St. Vincent Pallotti College of Engineering & Technology
Department of Computer Engineering
Object Oriented Programming
Assignment-I

1. **Draw Class Diagram**
2. **Draw Data Flow Diagram**
3. **Program**

Design and develop Library Management System

Create a library management system that allows users to perform basic operations such as adding books, borrowing books, returning books, and displaying the available books.

The program should have the following functionalities:

Create a Book class with the following private data members:

1. `title` (string): to store the title of the book.
2. `author` (string): to store the author of the book.
3. `isbn` (string): to store the ISBN number of the book.
4. `isAvailable` (bool): to track the availability of the book.

The class should have appropriate member functions to access and modify these data members.

Create a Library class with the following private data members:

1. `books` (array of Book objects): to store the collection of books in the library.

The class should have the following member functions:

1. A function called `addBook()` that takes the title, author, and ISBN number as arguments and adds a new Book object to the collection.
2. A function called `borrowBook()` that takes the ISBN number as an argument and marks the corresponding book as unavailable.
3. A function called `returnBook()` that takes the ISBN number as an argument and marks the corresponding book as available.
4. A function called `displayBooks()` that displays the details of all the available books.

In the `main()` function, create a Library object and provide a menu-driven interface to interact with the library. The menu should include options to:

1. Add a book
2. Borrow a book

3. Return a book
4. Display available books
5. Exit the program

Use appropriate loops and conditional statements to allow users to perform multiple operations until they choose to exit the program.

Design and develop Employee Management System

Create an employee management system that models different types of employees in an organization. The system should include a base class called `Employee` and derived classes for specific types of employees such as `Manager`, `Engineer`, and `Technician`.

The `Employee` class should have the following data members and member functions:

- Data members:
  - `name` (string): to store the name of the employee.
  - `employeeId` (int): to store the unique ID of the employee.
  - `salary` (float): to store the salary of the employee.
- Member functions:
  - A constructor that takes the name, employee ID, and salary as arguments and initializes the corresponding data members.
  - A function called `displayDetails()` that displays the details of the employee, including the name, employee ID, and salary.

The derived classes (`Manager`, `Engineer`, `Technician`) should inherit from the `Employee` class and add their own unique data members and member functions. Each derived class should overload the `displayDetails()` function to provide its own implementation for displaying the details of the employee.

In the `main()` function, create objects of each derived class and demonstrate the use of inheritance by calling the `displayDetails()` function on each object to display the employee details.