

 免費電子書

學習

roslyn

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1: roslyn

Roslyn

- [API](#)
- [API](#)
- ◦

Examples

RoslynNuGet

- **CVB** - `Microsoft.Net.Compilers` ◦

```
nuget install Microsoft.Net.Compilers
```
- **API** - `Microsoft.CodeAnalysis` ◦

```
nuget install Microsoft.CodeAnalysis
```

.NETSDK◦

- **CVisual BasicCodeFix**◦
- **Visual StudioVisualizer** `View -> Other Windows -> Syntax Visualizer` ◦
- **Roslyn Quoter**

CAPI◦ ◦

-

Roslyn◦

roslyn <https://riptutorial.com/zh-TW/roslyn/topic/2905/roslyn>

2: Roslyn

Examples

C

- 1.
2. **NuGet**Microsoft.CodeAnalysis
3. Microsoft.CodeAnalysis.MSBuild System.LinqMicrosoft.CodeAnalysis.CSharp.Syntax
4. Main

```
// Declaring a variable with the current project file path.
const string projectPath = @"C:\<your path to the project\<project file name>.csproj";

// Creating a build workspace.
var workspace = MSBuildWorkspace.Create();

// Opening this project.
var project = workspace.OpenProjectAsync(projectPath).Result;

// Getting the compilation.
var compilation = project.GetCompilationAsync().Result;

// As this is a simple single file program, the first syntax tree will be the current file.
var syntaxTree = compilation.SyntaxTrees.First();

// Getting the root node of the file.
var rootSyntaxNode = syntaxTree.GetRootAsync().Result;

// Finding all the local variable declarations in this file and picking the first one.
var firstLocalVariablesDeclaration =
rootSyntaxNode.DescendantNodesAndSelf().OfType<LocalDeclarationStatementSyntax>().First();

// Getting the first declared variable in the declaration syntax.
var firstVariable = firstLocalVariablesDeclaration.Declaration.Variables.First();

// Getting the text of the initialized value.
var variableInitializer = firstVariable.Initializer.Value.GetFirstToken().ValueText;

// This will print to screen the value assigned to the projectPath variable.
Console.WriteLine(variableInitializer);

Console.ReadKey();
```

◦ ◦

C“Hello World”

```
Main Console.WriteLine("Hello World")
```

```
.csproj◦
```

```
Microsoft.CodeAnalysis NuGet
```

```

const string projectPath = @"C:\HelloWorldApplication\HelloWorldProject.csproj";

// Creating a build workspace.
var workspace = MSBuildWorkspace.Create();

// Opening the Hello World project.
var project = workspace.OpenProjectAsync(projectPath).Result;

// Getting the compilation.
var compilation = project.GetCompilationAsync().Result;

foreach (var tree in compilation.SyntaxTrees)
{
    Console.WriteLine(tree.FilePath);

    var rootSyntaxNode = tree.GetRootAsync().Result;

    foreach (var node in rootSyntaxNode.DescendantNodes())
    {
        Console.WriteLine($" *** {node.Kind()}");
        Console.WriteLine($"      {node}");
    }
}

Console.ReadKey();

```

Hello World ◦

VB.NET“Hello World”

Main Console.WriteLine("Hello World")

.vbproj◦

Microsoft.CodeAnalysis **NuGet**

```

Const projectPath = "C:\HelloWorldApplication\HelloWorldProject.vbproj"

' Creating a build workspace.
Dim workspace = MSBuildWorkspace.Create()

' Opening the Hello World project.
Dim project = workspace.OpenProjectAsync(projectPath).Result

' Getting the compilation.
Dim compilation = project.GetCompilationAsync().Result

For Each tree In compilation.SyntaxTrees

    Console.WriteLine(tree.FilePath)

    Dim rootSyntaxNode = tree.GetRootAsync().Result

    For Each node In rootSyntaxNode.DescendantNodes()

        Console.WriteLine($" *** {node.Kind()}")
        Console.WriteLine($"      {node}")
    Next

