

Student Info

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Project Name

Customer Address Tracking System

The Main Purpose of the Program

The main purpose of this program is to manage customer addresses and track all address changes over time using Object-Oriented Programming (OOP) concepts.

The system allows:

- Creating customers and managing their personal information
- Adding multiple addresses for each customer
- Defining one primary address only
- Tracking address changes using a logging mechanism
- Applying different behaviors for VIP customers
- This program simulates a real-world customer address management system used in delivery, e-commerce, and CRM systems.

Program Objects and Relationships

Person

Represents a basic person in the system and contains common information such as ID, name, and phone number. It is used as a base class to apply inheritance.

Customer

Represents a customer who owns multiple addresses.

The customer class extends Person and manages:

- A list of addresses
- A list of address change logs
- Monthly delivery data

VIPCustomer

Represents a special type of customer with additional privileges. This class extends Customer and overrides some behaviors such as adding addresses.

Address

Represents a physical address with details such as country, city, street, type, and status.

It also stores activation and deactivation dates.

AddressChangeLog

Represents a record of address changes and is used to track address history.

Relationships Between Objects

- Inheritance
- Customer extends Person
- VIPCustomer extends Customer
- Association
- One Customer can have many Addresses
- One Customer can have many AddressChangeLogs

These relationships help organize the program structure and support reusability and scalability.

Complex Rules

Rule 1: Only One Primary Address

Each customer can have only one primary address at any time.

When a new primary address is selected, the old primary address is automatically deactivated.

Purpose: To avoid conflicts and ensure data consistency.

Rule 2: No Duplicate Address Type in the Same City

A customer cannot have more than one active address of the same type (e.g., Billing) in the same city.

Example: A customer cannot have two active Billing addresses in Istanbul.

Purpose: To prevent address duplication and data redundancy.

Rule 3: Address Change Tracking

Whenever the primary address changes:

- The old address is deactivated
- The new address is activated
- A new record is added to the AddressChangeLog

Purpose: To keep a complete history of address changes for tracking and auditing purposes.

Rule 4: VIP Rule (Overriding Behavior)

VIP customers are allowed to add addresses that violate Rule 2, but such addresses are saved as inactive.

Purpose: To demonstrate method overriding and polymorphism.

This project demonstrates a practical application of Object-Oriented Programming concepts using a real-life scenario. It combines inheritance, polymorphism, method overloading, method overriding, and data tracking in a clean and structured design.