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- .NET Framework Architecture and Components
- Introduction to C# Programming Language
- How to Download and Install Visual Studio on Windows
- Creating First Console Application using Visual Studio

C#.NET Basics

- Basic Structure of C# Program
- Methods and Properties of Console Class in C#
- Data Types in C#
- Literals in C#
- Type Casting in C#
- Variables in C#
- Operators in C#
- Control Flow Statements in C#
- If-Else Statements in C#
- Switch Statements in C#
- Loops in C#
- While Loop in C#
- Do While Loop in C#
- For Loop in C#
- Break Statement in C#
- Continue Statement in C#
- Goto Statement in C#
- Functions in C#

C#.NET Tutorials For Beginners and Professionals

C#.NET Tutorials For Beginners and Professionals

In this C#.NET tutorial For Beginners and Professionals article series, we covered all the basic and advanced concepts of C#.NET. This C# Tutorials For Beginners and Professionals course is going to explain using different types of applications which include the Console, Windows, ASP.NET Webform, **ASP.NET MVC**, and **ASP.NET Web API** by taking some real-time scenarios.

It is very important to understand C#.NET as it is the base for all types of applications. The C#.NET is the most powerful programming language among all programming languages available in the .NET framework.

For whom?

These **C#.NET tutorials** are designed for beginners as well as professional developers who want to learn C# step by step from the very basic to the advanced concept using real-time examples. These tutorials provide a hands-on approach to the subject with step-by-step program examples that will assist you to learn and put the acquired knowledge into practice.

What is C#.NET?

C#.NET is one of the Microsoft programming languages. It is the most powerful programming language among all programming languages available in the .NET Framework. The C#.NET contains all the features of C++, VB.NET, and JAVA, and also some additional features. The C#.NET programming language is designed to be a simple, modern, general-purpose, and completely object-oriented programming language.

C# is just a simple, secure, robust, portable, platform-independent, architectural neutral, multithreaded, object-oriented programming language with a strong type exception handling mechanism for developing different kinds of applications such as Web, Windows Form, Console, Web Services, Mobile Apps, etc.

C# is pronounced as “C-Sharp”. It is an object-oriented programming language provided by Microsoft that runs on the .Net Framework. C# is a modern, general-purpose, object-oriented programming language developed by Microsoft and approved by European Computer Manufacturers Association (ECMA) and International Standards Organization (ISO).

C# is approved as a standard by ECMA and ISO. C# is designed for CLI (Common Language Infrastructure). CLI is a specification that describes executable code and runtime environment. The C# programming language is influenced by C++, Java, Eiffel, Modula-3, Pascal, etc. Languages.

Types of Applications Developed using C#:

With the help of the C# programming language, we can develop different types of secured and robust applications:

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- Call by Value and Call by Reference in C#
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- Static vs Non-Static Members in C#
- Const and Read-Only in C#
- Properties in C#
- Why we Should Override ToString Method in C#
- Override Equals Method in C#
- Difference Between Convert.ToString and ToString Method in c#
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- Stack and Heap Memory in C#
- Boxing and Unboxing in C#

OOPs in C#

- Object Oriented Programming (OOPs) in C#
- Class and Objects in C#
- Constructors in C#
- Types of Constructors in C#
- Why We Need Constructors in C#
- Static vs Non-Static Constructors in C#
- Private Constructors in C#
- Destructors in C#
- Garbage Collection in C#.NET
- Access Specifiers in C#
- Encapsulation in C#
- Abstraction in C#
- Inheritance in C#
- Types of Inheritance in C#
- How to use Inheritance in Application Development
- IsA and HasA

3. **Distributed Applications**
4. **Web Service Applications**
5. **Database Applications**
6. **Mobile Applications, Etc.**

Features of C#

Although C# constructs closely follow traditional high-level languages, C and C++ and being an object-oriented programming languages. It has a strong resemblance with Java, it has numerous strong programming features that make it endearing to a number of programmers worldwide. Following is the list of a few important features of C# −

1. **Simple**: C# is a simple language in the sense that it provides a structured approach (to break the problem into parts), a rich set of library functions, data types, etc.
2. **Modern Programming Language**: C# programming is based upon the current trend and it is very powerful and simple for building scalable, interoperable, and robust applications.
3. **Object-Oriented**: C# is an object-oriented programming language. OOPs makes development and maintenance easier whereas in Procedure-oriented programming language it is not easy to manage if code grows as the project size grows.
4. **Type-Safe**: C# type safe code can only access the memory location that it has permission to execute. Therefore, it improves the security of the program.
5. **Interoperability**: The interoperability process enables the C# programs to do almost anything that a native C++ application can do.
6. **Scalable and Updateable:** C# is an automatic scalable and updateable programming language. For updating our application, we delete the old files and update them with new ones.
7. **Component Oriented:** C# is a component-oriented programming language. It is the predominant software development methodology used to develop more robust and highly scalable applications.
8. **Structured Programming Language:** C# is a structured programming language in the sense that we can break the program into parts using functions. So, it is easy to understand and modify.
9. **Rich Library:** C# provides a lot of inbuilt functions that make development fast.
10. **Fast Speed:** The compilation and execution time of the C# language is fast.

