C# Programming ⏱ 9 hours of content | 30 hours of practice

1. Introduction to Programming in C#

- What is a programming language?
- Introduction to C#
- Overview of .NET versions
- Commercial use cases of C#
- Setting up the Visual Studio environment
- Creating and configuring a project
- First Console application
- Input and Output operations
- Working with strings and numbers
- Variable types
- Conditional statements
- Arrays
- Loops: for, while, foreach
- break and continue
- Enums and switch statements
- Value types vs Reference types

2. Object-Oriented Programming (OOP)

- Principles of Object-Oriented Programming
- Methods and working with parameters
- Classes
- Stack vs Heap and Object Allocation
- Value vs Reference types
- Encapsulation and Access Modifiers
- Getters and Setters
- Constructors and the this keyword
- Inheritance and Polymorphism
- Interfaces and Abstract Classes
- The base keyword
- Exception Handling (try-catch)
- Structs as Value Types
- IDisposable and the using keyword
- The Object class

3. Advanced C# Programming

- Data Structures:
  - LinkedList, Stack, Queue, Dictionary
- Operator Overloading
- Extension Methods
- Assemblies and Libraries
  - The bin folder and build structure
- Delegates, Events, and Lambda Expressions
  - Anonymous Methods
- LINQ to Objects
- Recursion
- Garbage Collection
- Lazy Initialization
- Attributes and Reflection
- Introduction to WPF

4. Data Breaches

- What is a Data Breach?
- Consequences of Exposed Information
- How to prevent data leakage

5. Security – SQL Injections & Databases

- Introduction to Databases
- Creating and configuring a database in Visual Studio
- Performing database operations using SQL and C#
- Demonstrating SQL Injection vulnerabilities
- Implementing fixes to prevent SQL Injection

6. Security – Hashing

- What is Hashing?
- How to hash a password
- Storing hashed passwords securely
- Using database keys for secure storage

7. Malware Awareness

- What is Malware?
- Common types (viruses, ransomware, spyware)
- How malware spreads and how to avoid it