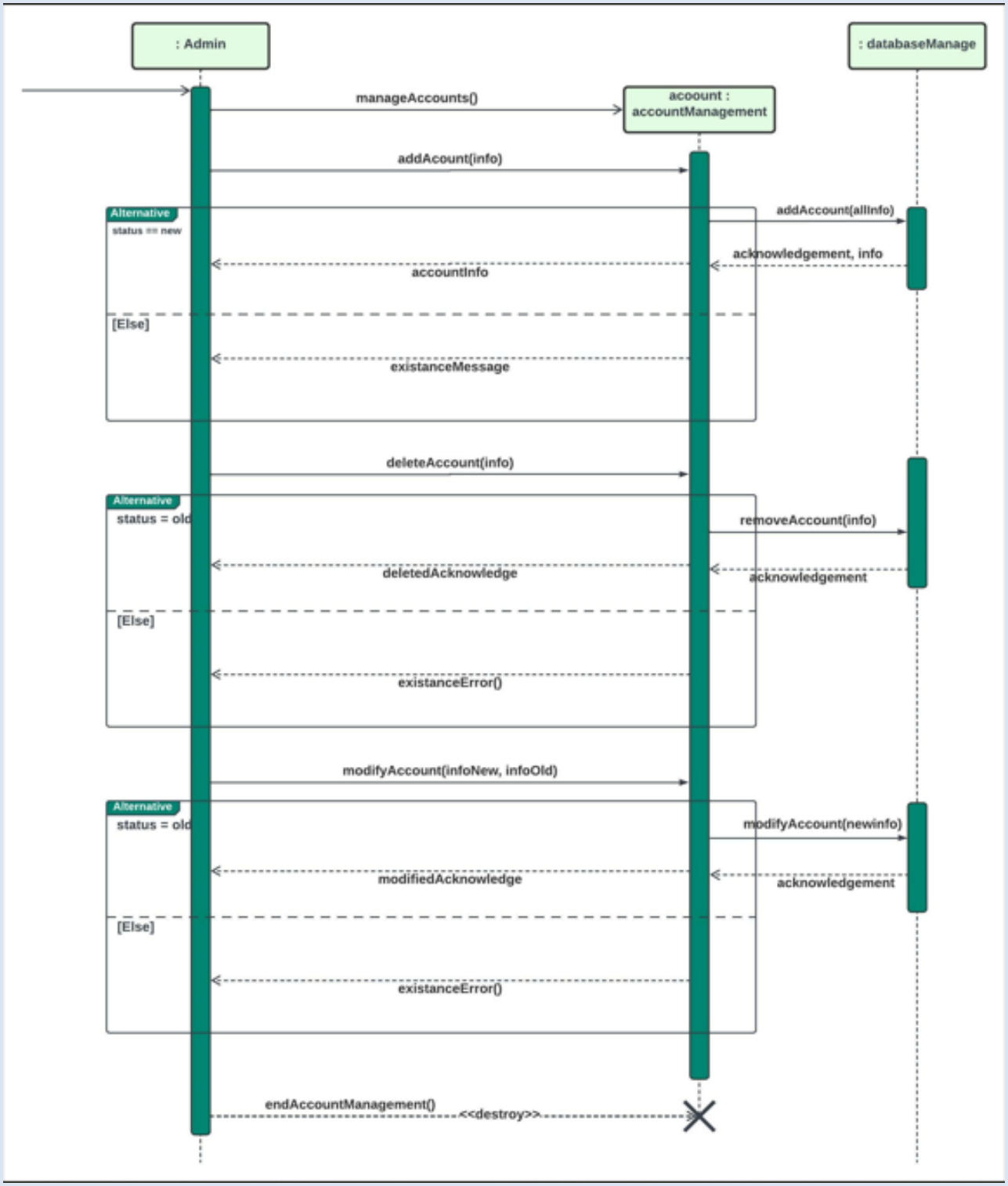
2. Manage Finance scenario



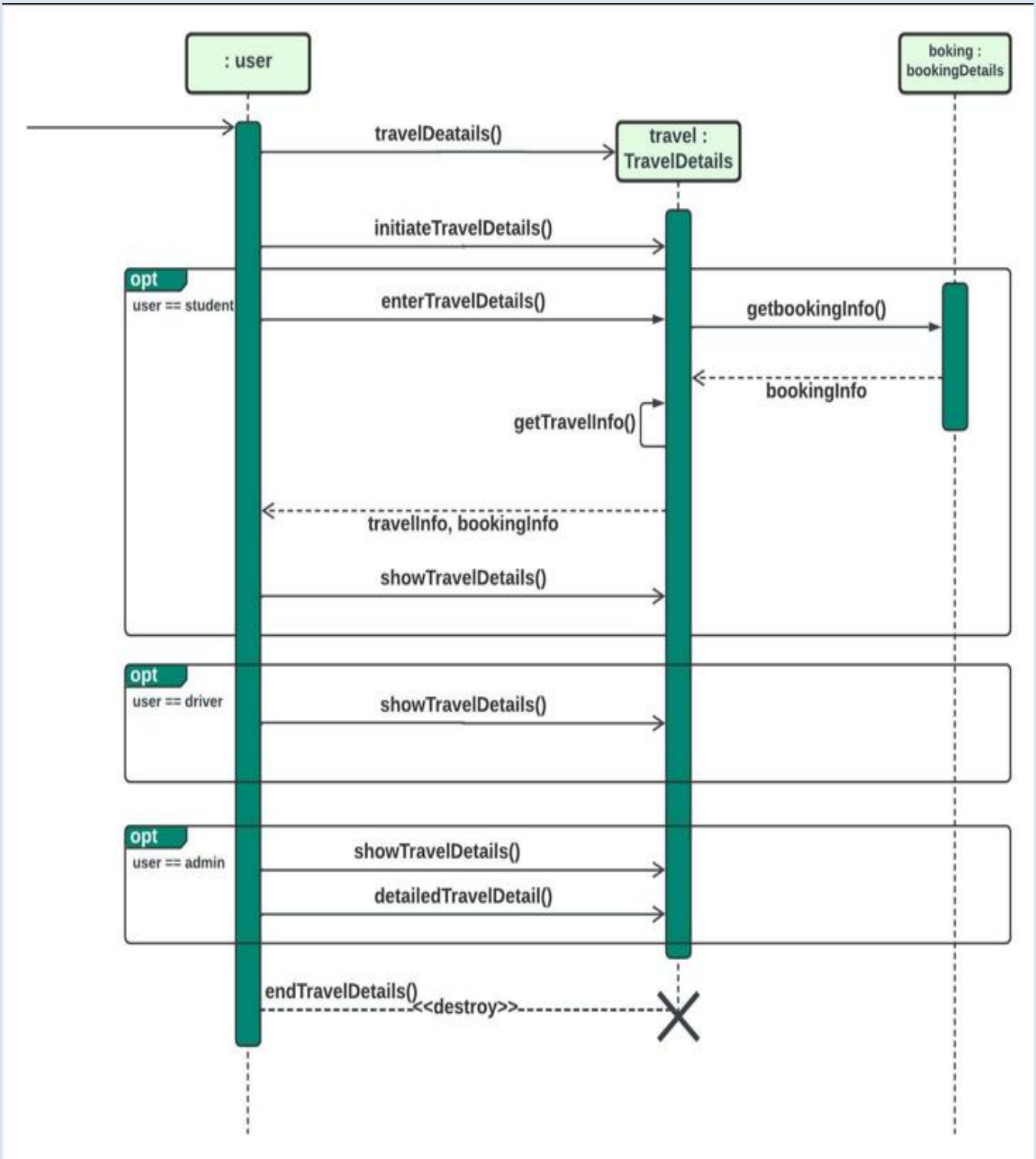
