**Case Study 1**

METRO SYSTEM

Design and develop an application for central metro system. The application needs to provide the swipe in and swipe out functionality.

Swipe in refers to boarding the station. Swipe out refers to coming out of the station. Every metro station has both swipe in and out facilities. There will be a metro card issued to every user with a minimum balance of Rs 100.

The metro line consists of 5 linear stations as mentioned below.

Instructions –

A. When a new user is created, accept user’s basic details along with the card balance to issue the card to the user.

B. For Swipe in functionality, the application should

1. Accept the user’s input as source station.

2. The station can be from the above list only.

3. Validate the minimum required balance in the card. The user should have minimum balance of Rs 20 in the card.

4. On successful swipe in, which means if the minimum balance is present then print the message as “You have successfully swiped in at the station” + <Source Station Name>.

C. For Swipe out functionality, the application should

1. Accept the user’s input for destination station.

2. The station can be from the above list only.

3. Calculate the total fare based on source and destination stations and deduct the fare from the card balance. The fare calculation is based on the below rules.

a. Fare between any 2 adjacent stations is Rs 5. Example – Fare between L1 and L2 is Rs 5 and fare between L2 and L3 is Rs 5.

4. After deducting balance, the message needs to be printed “You have successfully swiped out with card balance as” + <actual card balance>

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**Case study 4**

You have to design a Library management system for your company. The employees can get different types of books issued from library.

There are three types of books available in the library. All the books can be issued for 7 days only.

1. Data Analytics – The late fee is Rs 5 per day.

2. Technology – The late fee is Rs 6 per day.

3. Management – The late fee is Rs 7 per day.

The application should provide “Return Book” functionality.

Assumptions –

1. Date api can be used.

2. Return date can be taken as today’s date by default.

Instructions –

For return book, the application should

1. Take input as employee details, type of book to be returned and issue date of that book.

2. Based on number of days between issue date and today’s date, if the employee is late in returning the book then calculate late fee as per the rules mentioned with type of book else late fee will be 0.

3. For the positive case when employee is not late in returning the book, print the message as “There is no late fee applicable and the book has been returned”.

4. Display the details with the following information.

· Name of Employee

· Type of Book

· Issue Date

· Return Date

· Late Fee