```

Next

```
Console.ReadKey()
```

Hello World ◦

C

```
var syntaxTree = CSharpSyntaxTree.ParseText(
    @"using System;
using System.Collections;
using System.Linq;
using System.Text;

namespace HelloWorldApplication
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Hello World");
        }
    }
}");

var root = syntaxTree.GetRoot() as CompilationUnitSyntax;

var namespaceSyntax = root.Members.OfType<NamespaceDeclarationSyntax>().First();

var programClassSyntax = namespaceSyntax.Members.OfType<ClassDeclarationSyntax>().First();

var mainMethodSyntax = programClassSyntax.Members.OfType<MethodDeclarationSyntax>().First();

Console.WriteLine(mainMethodSyntax.ToString());

Console.ReadKey();
```

Main◦

'var'

varSemanticModelGetSymbolInfo() ◦ MSBuildWorkspace◦ SyntaxRootSemanticModel VariableDeclarations
Type

```
var workspace = MSBuildWorkspace.Create();
var solution = workspace.OpenSolutionAsync("c:\\path\\to\\solution.sln").Result;

foreach (var document in solution.Projects.SelectMany(project => project.Documents))
{
    var rootNode = document.GetSyntaxRootAsync().Result;
    var semanticModel = document.GetSemanticModelAsync().Result;

    var variableDeclarations = rootNode
        .DescendantNodes()
        .OfType<LocalDeclarationStatementSyntax>();
    foreach (var varDeclaration in variableDeclarations)
```



```
{
    var symbolInfo = semanticModel.GetSymbolInfo(varDeclaration.Declaration.Type);
    var typeSymbol = symbolInfo.Symbol; // the type symbol for the variable..
}
```

Roslyn <https://riptutorial.com/zh-TW/roslyn/topic/4712/roslyn>

3: Roslyn

Roslyn

- Roslyn ReplaceNodes

Examples

C

PreviousAttributeReplacementAttribute

```
static async Task<bool> ModifySolution(string solutionPath)
{
    using (var workspace = MSBuildWorkspace.Create())
    {
        // Selects a Solution File
        var solution = await workspace.OpenSolutionAsync(solutionPath);
        // Iterates through every project
        foreach (var project in solution.Projects)
        {
            // Iterates through every file
            foreach (var document in project.Documents)
            {
                // Selects the syntax tree
                var syntaxTree = await document.GetSyntaxTreeAsync();
                var root = syntaxTree.GetRoot();
                // Finds all Attribute Declarations in the Document
                var existingAttributesList =
root.DescendantNodes().OfType<AttributeListSyntax>()
                // Where the Attribute is declared on a method
                .Where(curr => curr.Parent is MethodDeclarationSyntax)
                // And the attribute is named "PreviousAttribute"
                .Where(curr => curr.Attributes.Any(currentAttribute =>
currentAttribute.Name.GetText().ToString() == "PreviousAttribute"))
                .ToList();
                if (existingAttributesList.Any())
                {
                    // Generates a replacement for every attribute
                    var replacementAttribute = SyntaxFactory.AttributeList(
                        SyntaxFactory.SingletonSeparatedList(
SyntaxFactory.Attribute(SyntaxFactory.IdentifierName("ReplacementAttribute"),
                            SyntaxFactory.AttributeArgumentList(
                                SyntaxFactory.SeparatedList(new[]
                                {
                                    {
                                        SyntaxFactory.AttributeArgument(
                                            SyntaxFactory.LiteralExpression(
                                                SyntaxKind.StringLiteralExpression,
SyntaxFactory.Literal(@"Sample"))
                                        )
                                    }
                                }
                                )))))));
                    // Replaces all attributes at once.
                    // Note that you should not use root.ReplaceNode
                    // since it would only replace the first note
                }
            }
        }
    }
}
```

```

        root = root.ReplaceNodes(existingAttributesList, (node, n2) =>
replacementAttribute);
        // Exchanges the document in the solution by the newly generated
document
        solution = solution.WithDocumentSyntaxRoot(document.Id, root);
    }
}
// applies the changes to the solution
var result = workspace.TryApplyChanges(solution);
return result;
}
}