3. Manage Bus scenario



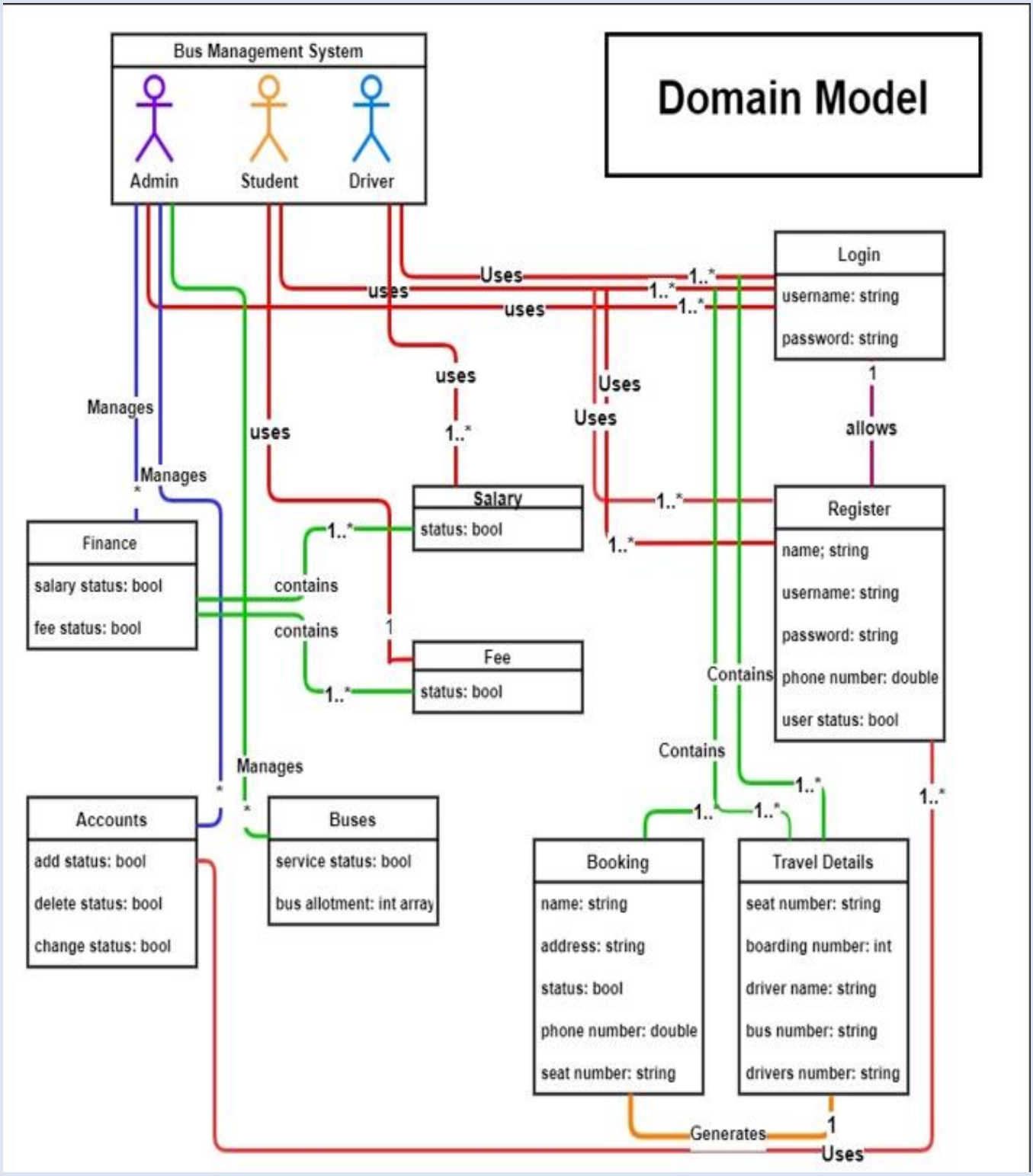
4. Manage Accounts scenario



