# .NET Week 5 Coding Challenge - C#.NET Programming Assessment.

Date: 09-10-2023 Duration: 3 Hours.

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**Choose any 3 of the following 5 problem statements and write the code as per description in the problem statement. Read and understand the PS carefully.**

1. Implement an abstract class "Shape" with abstract methods for calculating area and perimeter. Create three subclasses (e.g., Circle, Rectangle, Triangle) that inherit from Shape and provide their own implementations for these methods. Demonstrate polymorphism by creating an array of Shapes and calculating the total area and perimeter.

2. Create a scenario where you need to model a "Person" class with properties like Name, Age, and Address. Implement multiple interfaces (e.g., IDriver, IStudent, IEmployee) to represent different roles that a person can have. Create a class that inherits from Person and implements multiple interfaces, showcasing multiple inheritance through interfaces.

3. Design a simple event management system using delegates and events. Create a class "EventManager" that allows users to subscribe to events and trigger them. Implement custom delegates and events to handle various event types (e.g., Conference, Seminar, Workshop). Demonstrate how delegates and events can be used to notify subscribers when events occur.

4. Build a generic collection to manage a library's inventory of books. Create a class "Book" with properties like Title, Author, and ISBN. Implement a generic collection (e.g., List<Book>) to add, remove, search, and display books. Utilize generics to ensure type safety and efficient data management.

5. Create a program for managing student records using file I/O streams and serialization. Define a class "Student" with properties like Name, ID, and GPA. Implement methods to serialize and deserialize student objects to/from a binary file. Allow users to add, view, update, and delete student records, maintaining data integrity using file I/O.

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