What you will Learn From these C# .NET Tutorials?

In this C#.NET Tutorials, you will learn from basic to advance level concepts of C#. Some of them are as follows:

Chapter-1 Introduction & Environment Setup
Chapter-2 C#.NET Basics
Chapter-3 OOPs in C#
Chapter-4 Exception Handling
Chapter-5 Events, Delegates, and Lambda Expression in C#
Chapter-6 MultiThreading
Chapter-7 Collections in C#
Chapter-8 File Handling
Chapter-9 Asynchronous Programming
Chapter-10 Parallel Programming
Chapter-11 AutoMapper
Chapter-12 Optional Parameter, Indexers, and Enums
Chapter-13 .NET Framework Architecture
Chapter-14 Var, Dynamic and Reflection
Chapter-15 C# 7.X, 8.X, 9.X, 10.X New Features, and Many More

Prerequisites for this C#.NET Tutorials:

There are no prerequisites required to learn **C#.NET** as we are going to start from the very basics. It is good to have .NET Framework and Visual Studio installed on your computer, as it might assist you in executing the examples yourself and getting to know how it works.

Note: If we missed any topics in this C#.NET Course, then please let us know by giving a comment in the Comment Box and we promise as soon as possible we will publish articles on that topic.

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- Abstract Class and Abstract Methods Interview Questions in C#
- How to Use Abstract Classes and Methods in C# Application
- Interface in C#
- Interface Interview Questions and Answers in C#
- Interface Realtime Examples in C#
- Multiple Inheritance in C#
- Multiple Inheritance Realtime Example in C#
- Polymorphism in C#
- Method Overloading in C#
- Operator Overloading in C#
- Method Overriding in C#
- Method Hiding in C#
- Partial Class and Partial Methods in C#
- Sealed Class and Sealed Methods in C#
- Extension Methods in C#
- Static Class in C#
- Variable Reference and Instance of a Class in C#

Exception Handling

- Exception Handling in C#
- Multiple Catch Blocks in C#
- Finally Block in C#
- How to Create Custom Exceptions in C#
- Inner Exception in C#
- Exception Handling Abuse in C#

Events, Delegates and Lambda Expression in C#

- Course Structure of Events, Delegates and Lambda Expression
- Roles of Events, Delegates and Event Handler in C#
- Delegates in C#
- Multicast Delegates in C#
- Delegates Real-Time

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- Lambda Expressions in C#
- Events in C# with Examples

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- Thread class in C#
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- How to Retrieve Data from a Thread Function in C#
- Join Method and IsAlive Property of Thread Class in C#
- Thread Synchronization in C#
- Lock in C#
- Monitor Class in C#
- Mutex Class in C#
- Semaphore Class in C#
- SemaphoreSlim Class in C#
- Deadlock in C#
- Performance Testing of a Multithreaded Application
- Thread Pool in C#
- Foreground and Background Threads in C#
- AutoResetEvent and ManualResetEvent in C#
- Thread Life Cycle in C#
- Threads Priorities in C#
- How to Terminate a Thread in C#
- Inter Thread Communication in C#
- How to Debug a Multi-threaded Application in C#

Collections in C#

- Arrays in C#
- 2D Arrays in C#
- Advantages and Disadvantages of Arrays in C#
- Collections in C#
- ArrayList in C#

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- Generic Constraints in C#
- Generic List Collection in C#
- How to Sort a List of Complex Type in C#
- Comparison Delegate in C#
- Dictionary Collection Class in C#
- Conversion Between Array List and Dictionary in C#
- List vs Dictionary in C#
- Generic Stack Collection Class in C#
- Generic Queue Collection Class in C#
- Foreach Loop in C#
- Generic HashSet Collection Class in C#
- Generic SortedList Collection Class in C#
- Generic SortedSet Collection Class in C#
- Generic SortedDictionary Collection Class in C#
- Generic LinkedList Collection Class in C#
- Concurrent Collection in C#
- ConcurrentDictionary Collection Class in C#
- ConcurrentQueue Collection Class in C#
- ConcurrentStack Collection Class in C#
- ConcurrentBag Collection Class in C#
- BlockingCollection in C#

