Application Development with .NET Framework

Workshop Details:

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| Duration: | 8 Days |
| Description: | This session covers the following topics:   * .NET Framework 4.8 and C# 7 * C# fundamentals * .NET Framework fundamentals * Windows Forms * Class libraries * Console Applications |
| Objectives: | This course helps you to understand the .NET framework 4.5 features to develop windows and web applications. |
| Participants’ Entry Profile: | Participants attending this course must have development experience on:   * Basic knowledge of Object oriented concepts * Basic knowledge of web applications |
| Training Methodology: | The workshop will follow Synergetics methodology of   * Concept Visualization * Active Experimentation * Application Development   The workshop will be 100% Hands-On with each participant having access to system during the session |

Setup Requirements:

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| Hardware and Software Requirements: | Participant’s as well as Trainer’s Machine are required to have:  Hardware   * Intel Pentium 4 [2+ GHz recommended] * 4 GB RAM * 50 GB HDD space * LAN connectivity * Good Internet connectivity and bandwidth   Software [Installed]   * Windows 10 or later * .NET framework 4.8 or later * Visual Studio 2019 Community Edition * SQL Server 2017 * SQL Server Management Studio * Chrome latest, Firefox latest |
| Training Lab Requirements: | Whiteboard 6 feet by 4 feet (minimum)  Whiteboard markers – Red, Blue, Green, Black  Video Projector (1024 X 768 resolutions) |
| Virtual Lab Requirements:  [Optional] | Virtual labs can be provided for participants, that provides completely configured platform to work with. |

Course Contents:

Day 1

Introduction to .NET Framework

* History of .NET Framework
* .NET Framework architecture
* What is .NET Framework
* .NET Framework, Languages, and Tools
* .NET Framework Major Components
* Common Language Runtime (CLR), CLS, CTS
* Compilation and Execution in .NET
* Understand the .NET Framework stack

Programming with C#

* Features of C#
* C# Compilation and Execution
* General Structure of a C# Program
* Assemblies – EXE and DLL
* Creating and Using a DLL
* Global Assembly Cache
* Private and Shared Assemblies
* Signing Assemblies
* Single file and multifile assemblies
* Building Console Applications

Day 2

Data Types and Arrays in C#

* Data Types in C#
* Value Types and Reference Types
* Boxing and Unboxing
* Single Dimensional, Multi-Dimensional & Jagged arrays
* Nullable Types
* Implicitly Typed Local variables
* Var and dynamic declarations

Object Oriented Programming with C#

* Classes and Objects
* Constructors
  + Static and nonstatic constructors
* Object initialization in C#
* Access modifiers
* Properties and Indexers
* Method Parameters (out, ref and params)
* Const and readonly declarations
* Optional Parameters and Named Arguments
* Checked and unchecked statements
* Static and non-static members
* Anonymous class objects

Day 3

Inheritance

* Inheriting from base class
* Abstract base class
* Abstract methods and virtual methods
* Defining methods with new keyword
* Overriding methods
* Interfaces
  + Implementing interfaces
  + Explicitly implement interfaces
  + Defining types in interfaces

Classes and methods

* Static classes
* Partial Classes
* Sealed classes
* Nested classes
* Structures Vs Classes
* Method overloading
  + Operator overloading
  + Function overloading
  + Constructor overloading

Day 4

Delegates, Events and Lambdas

* Concept of Delegates
* Singlecast and Multicast Delegates
* Func<T>, Action<T>, Predicate<T> delegates
* Understanding C# Events
  + EventHandler delegate
  + Register and unregister events
  + Event notifications using delegates
* Co-Variance and Contra-Variance
* Anonymous Method Explained
* Lambda Expressions

Nullable Data Types

* Value types that hold Null values
* System.Nullable<T> generic type
* Shortcut declaration for Nullable
* ?? operator

Day 5

Collections & Generics

* System.Collections Namespace
* Collection Interfaces
* Collection Classes
  + List and Dictionary
  + Set and Property classes
* Working with Generics
* Generic Methods, Interfaces, Delegates
* Collection Initializers
* Iterator and IEnumerable
* Creating custom collection classes

Exception Handling in C#

* Exception Handling in C#
* The System.Exception class
* Try..catch statement
* Multiple Catch statements
* User Defined Exception

Day 6

Introduction to Windows forms

* Console vs Windows Application
* Challenges for Windows Applications
* Windows Forms
  + Border types and other properties
  + Form Events
* Common controls
* Event Handling in forms

Forms and Controls

* ToolStrip Control
* Anchor Styles
* Docking Styles
* Using Layout to design the Window
* FlowLayout Panel
* TableLayout Panel
* Visual inheritance
* Set the Tab Order for Controls
* Anchor a Control in Windows Forms
* Dock a Control in Windows Forms
* Dialog Boxes

Day 7

Working with MDI Forms

* SDI vs. MDI Applications
* Creating MDI Applications
* Creating MDI Child Forms

Working with Menus

* How to Create a Menu
* How to Create a ToolStrip
* How to Create a Context Menu
* How to Create a Status Bar

Introduction to ADO.NET

* Getting Started with ADO.NET 4.5
* Connected and Disconnected Architecture
* System.Data namespace
* ADO.NET Generic Classes

Working with Connected Architecture

* Creating SqlConnection
* Use of Command object
* Reading data using SqlDataReader
* Commands to Manipulate Data
* Multiple Active ResultSets

Day 8

Working with Disconnected Architecture

* Using SqlDataAdapter
* Creating and Using DataSet to retrieve Data
* Manipulating Database using DataSet
* Managing Data Integrity and Concurrency

Advanced Database concepts

* Typed and untyped datasets
* Creating DataSet
  + Named and unnamed datatables
  + DataRow, DataColumn
* Setting constraints on a DataTable
  + Primary Key
  + Unique
  + Foreign Key
* SqlCommandBuilder class
  + Insert, Delete and Update commands
* Binding Form controls using DataSets

Data Binding through code

* Data binding with Windows controls
* Using CurrencyManager
* BindingSource Class to bind data to the Controls
* BindingNavigator to navigate through the records
* Filtering and Sorting data in a DataTable using DataViews
* ToTable feature of DataView