Semester Project (Object Oriented Programming)

Pakistan Post Courier Service

Design Deadline (UML Diagram): 7th December, 2021 before 23:59

Implementation Deadline: 19th December, 2021 before 23:59

Instructions

1. It is an individual project.
2. Make sure that you read and understand each and every instruction. If you have any questions or comments, you are encouraged to discuss your problems with your colleagues (and instructors) on Google Classroom.

3. Plagiarism is strongly forbidden and will be very strongly punished. If we find out that you have copied from someone else or someone else has copied from you (with or without your knowledge) both of you will be punished. You will be awarded (straight zero in the project — which can eventually result in your failure) and appropriate action as recommended by the Disciplinary Committee (DC can even award a straight F in the subject) will be taken.

4. **Try to understand and do the project yourself even if you are not able to complete the project. Note that you will be mainly awarded on your effort not on the basis whether you have completed the project or not.**

5. Divide and conquer: since you have around 17 days so you are recommended to divide the complete task in manageable subtasks. We recommend to complete the drawing and design (i.e. number of classes and their relationships) phase as quickly as possible and then focus on the intelligence phase.

6. Before writing even one line of code, you must design your final project. This process will require you to break down and outline your program into classes, design your data structure(s), clarify the major functionality of your program, and pseudo-code important methods. After designing your program, you will find that writing the program is a much simpler process.

7. Write your code in multiple file systems as you already familiar in the lab.

8. No Marks will be given if you do not submit your class diagram and if you do not use the object oriented design principles you have learned during the course.

9. **Imagination Powers:** Use your imaginative powers to make this as interesting and appealing as you can think of. An excellent solution can get you bonus marks.

Note: More than 25% similarity (plagiarism) in the code will result in Zero as defined in the Instruction 3.

Description

The Pakistan Post wishes to develop a system that works for their day-to-day operations. The Pakistan Post is organized in the following way.

There are several post offices each of them has some unique code and address and collection centers each of which processes documents/ parcels to deliver such as letters, packets, etc.

Mail has various services such as same day, one day, urgent and regular. Same-day mail service is for local vicinity, one day for other neighbour cities. Similarly, urgent mail service has extra charges of 20% compared to the regular mail service.

An invoice will be issued for every parcel. The invoice has a unique order ID and all the information related to the parcel/document which includes their weight, dimensions, shipment time, the address of the sender and receiver as well as contact details of both. So that if the receiver did not receive the shipment it will be returned to the sender.

There are multiple sections of the post office like the shipment section that takes the parcel/document stamped and sets it for sent to the destination. The parcel-deliver section will receive the shipments from other post offices (cities, countries) then enter them into their system and at the end, they will hand over to the postman. The not-shipped section will maintain the undelivered package and its record.

The sorting section sorts the mails in such a way that every mail that belongs to the same city/country is put in the same bag. Then sent to the GPO of that city, the GPO then further sort on the basis of local vicinity. The accounts section maintain the accounts related services.

At Post Office, you have to buy the postal stamps for your document/parcel. These postal stamps have some specific price i.e. Rs.5, 10,20, 50, 100. The variation in the number of postal stamps is being used for parcel/document that depends upon the nature of the parcel/document i.e. the number of tickets and their price may vary because of their weight or based on distance (local, national, international). Tickets/ stamps will be solved without invoice but one invoice will be issued for all stamps sold in a day. Reports can show various categories of various parcels and tickets.

Postal-Workers are used for managing all types of mail services. The clerk stamps the postal documents/parcel and then dispatch them. The postman delivers the parcel to its destination. The Head of each Pakistan Post will finalize financial collections every day and submit them to the local GPO of each city. Pakistan Post handles the returned and bounced mails as well.

Mails from other cities and countries are first received at the GPO then they are distributed to the different post offices based on their postal codes.

Customers (Senders) can track his/ her mail on a system with all confirmations and expected duration. Senders and recipient addresses will also store in the file system for future purposes. Search can be managed with some choices to extract data of Customers along with financial collections.

At present, the Pakistan Post has a manual record system but this needs rationalization.

Major Operations

1- You must identify the all classes and their relationships.
2- Registration for customers
3- Head of the Post office can add the new employee, update, and delete it.
4- Login system for the employee
5- Daily report of the post office that includes amount that collected, number of postal stamps sold from which category.
6- Maintain the record of each post office separately.
7- You must maintain the record of (the shipped item where it actually is right now). This means you have to include the tracking system.
8- Also to maintain the record of the shipments that are not delivered to the destination. And at least sent two times to the receiver before returned to the sender.
9- You sorting of the mails based on their postal addresses i.e. city, country etc.
10-   Use file handling to store information of post office, employees, customers mails and other entities.
11-   A complete menu for each operation that includes previous menu and multiple options on the console.
12-   All the information must be stored into filing system. Instead of using databases You must have to make your project perfect by introducing filing in it.
    a. Save the transactions of a person in a file.

b. Read the customer from file, create the new customer in the file same goes for the postal workers.
c. All the information related to the GPO, Post Offices and Address will be saved and retrieved from the file.
d. You have to load the data from file to arrays, and object of arrays when do required.

Type of Service	Rate of fee for weight upto 250 gm	Rate of fee for Weight Upto 500 gm	Rate of fee for every additional 500 gm
UMS (Local)	Rs.51	Rs.64	Rs.26
UMS (City to City)	Rs.86	Rs.132	Rs.43

Figure 1: Urgent Mail Service Charges

Revised Rates Effective from May 4, 2019		
S.No	Slab	Rate
1	Up to 1 Kg	Rs. 100
2	Up to 3 Kg	Rs.175
3	Up to 5 Kg	Rs. 250
4	Up to 10 Kg	Rs. 375
5	Up to 15 Kg	Rs.500
6	Up to 20 Kg	Rs. 625
7	Up to 25 Kg	Rs. 750
8	Up to 30 Kg	Rs. 875
Registration Fee for Parcels		Rs. 75

Figure 2: Normal charges