```

```

public class Program
{
    [PreviousAttribute()]
    static void Main(string[] args)
    {
    }
}

```

Method root.ReplaceNode◦◦

```

foreach(var node in existingAttributesList){
    root = root.ReplaceNode(node, replacementAttribute);
}

```

ReplaceNode◦ existingAttributesList◦◦

SyntaxRewriterC

“PreviousAttribute”“ReplacementAttribute”◦ SyntaxRewriter◦

```

/// <summary>
/// The CSharpSyntaxRewriter allows to rewrite the Syntax of a node
/// </summary>
public class AttributeStatementChanger : CSharpSyntaxRewriter
{
    /// Visited for all AttributeListSyntax nodes
    /// The method replaces all PreviousAttribute attributes annotating a method by
ReplacementAttribute attributes
    public override SyntaxNode VisitAttributeList(AttributeListSyntax node)
    {
        // If the parent is a MethodDeclaration (= the attribute annotates a method)
        if (node.Parent is MethodDeclarationSyntax &&
            // and if the attribute name is PreviousAttribute
            node.Attributes.Any(
                currentAttribute => currentAttribute.Name.GetText().ToString() ==
"PreviousAttribute"))
        {
            // Return an alternate node that is injected instead of the current node
            return SyntaxFactory.AttributeList(
                SyntaxFactory.SingletonSeparatedList(
                    SyntaxFactory.Attribute(SyntaxFactory.IdentifierName("ReplacementAttribute"),

```

```

        SyntaxFactory.AttributeArgumentList (
            SyntaxFactory.SeparatedList (new[]
            {
                SyntaxFactory.AttributeArgument (
                    SyntaxFactory.LiteralExpression (
                        SyntaxKind.StringLiteralExpression,
SyntaxFactory.Literal(@"Sample"))
                )
            }
            ))));
    }
    // Otherwise the node is left untouched
    return base.VisitAttributeList (node);
}
}

/// The method calling the Syntax Rewriter
private static async Task<bool> ModifySolutionUsingSyntaxRewriter (string solutionPath)
{
    using (var workspace = MSBuildWorkspace.Create ())
    {
        // Selects a Solution File
        var solution = await workspace.OpenSolutionAsync (solutionPath);
        // Iterates through every project
        foreach (var project in solution.Projects)
        {
            // Iterates through every file
            foreach (var document in project.Documents)
            {
                // Selects the syntax tree
                var syntaxTree = await document.GetSyntaxTreeAsync ();
                var root = syntaxTree.GetRoot ();

                // Generates the syntax rewriter
                var rewriter = new AttributeStatementChanger ();
                root = rewriter.Visit (root);

                // Exchanges the document in the solution by the newly generated document
                solution = solution.WithDocumentSyntaxRoot (document.Id, root);
            }
        }
        // applies the changes to the solution
        var result = workspace.TryApplyChanges (solution);
        return result;
    }
}

```

```

public class Program
{
    [PreviousAttribute()]
    static void Main (string[] args)
    {
    }
}

```

Roslyn <https://riptutorial.com/zh-TW/roslyn/topic/5221/roslyn>

4:

C.

- .NETMSBuild.

Examples

AdhocWorkspace.

