

## LinksPlatform's Platform.RegularExpressions.Transformer Class Library

### 1.1 ./csharp/Platform.RegularExpressions.Transformer/Context.cs

```
1  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
2
3  namespace Platform.RegularExpressions.Transformer
4  {
5      public class Context : IContext
6      {
7          public string Path { get; }
8
9          public Context(string path) => Path = path;
10     }
11 }
```

### 1.2 ./csharp/Platform.RegularExpressions.Transformer/IContext.cs

```
1  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
2
3  namespace Platform.RegularExpressions.Transformer
4  {
5      public interface IContext
6      {
7          public string Path { get; }
8      }
9  }
```

### 1.3 ./csharp/Platform.RegularExpressions.Transformer/ISubstitutionRule.cs

```
1  using System.Text.RegularExpressions;
2
3  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
4
5  namespace Platform.RegularExpressions.Transformer
6  {
7      public interface ISubstitutionRule
8      {
9          Regex MatchPattern { get; }
10         string SubstitutionPattern { get; }
11         Regex PathPattern { get; }
12         int MaximumRepeatCount { get; }
13     }
14 }
```

### 1.4 ./csharp/Platform.RegularExpressions.Transformer/ITransformer.cs

```
1  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
2
3  namespace Platform.RegularExpressions.Transformer
4  {
5      public interface ITransformer
6      {
7          string Transform(string source, IContext context);
8      }
9  }
```

### 1.5 ./csharp/Platform.RegularExpressions.Transformer/RegexExtensions.cs

```
1  using System;
2  using System.Text.RegularExpressions;
3
4  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
5
6  namespace Platform.RegularExpressions.Transformer
7  {
8      public static class RegexExtensions
9      {
10         public static Regex OverrideOptions(this Regex regex, RegexOptions options, TimeSpan
            ↳ matchTimeout)
11         {
12             if (regex == null)
13             {
14                 return null;
15             }
16             return new Regex(regex.ToString(), options, matchTimeout);
17         }
18     }
19 }
```

## 1.6 ./csharp/Platform.RegularExpressions.Transformer/SubstitutionRule.cs

```

1  using System;
2  using System.Text;
3  using System.Text.RegularExpressions;
4
5  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7  namespace Platform.RegularExpressions.Transformer
8  {
9      public class SubstitutionRule : ISubstitutionRule
10     {
11         public static readonly TimeSpan DefaultMatchTimeout = TimeSpan.FromMinutes(5);
12         public static readonly RegexOptions DefaultMatchPatternRegexOptions =
13             ↳ RegexOptions.Compiled | RegexOptions.Multiline;
14         public static readonly RegexOptions DefaultPathPatternRegexOptions =
15             ↳ RegexOptions.Compiled | RegexOptions.Singleline;
16
17         public Regex MatchPattern { get; set; }
18
19         public string SubstitutionPattern { get; set; }
20
21         public Regex PathPattern { get; set; }
22
23         public int MaximumRepeatCount { get; set; }
24
25         public SubstitutionRule(Regex matchPattern, string substitutionPattern, Regex
26             ↳ pathPattern, int maximumRepeatCount, RegexOptions? matchPatternOptions,
27             ↳ RegexOptions? pathPatternOptions, TimeSpan? matchTimeout)
28         {
29             MatchPattern = matchPattern;
30             SubstitutionPattern = substitutionPattern;
31             PathPattern = pathPattern;
32             MaximumRepeatCount = maximumRepeatCount;
33             OverrideMatchPatternOptions(matchPatternOptions ?? matchPattern.Options,
34                 ↳ matchTimeout ?? matchPattern.MatchTimeout);
35             OverridePathPatternOptions(pathPatternOptions ?? pathPattern.Options, matchTimeout
36                 ↳ ?? pathPattern.MatchTimeout);
37         }
38
39         public SubstitutionRule(Regex matchPattern, string substitutionPattern, Regex
40             ↳ pathPattern, int maximumRepeatCount, bool useDefaultOptions) : this(matchPattern,
41             ↳ substitutionPattern, pathPattern, maximumRepeatCount, useDefaultOptions ?
42             ↳ DefaultMatchPatternRegexOptions : (RegexOptions?)null, useDefaultOptions ?
43             ↳ DefaultPathPatternRegexOptions : (RegexOptions?)null, useDefaultOptions ?
44             ↳ DefaultMatchTimeout : (TimeSpan?)null) { }
45
46         public SubstitutionRule(Regex matchPattern, string substitutionPattern, Regex
47             ↳ pathPattern, int maximumRepeatCount) : this(matchPattern, substitutionPattern,
48             ↳ pathPattern, maximumRepeatCount, true) { }
49
50         public SubstitutionRule(Regex matchPattern, string substitutionPattern, int
51             ↳ maximumRepeatCount) : this(matchPattern, substitutionPattern, null,
52             ↳ maximumRepeatCount) { }
53
54         public SubstitutionRule(Regex matchPattern, string substitutionPattern) :
55             ↳ this(matchPattern, substitutionPattern, null, 0) { }
56
57         public static implicit operator SubstitutionRule(ValueTuple<string, string> tuple) =>
58             ↳ new SubstitutionRule(new Regex(tuple.Item1), tuple.Item2);
59
60         public static implicit operator SubstitutionRule(ValueTuple<Regex, string> tuple) => new
61             ↳ SubstitutionRule(tuple.Item1, tuple.Item2);
62
63         public static implicit operator SubstitutionRule(ValueTuple<string, string, int> tuple)
64             ↳ => new SubstitutionRule(new Regex(tuple.Item1), tuple.Item2, tuple.Item3);
65
66         public static implicit operator SubstitutionRule(ValueTuple<Regex, string, int> tuple)
67             ↳ => new SubstitutionRule(tuple.Item1, tuple.Item2, tuple.Item3);
68
69         public static implicit operator SubstitutionRule(ValueTuple<string, string, Regex, int>
70             ↳ tuple) => new SubstitutionRule(new Regex(tuple.Item1), tuple.Item2, tuple.Item3,
71             ↳ tuple.Item4);
72
73         public static implicit operator SubstitutionRule(ValueTuple<Regex, string, Regex, int>
74             ↳ tuple) => new SubstitutionRule(tuple.Item1, tuple.Item2, tuple.Item3, tuple.Item4);
75
76         public void OverrideMatchPatternOptions(RegexOptions options, TimeSpan matchTimeout) =>
77             ↳ MatchPattern = MatchPattern.OverrideOptions(options, matchTimeout);

