National Textile University

Department of Computer Science

Lab#08: Object Oriented Programming- COC2071

Instructor: Abdul Qadeer Bilal

Registration #		Name	
Total Marks	20 marks (10 marks each)	Marks Obtained	
Tools	Visual Studio		
Objectives	1) Abstraction	2) Polymorphism	
Note	Solve the following problems using the concepts we have covered so far		

QUESTION:1

Design a simple online bookstore system using C# classes and abstract classes. Your system should include the following entities:

1) **Book (Abstract Class):**
    i)   Properties: ISBN, Title, Author, Price
    ii)   Abstract Method: **DisplayInfo()** to display book information.
2) **EBook (Derived from Book):**
    i)   Additional Property: Format (e.g., PDF, EPUB)
    ii)   Override **DisplayInfo()** method to include format information.
3) **PhysicalBook (Derived from Book):**
    i)   Additional Property: Weight
    ii)   Override **DisplayInfo()** method to include weight information.
4) **Customer Class:**
    i)   Properties: Name, Email, ShoppingCart (a list of books)
    ii)   Method: **DisplayShoppingCart()** to display the books in the shopping cart with their information.

Your program should allow a user to:

- Create instances of **EBook** and **PhysicalBook**.
- Add books to the shopping cart of a customer.
- Display the information of each book in the shopping cart, including the format for e-books and weight for physical books.
- Calculate the total price of the books in the shopping cart.
- Ensure that you demonstrate the use of abstract classes and proper inheritance.

QUESTION:2

Design a system to manage hotel reservations using C# classes. The system should include the following entities:

Hotel:

- Properties: HotelID, Name, Location.
- Method: DisplayHotelDetails() to display the details of the hotel.

Base Class ABSTRACT - Room:

- Properties: RoomNumber, Price, Available (boolean indicating whether the room is available for reservation).
- Method: DisplayRoomDetails() to display the details of the room.

Derived Class - SingleRoom:

- Properties: String Type =single.
- Method: DisplayRoomDetails() to display the details of the room.

Derived Class - DoubleRoom:

- Properties: String Type =Double.
- Method: DisplayRoomDetails() to display the details of the room.

Derived Class - Suite:

- Properties: String Type =Suite.
- Method: DisplayRoomDetails() to display the details of the room.

Customer:

- Properties: CustomerID, Name, ReservationHistory (a list to store reserved rooms).
- Method: DisplayCustomerDetails() to display the details of the customer.

Reservation:

- Properties: ReservationID, ReservationDate, CheckInDate, CheckOutDate, TotalCost.
- Method: CalculateTotalCost() to calculate the total cost of the reservation.

Create a class `HotelReservationSystem` to manage the system. Include methods to make a reservation, cancel a reservation, display available rooms, and show reservation history for a customer.

Implement polymorphism by creating multiple types of rooms (e.g., SingleRoom, DoubleRoom, Suite) that inherit from the Room class. Override the DisplayRoomDetails() method in each derived class to display specific details for each room type.