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- DirectoryInfo Class in C#

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- Task in C#
- How to Return a Value from Task in C#
- How to Execute Multiple Tasks in C#
- How to Limit Number of Concurrent Tasks in C#
- How to Cancel a Task in C# using Cancellation Token
- How to Create Synchronous Method using Task in C#
- Retry Pattern in C#
- Only One Pattern in C#
- How to Control the Result of a Task in C#
- Task-Based Asynchronous Programming in C#
- Chaining Tasks by Using Continuation Tasks
- How to Attached Child Tasks to a Parent Task in C#
- ValueTask in C#
- How to Cancel a Non-Cancellable Task in C#
- Asynchronous Streams in C#
- How to Cancel Asynchronous Stream in C#

Parallel Programming

- Task Parallel Library in C#
- Parallel For in C#
- Parallel Foreach Loop in C#
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- How to Cancel Parallel

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- Mapping Complex type to Primitive Type using AutoMapper in C#
- AutoMapper ReverseMap in C#
- AutoMapper Conditional Mapping in C#
- AutoMapper Ignore Property in C#
- UseValue ResolveUsing and Null Substitution in AutoMapper

Optional Parameter, Indexers and Enums

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- Indexers in C#
- Indexers Real-Time Example in C#
- Enums in C#

.NET Framework Architecture

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- Common Language Runtime in .NET
- .NET Program Execution Process
- Intermediate Language (ILDASM & ILASM) Code in C#
- Common Type System in .NET Framework
- Common Language Specification in .NET Framework
- Managed and Unmanaged Code in .NET
- Assembly DLL EXE in .NET Framework
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- Dynamic vs Reflection in C#
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- Ref vs Out in C#
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C# 7.X new Features

- C# 7 New Features
- Out Variables in C#
- Pattern Matching in C#
- Digit Separators in C#
- Tuples in C#
- Splitting Tuples in C#
- Local Functions in C#
- Ref Returns and Ref Locals in C#
- Generalized Async Return Types in C#
- Expression Bodied Members in C#
- Thrown Expression in C#
- Async Main in C#

C# 8 New Features

- C# 8 New Features
- ReadOnly Structs in C#
- Default Interface Methods in C#
- Pattern Matching in C#
- Using Declarations in C#
- Static Local Functions in C#
- Disposable Ref Structs in C#
- Nullable Reference Types in C#
- Asynchronous Streams in C#
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SMRUTI RANJAN JENA
NOVEMBER 10, 2018 AT 9:37 AM

First I would like to thank Dotnet for sharing these materials. These are really good and up-to the point and very understandable. Anyone with basic knowledge can also read these and increase their knowledge.

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DECEMBER 18, 2018 AT 8:25 PM

Thank you for your feedback

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OLAYINKA
JANUARY 3, 2019 AT 10:02 PM

This is great!

Reply

DOT NET TUTORIALS
FEBRUARY 18, 2020 AT 7:14 PM

Thank you so much for your feedback

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VIRAM SHAH
MARCH 31, 2019 AT 11:42 AM

Your Matreial is Fantastic.

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CHANIKYA YG
APRIL 30, 2019 AT 11:10 PM

Wonderful material for DotNet.

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ANIL KUMAR T
AUGUST 6, 2019 AT 12:45 AM

Excellent Stuff …ALL in ONE

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MOHIT
SEPTEMBER 13, 2019 AT 11:15 AM

only asp.net Tutorials need not asp.net core

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ANANDHI M
SEPTEMBER 20, 2019 AT 6:08 PM

Can you add asp concepts too like all webform concepts including lambda expression and linq concepts?…It would be more greatful

Reply

DOT NET TUTORIALS
JUNE 12, 2020 AT 9:19 AM

Please have a look at the following link where we discussed lambda expression and all linq concepts in detail.
https://dotnettutorials.net/course/linq/

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SERGIO
OCTOBER 9, 2019 AT 12:45 AM

Thank you sir

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AJAY SRIRAM
OCTOBER 19, 2019 AT 12:16 PM

Waiting for latest updates..

Reply

SANDEEP K
NOVEMBER 20, 2019 AT 11:15 PM

Very nice explain in this app useful for dotnet developers

Reply

AMIN HUSSAIN
MARCH 2, 2020 AT 9:45 PM

Thank you very much making this useful staff and also the interview question it help me lots

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:24 PM

Thanks for your feedback. It means a lot to us.

Reply

RUPALI
MARCH 8, 2020 AT 3:13 PM

Content of every topics is so useful .I want to request u to pls share the contents of ADO.net and ASP.net also..