```

```

54
55 public void OverridePathPatternOptions(RegexOptions options, TimeSpan matchTimeout) =>
    ↳ PathPattern = PathPattern.OverrideOptions(options, matchTimeout);
56
57 public override string ToString()
58 {
59     var sb = new StringBuilder();
60     sb.Append('');
61     sb.Append(MatchPattern.ToString());
62     sb.Append('');
63     sb.Append(" -> ");
64     sb.Append('');
65     sb.Append(SubstitutionPattern);
66     sb.Append('');
67     if (PathPattern != null)
68     {
69         sb.Append(" on files ");
70         sb.Append('');
71         sb.Append(PathPattern.ToString());
72         sb.Append('');
73     }
74     if (MaximumRepeatCount > 0)
75     {
76         if (MaximumRepeatCount >= int.MaxValue)
77         {
78             sb.Append(" repeated forever");
79         }
80         else
81         {
82             sb.Append(" repeated up to ");
83             sb.Append(MaximumRepeatCount);
84             sb.Append(" times");
85         }
86     }
87     return sb.ToString();
88 }
89 }
90 }

```

## 1.7 ./csharp/Platform.RegularExpressions.Transformer/Transformer.cs

```

1 using System.Collections.Generic;
2 using System.Linq;
3
4 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
5
6 namespace Platform.RegularExpressions.Transformer
7 {
8     public class Transformer : ITransformer
9     {
10         private readonly IList<ISubstitutionRule> _substitutionRules;
11
12         public Transformer(IList<ISubstitutionRule> substitutionRules) => _substitutionRules =
            ↳ substitutionRules;
13
14         public string Transform(string source, IContext context)
15         {
16             var current = source;
17             var currentFilePath = context?.Path ?? "";
18             for (var i = 0; i < _substitutionRules.Count; i++)
19             {
20                 var rule = _substitutionRules[i];
21                 var matchPattern = rule.MatchPattern;
22                 var substitutionPattern = rule.SubstitutionPattern;
23                 var pathPattern = rule.PathPattern;
24                 var maximumRepeatCount = rule.MaximumRepeatCount;
25                 if (pathPattern == null || pathPattern.IsMatch(currentFilePath))
26                 {
27                     var replaceCount = 0;
28                     do
29                     {
30                         current = matchPattern.Replace(current, substitutionPattern);
31                         replaceCount++;
32                         if (maximumRepeatCount < int.MaxValue && replaceCount >
                            ↳ maximumRepeatCount)
33                         {
34                             break;
35                         }
36                     }
37                     while (matchPattern.IsMatch(current));

```

```

38     }
39 }
40 return current;
41 }
42
43 public IList<ITransformer> GenerateTransformersForEachRulesStep()
44 {
45     var transformers = new List<ITransformer>();
46     for (int i = 1; i <= _substitutionRules.Count; i++)
47     {
48         transformers.Add(new Transformer(_substitutionRules.Take(i).ToList()));
49     }
50     return transformers;
51 }
52 }
53 }