AdhocWorkspaceAdhocWorkspace.

```
var workspace = new AdhocWorkspace();

string projectName = "HelloWorldProject";
ProjectId projectId = ProjectId.CreateNewId();
VersionStamp versionStamp = VersionStamp.Create();
ProjectInfo helloWorldProject = ProjectInfo.Create(projectId, versionStamp, projectName,
projectName, LanguageNames.CSharp);
SourceText sourceText = SourceText.From("class Program { static void Main() {
System.Console.WriteLine(\"HelloWorld\"); } }");

Project newProject = workspace.AddProject(helloWorldProject);
Document newDocument = workspace.AddDocument(newProject.Id, "Program.cs", sourceText);
```

MSBuildWorkspace

MSBuildWorkspaceMSBuild .sln .csproj .vbproj . .

```
string solutionPath = @"C:\Path\To\Solution\Sample.sln";

MSBuildWorkspace workspace = MSBuildWorkspace.Create();
Solution solution = await workspace.OpenSolutionAsync(nancyApp);

var allDocumentsInSolution = solution.Projects.SelectMany(x => x.Documents);
```

Visual StudioVisualStudioWorkspace

VisualStudioWorkspace. Visual Studio.

[YourVSPackage]Package.cs.

```
protected override void Initialize()
{
    // Additional code...

    var componentModel = (IComponentModel)this.GetService(typeof(SComponentModel));
    var workspace = componentModel.GetService<VisualStudioWorkspace>();
}
```

MEF

```
[Import(typeof(VisualStudioWorkspace))]  
public VisualStudioWorkspace ImportedWorkspace { get; set; }
```

VisualStudioWorkspace ◦

<https://riptutorial.com/zh-TW/roslyn/topic/9755/>

5:

RoslynSyntax API。 Visual BasicC。

- Roslyn。

Examples

。

Document。

```
Document document = ... // Get document from workspace or other source

var syntaxRoot = await document.GetSyntaxRootAsync();
```

LINQ

LINQ。 ClassDeclarationSyntaxA

```
var allClassesWithNameStartingWithA = syntaxRoot.DescendantNodes()
    .OfType<ClassDeclarationSyntax>()
    .Where(x => x.Identifier.ToString().StartsWith("A"));
```

```
var allClassesWithAttributes = syntaxRoot.DescendantNodes()
    .OfType<ClassDeclarationSyntax>()
    .Where(x => x.AttributeLists.Any(y => y.Attributes.Any()));
```

CSharpSyntaxWalker

CSharpSyntaxWalkerVisitor。 Syntax WalkerstructA

```
public class StructCollector : CSharpSyntaxWalker
{
    public StructCollector()
    {
        this.Structs = new List<StructDeclarationSyntax>();
    }

    public IList<StructDeclarationSyntax> Structs { get; }

    public override void VisitStructDeclaration(StructDeclarationSyntax node)
    {
        if (node.Identifier.ToString().StartsWith("A"))
        {
            this.Structs.Add(node);
        }
    }
}
```

SyntaxWalker

```
var structCollector = new StructCollector();  
structCollector.Visit(syntaxRoot); // Or any other syntax node  
Console.WriteLine($"The number of structs that have a name starting with the letter 'A' is  
{structCollector.Structs.Count}");
```

<https://riptutorial.com/zh-TW/roslyn/topic/9765/>

6:

Syntax API

-

Examples

semantic

- Document

```
Document document = ...;  
SemanticModel semanticModel = await document.GetSemanticModelAsync();
```

- Compilation

```
CSharpCompilation compilation = ...;  
var semanticModel = await compilation.GetSemanticModel(syntaxTree);
```

- AnalysisContext • DiagnosticAnalyzer

```
public override void Initialize(AnalysisContext context)  
{  
    context.RegisterSemanticModelAction(x =>  
    {  
        var semanticModel = x.SemanticModel;  
        // Do magical magic here.  
    });  
}
```

```
var syntaxRoot = await document.GetSyntaxRootAsync();  
  
var semanticModel = await document.GetSemanticModelAsync();  
var sampleMethodInvocation = syntaxRoot  
    .DescendantNodes()  
    .OfType<InvocationExpressionSyntax>()  
    .First();  
  
var sampleMethodSymbol = semanticModel.GetSymbolInfo(sampleMethodInvocation).Symbol;  
var referencesToSampleMethod = await SymbolFinder.FindReferencesAsync(sampleMethodSymbol,  
    document.Project.Solution);
```

<https://riptutorial.com/zh-TW/roslyn/topic/9772/>

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