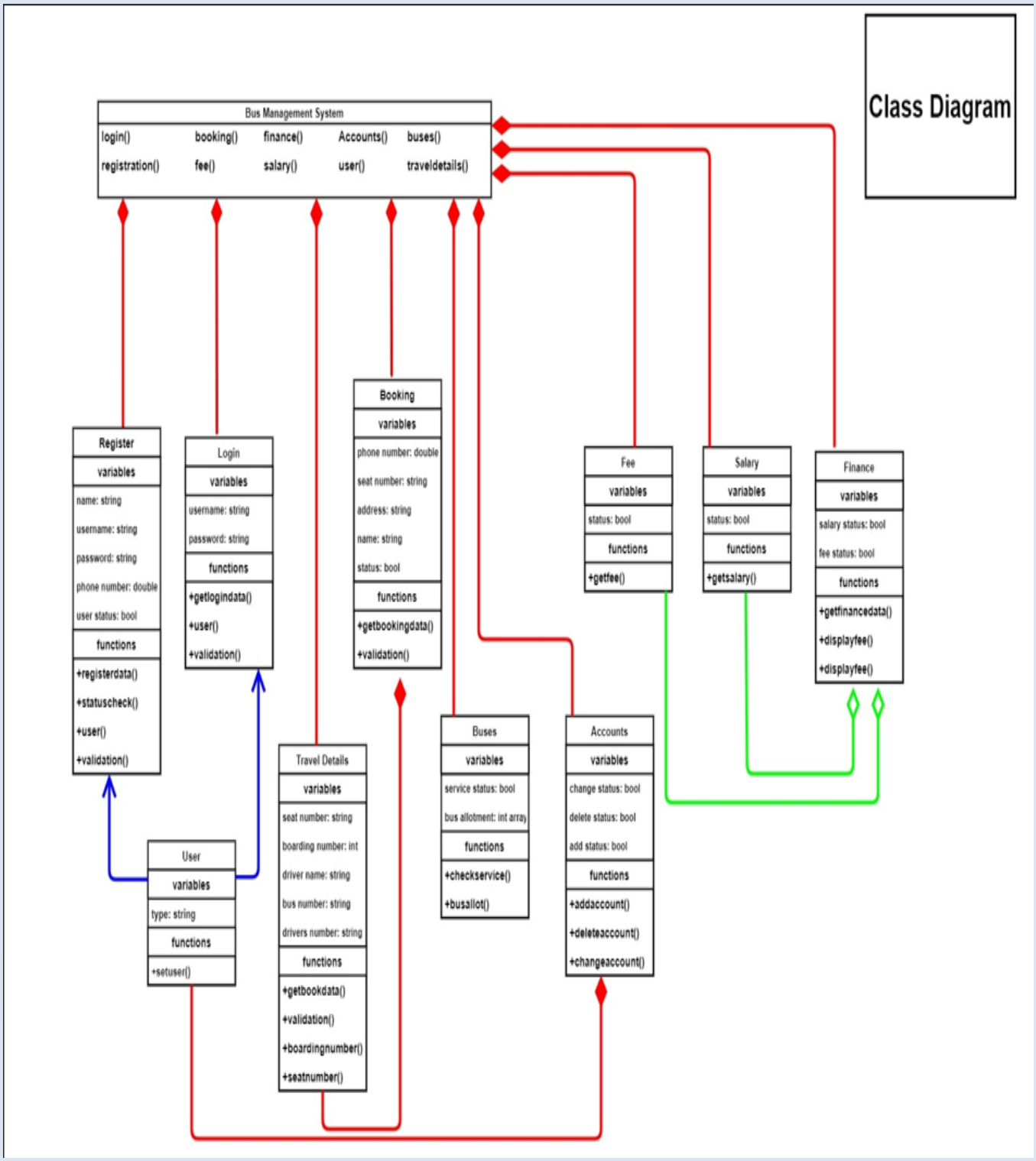
5. Travel Details scenario



Domain Model:



Class Diagram:



Links:

- https://app.diagrams.net/#G11mERNChEszvT75v6e_uVEVixzsHHw59U
  (Link of all the images/diagrams made in the assignment)