Reply

DOT NET TUTORIALS
MAY 9, 2020 AT 10:20 AM

Hi Rupali,
Here the link for the ado.net tutorials. As asp.net web form is going to be outdated, sorry to say you that I am going to write any articles on ASP.NET. Rather we will try to write articles on new and demand technologies.

https://dotnettutorials.net/course/ado-net-tutorial-for-beginners-and-professionals/

Reply

SUBHAS
MAY 4, 2020 AT 1:43 AM

The concepts are useful for performance tuning aspects also. Auto mapper very powerful to design domain driven related stuff.
If we are familiar with Lambda, complex collections (how to retrieve from complex type collection) with combination of Automapper, then we can easily implement any kind of logic w.r.t layering systems.
Here my question is: Automappers are internally defined from reflection logic(gettype comparison b/w classes and their properties?)...
Please continue your research on Architectural patterns and their evaluations start to till date (please explain successful patterns).

Happy coding

Reply

Getting more out of data with hybrid and edge technology
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Produced by EI Stuc

Sir, you are an amazing teacher! can't describe in words!! Thank you very much for your help and looking forward for the rest of articles.

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:24 PM

Thanks for your feedback. It means a lot to us.

Reply

RAMESH
AUGUST 27, 2020 AT 10:20 AM

Hi,
My name is ramesh. I would like to buy dotnet material books. Can get same material in books format. Kindly guide me. If possible please provide link.

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:24 PM

We don't have any books. Whatever we have, we published here.

Reply

VIMA THANGAM
NOVEMBER 19, 2020 AT 6:35 PM

Please do the tutorial for asp.net

Reply

MARY
JANUARY 10, 2021 AT 2:03 PM

could you please help me to get tutorials for events in c#?????

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:23 PM

Thanks for your feedback. Very soon we will add events and all missing topics.

Reply

MARY
JANUARY 10, 2021 AT 2:04 PM

could you please help me to get tutorials for ASP.NET in c#?????

Reply

AS
JANUARY 30, 2021 AT 5:57 AM

Sir please provide asp.net tutorial. Your way of explaining is very easy..sir .. please please a big request.

Reply

AMITY

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Reply

KETAN SHAH
NOVEMBER 10, 2021 AT 7:28 PM

Can u please add a ASP.NET Tutorials in C# it will help a lots of people who using this app

Reply

AYMAN
NOVEMBER 19, 2021 AT 5:21 PM

Please Add These topics “Nullable types, Events, dynamic type, ExpandoObject, File handling, Data Streams, Reflection”
and thanks for this articles

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:22 PM

Thanks for your feedback. Sure we will add these topics very soon.

Reply

VIMA
DECEMBER 24, 2021 AT 12:38 PM

I cracked many interviews after studying this material, which is easily understandable, very clear. Thank you so much

Reply

DOT NET TUTORIALS
MARCH 24, 2022 AT 7:21 PM

Thanks for your feedback. It means a lot to us.

Reply

VIMA
DECEMBER 24, 2021 AT 12:39 PM

Kindly add the ASP.Net tutorial

Reply

SURESH
DECEMBER 30, 2021 AT 11:19 AM

Nice!!!

Reply

SIVARAMAN
DECEMBER 30, 2021 AT 11:20 AM

Good.

Reply

SIVA
DECEMBER 30, 2021 AT 11:33 AM

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VIJAY
JANUARY 6, 2022 AT 6:32 PM

Nice Article!

Reply

SDFUG
JANUARY 11, 2022 AT 6:54 PM

Thank you

Reply

BRTHN
MARCH 2, 2022 AT 3:38 PM

event

Reply

SHAKEEL AHMED
APRIL 21, 2022 AT 11:53 AM

First I would like to thank Dotnet for sharing these materials. These are really good and up-to-the point and very understandable. Anyone with basic knowledge can also read these and increase their knowledge. It would be more convenient if we got a search option

Reply

DOT NET TUTORIALS
MAY 6, 2022 AT 9:48 AM

Thanks for your feedback and suggesstions. Definately we are going to provide a search option.

Reply

SIVA CHINCHALAPU
APRIL 28, 2022 AT 12:02 AM

I am just loving the way you are constantly working to update the content, for the ease of readers. Thank you for that.

Reply

DOT NET TUTORIALS
MAY 6, 2022 AT 9:47 AM

Thaks for your feedback.

Reply

SMITH
JULY 27, 2022 AT 8:52 PM

One-stop solutions for C#.NET. I learn Everything from here only. No need to go anywhere else. Basic and Advanced concepts are explained in depth.

Reply

DOT NET TUTORIALS
JULY 29, 2022 AT 5:23 PM

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YouTube Channel: https://www.youtube.com/c/DotNetTurorials

Reply

RAHUL
SEPTEMBER 15, 2022 AT 2:37 PM

The best site to learn c#. This site is better than so called MSDN.

Reply

ADVISOR
SEPTEMBER 16, 2022 AT 8:34 PM

Excelent work!! I just miss a tutorial about GUI (WindowsForms, WPF or MAUI).

Reply

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