```

## 1.8 ./csharp/Platform.RegularExpressions.Transformer/TransformerCLI.cs

```

1 using System.Diagnostics;
2 using System.IO;
3 using System.Text;
4
5 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7 namespace Platform.RegularExpressions.Transformer
8 {
9     public class TransformerCLI
10     {
11         private readonly ITransformer _transformer;
12
13         public TransformerCLI(ITransformer transformer) => _transformer = transformer;
14
15         public bool Run(string[] args, out string message)
16         {
17             message = "";
18             var sourcePath = GetArgOrDefault(args, 0);
19             if (!File.Exists(sourcePath))
20             {
21                 message = $"{sourcePath} file does not exist.";
22                 return false;
23             }
24             var targetPath = GetArgOrDefault(args, 1);
25             if (string.IsNullOrEmpty(targetPath))
26             {
27                 targetPath = ChangeToTargetExtension(sourcePath);
28             }
29             else if (Directory.Exists(targetPath) &&
30                 ↪ File.GetAttributes(targetPath).HasFlag(FileAttributes.Directory))
31             {
32                 targetPath = Path.Combine(targetPath, GetTargetFileName(sourcePath));
33             }
34             else if (LooksLikeDirectoryPath(targetPath))
35             {
36                 Directory.CreateDirectory(targetPath);
37                 targetPath = Path.Combine(targetPath, GetTargetFileName(sourcePath));
38             }
39             if (File.Exists(targetPath))
40             {
41                 var applicationPath = Process.GetCurrentProcess().MainModule.FileName;
42                 var targetFileLastUpdateDateTime = new FileInfo(targetPath).LastWriteTimeUtc;
43                 if (new FileInfo(sourcePath).LastWriteTimeUtc < targetFileLastUpdateDateTime &&
44                     ↪ new FileInfo(applicationPath).LastWriteTimeUtc <
45                     ↪ targetFileLastUpdateDateTime)
46                 {
47                     return true;
48                 }
49             }
50             File.WriteAllText(targetPath, _transformer.Transform(File.ReadAllText(sourcePath,
51                 ↪ Encoding.UTF8), new Context(sourcePath), Encoding.UTF8));
52             message = $"{targetPath} file written.";
53             return true;
54         }
55
56         private static string GetTargetFileName(string sourcePath) =>
57             ↪ ChangeToTargetExtension(Path.GetFileName(sourcePath));
58
59         private static string ChangeToTargetExtension(string path) => Path.ChangeExtension(path,
60             ↪ ".cpp");
61     }
62 }

```

```

56     private static bool LooksLikeDirectoryPath(string targetPath) =>
        ↪ targetPath.EndsWith(Path.DirectorySeparatorChar.ToString()) ||
        ↪ targetPath.EndsWith(Path.AltDirectorySeparatorChar.ToString());
57
58     private static string GetArgOrDefault(string[] args, int index) => args.Length > index ?
        ↪ args[index] : null;
59 }
60 }

```

### 1.9 ./csharp/Platform.RegularExpressions.Transformer/TransformerExtensions.cs

```

1  using System.Collections.Generic;
2
3  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
4
5  namespace Platform.RegularExpressions.Transformer
6  {
7      public static class TransformerExtensions
8      {
9          public static List<string> GetSteps(this Transformer transformer, string source) =>
            ↪ transformer.GenerateTransformersForEachRulesStep().TransformWithAll(source);
10
11         public static void WriteStepsToFiles(this Transformer transformer, string sourcePath,
            ↪ string targetFilename, string targetExtension) => transformer.GenerateTransformersFo
            ↪ rEachRulesStep().TransformWithAllToFiles(sourcePath, targetFilename,
            ↪ targetExtension);
12     }
13 }

```

### 1.10 ./csharp/Platform.RegularExpressions.Transformer/TransformersListExtensions.cs

```

1  using System.IO;
2  using System.Collections.Generic;
3  using System.Text;
4
5  #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
6
7  namespace Platform.RegularExpressions.Transformer
8  {
9      public static class TransformersListExtensions
10     {
11         public static List<string> TransformWithAll(this IList<ITransformer> transformers,
            ↪ string source)
12         {
13             var strings = new List<string>();
14             if (transformers.Count > 0)
15             {
16                 for (int i = 0; i < transformers.Count; i++)
17                 {
18                     strings.Add(transformers[i].Transform(source, null));
19                 }
20             }
21             return strings;
22         }
23
24         public static void TransformWithAllToFiles(this IList<ITransformer> transformers, string
            ↪ sourcePath, string targetFilename, string targetExtension)
25         {
26             if (transformers.Count > 0)
27             {
28                 var sourceText = File.ReadAllText(sourcePath, Encoding.UTF8);
29                 var transformerContext = new Context(sourcePath);
30                 for (int i = 0; i < transformers.Count; i++)
31                 {
32                     var transformationOutput = transformers[i].Transform(sourceText,
                        ↪ transformerContext);
33                     File.WriteAllText($"{targetFilename}.{i}{targetExtension}",
                        ↪ transformationOutput, Encoding.UTF8);
34                 }
35             }
36         }
37     }
38 }

```

### 1.11 ./csharp/Platform.RegularExpressions.Transformer.Tests/MarkovAlgorithmsTests.cs

```

1  using System.Text.RegularExpressions;
2  using Xunit;
3
4  namespace Platform.RegularExpressions.Transformer.Tests
5  {

```

```

6 public class MarkovAlgorithmsTests
7 {
8     /// <remarks>
9     /// Example is from https://en.wikipedia.org/wiki/Markov_algorithm.
10    /// </remarks>
11    [Fact]
12    public void BinaryToUnaryNumbersTest()
13    {
14        var rules = new SubstitutionRule[]
15        {
16            ("1", "0|", int.MaxValue), // "1" -> "0|" repeated forever
17            // | symbol should be escaped for regular expression pattern, but not in the
18            // substitution pattern
19            ("0", "", int.MaxValue), // "0" -> "" repeated forever
20        };
21        var transformer = new Transformer(rules);
22        var input = "101";
23        var expectedOutput = "||||";
24        var output = transformer.Transform(input, null);
25        Assert.Equal(expectedOutput, output);
26    }
27 }
28 }

```

#### 1.12 ./csharp/Platform.RegularExpressions.Transformer.Tests/SubstitutionRuleTests.cs

```

1 using System.Text.RegularExpressions;
2 using Xunit;
3
4 namespace Platform.RegularExpressions.Transformer.Tests
5 {
6     public class SubstitutionRuleTests
7     {
8         [Fact]
9         public void OptionsOverrideTest()
10        {
11            SubstitutionRule rule = (new Regex(@"^\.s*?\.#pragma[\.sa-zA-Z0-9\.\/]+\$"), "", null, 0);
12            Assert.Equal(RegexOptions.Compiled | RegexOptions.Multiline,
13                rule.MatchPattern.Options);
14        }
15    }
16 }

```

#### 1.13 ./csharp/Platform.RegularExpressions.Transformer.Tests/TransformersTests.cs

```

1 using System.IO;
2 using System.Text;
3 using System.Text.RegularExpressions;
4 using Xunit;
5
6 namespace Platform.RegularExpressions.Transformer.Tests
7 {
8     public class TransformersTests
9     {
10        [Fact]
11        public void DebugOutputTest()
12        {
13            var rule1 = (new Regex("a"), "b");
14            var rule2 = (new Regex("b"), "c");
15
16            var sourceText = "aaaa";
17            var firstStepReferenceText = "bbbb";
18            var secondStepReferenceText = "cccc";
19
20            var transformer = new Transformer(new SubstitutionRule[] { rule1, rule2 });
21
22            var steps = transformer.GetSteps(sourceText);
23
24            Assert.Equal(2, steps.Count);
25            Assert.Equal(firstStepReferenceText, steps[0]);
26            Assert.Equal(secondStepReferenceText, steps[1]);
27        }
28
29        [Fact]
30        public void DebugFilesOutputTest()
31        {
32            var rule1 = (new Regex("a"), "b");
33            var rule2 = (new Regex("b"), "c");
34
35            var sourceText = "aaaa";

```

```

36     var firstStepReferenceText = "bbbb";
37     var secondStepReferenceText = "cccc";
38
39     var sourceFilename = Path.GetTempFileName();
40     File.WriteAllText(sourceFilename, sourceText, Encoding.UTF8);
41
42     var transformer = new Transformer(new SubstitutionRule[] { rule1, rule2 });
43
44     var targetFilename = Path.GetTempFileName();
45
46     transformer.WriteStepsToFiles(sourceFilename, targetFilename, ".txt");
47
48     var firstStepReferenceFilename = $"{targetFilename}.0.txt";
49     var secondStepReferenceFilename = $"{targetFilename}.1.txt";
50
51     Assert.True(File.Exists(firstStepReferenceFilename));
52     Assert.True(File.Exists(secondStepReferenceFilename));
53
54     Assert.Equal(firstStepReferenceText, File.ReadAllText(firstStepReferenceFilename,
55         ↪ Encoding.UTF8));
56     Assert.Equal(secondStepReferenceText, File.ReadAllText(secondStepReferenceFilename,
57         ↪ Encoding.UTF8));
58
59     File.Delete(sourceFilename);
60     File.Delete(firstStepReferenceFilename);
61     File.Delete(secondStepReferenceFilename);
62 }

```

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