

# LinksPlatform's Platform.RegularExpressions.Transformer Class Library

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

```
1 using System;
2 using System.Collections.Generic;
3 using System.Diagnostics;
4 using System.IO;
5 using System.Runtime.CompilerServices;
6 using System.Text;
7 using System.Threading.Tasks;
8
9 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
10
11 namespace Platform.RegularExpressions.Transformer
12 {
13     public class FileTransformer : IFileTransformer
14     {
15         protected readonly ITextTransformer _textTransformer;
16
17         public string SourceFileExtension
18         {
19             [MethodImpl(MethodImplOptions.AggressiveInlining)]
20             get;
21             [MethodImpl(MethodImplOptions.AggressiveInlining)]
22             private set;
23         }
24
25         public string TargetFileExtension
26         {
27             [MethodImpl(MethodImplOptions.AggressiveInlining)]
28             get;
29             [MethodImpl(MethodImplOptions.AggressiveInlining)]
30             private set;
31         }
32
33         public IList<ISubstitutionRule> Rules
34         {
35             [MethodImpl(MethodImplOptions.AggressiveInlining)]
36             get => _textTransformer.Rules;
37         }
38
39         [MethodImpl(MethodImplOptions.AggressiveInlining)]
40         public FileTransformer(ITextTransformer textTransformer, string sourceFileExtension,
41             → string targetFileExtension)
42         {
43             _textTransformer = textTransformer;
44             SourceFileExtension = sourceFileExtension;
45             TargetFileExtension = targetFileExtension;
46         }
47
48         [MethodImpl(MethodImplOptions.AggressiveInlining)]
49         public void Transform(string sourcePath, string targetPath)
50         {
51             var sourceDirectoryExists = DirectoryExists(sourcePath);
52             var sourceDirectoryPath = LooksLikeDirectoryPath(sourcePath);
53             var sourceIsDirectory = sourceDirectoryExists || sourceDirectoryPath;
54             var targetDirectoryExists = DirectoryExists(targetPath);
55             var targetDirectoryPath = LooksLikeDirectoryPath(targetPath);
56             var targetIsDirectory = targetDirectoryExists || targetDirectoryPath;
57             if (sourceIsDirectory && targetIsDirectory)
58             {
59                 // Folder -> Folder
60                 if (!sourceDirectoryExists)
61                 {
62                     return;
63                 }
64                 TransformFolder(sourcePath, targetPath);
65             }
66             else if (!(sourceIsDirectory || targetIsDirectory))
67             {
68                 // File -> File
69                 EnsureSourceFileExists(sourcePath);
70                 EnsureTargetFileDirectoryExists(targetPath);
71                 TransformFile(sourcePath, targetPath);
72             }
73             else if (targetIsDirectory)
74             {
75                 // File -> Folder
76                 EnsureSourceFileExists(sourcePath);
77                 EnsureTargetDirectoryExists(targetPath, targetDirectoryExists);
78                 TransformFile(sourcePath, GetTargetFileName(sourcePath, targetPath));
79             }
80         }
81     }
82 }
```

```

78     }
79     else
80     {
81         // Folder -> File
82         throw new NotSupportedException();
83     }
84 }
85
86 [MethodImpl(MethodImplOptions.AggressiveInlining)]
87 protected virtual void TransformFolder(string sourcePath, string targetPath)
88 {
89     if (CountFilesRecursively(sourcePath, SourceFileExtension) == 0)
90     {
91         return;
92     }
93     EnsureTargetDirectoryExists(targetPath);
94     var directories = Directory.GetDirectories(sourcePath);
95     for (var i = 0; i < directories.Length; i++)
96     {
97         var relativePath = GetRelativePath(sourcePath, directories[i]);
98         var newTargetPath = Path.Combine(targetPath, relativePath);
99         TransformFolder(directories[i], newTargetPath);
100     }
101     var files = Directory.GetFiles(sourcePath);
102     Parallel.For(0, files.Length, i =>
103     {
104         var file = files[i];
105         if (FileExtensionMatches(file, SourceFileExtension))
106         {
107             TransformFile(file, GetTargetFileName(file, targetPath));
108         }
109     });
110 }
111
112 [MethodImpl(MethodImplOptions.AggressiveInlining)]
113 protected virtual void TransformFile(string sourcePath, string targetPath)
114 {
115     if (File.Exists(targetPath))
116     {
117         var applicationPath = Process.GetCurrentProcess().MainModule.FileName;
118         var targetFileLastUpdateDateTime = new FileInfo(targetPath).LastWriteTimeUtc;
119         if (new FileInfo(sourcePath).LastWriteTimeUtc < targetFileLastUpdateDateTime &&
120             ↪ new FileInfo(applicationPath).LastWriteTimeUtc <
121             ↪ targetFileLastUpdateDateTime)
122         {
123             return;
124         }
125     }
126     var sourceText = File.ReadAllText(sourcePath, Encoding.UTF8);
127     var targetText = _textTransformer.Transform(sourceText);
128     File.WriteAllText(targetPath, targetText, Encoding.UTF8);
129 }
130
131 [MethodImpl(MethodImplOptions.AggressiveInlining)]
132 protected string GetTargetFileName(string sourcePath, string targetDirectory) =>
133     ↪ Path.ChangeExtension(Path.Combine(targetDirectory, Path.GetFileName(sourcePath)),
134     ↪ TargetFileExtension);
135
136 [MethodImpl(MethodImplOptions.AggressiveInlining)]
137 private static long CountFilesRecursively(string path, string extension)
138 {
139     var files = Directory.GetFiles(path);
140     var directories = Directory.GetDirectories(path);
141     var result = 0L;
142     for (var i = 0; i < directories.Length; i++)
143     {
144         result += CountFilesRecursively(directories[i], extension);
145     }
146     for (var i = 0; i < files.Length; i++)
147     {
148         if (FileExtensionMatches(files[i], extension))
149         {
150             result++;
151         }
152     }
153     return result;
154 }

```

```

152 [MethodImpl(MethodImplOptions.AggressiveInlining)]
153 private static bool FileExtensionMatches(string file, string extension) =>
    ↪ file.EndsWith(extension, StringComparison.OrdinalIgnoreCase);
154
155 [MethodImpl(MethodImplOptions.AggressiveInlining)]
156 private static void EnsureTargetFileDirectoryExists(string targetPath)
157 {
158     if (!File.Exists(targetPath))
159     {
160         EnsureDirectoryIsCreated(targetPath);
161     }
162 }
163
164 [MethodImpl(MethodImplOptions.AggressiveInlining)]
165 private static void EnsureTargetDirectoryExists(string targetPath) =>
    ↪ EnsureTargetDirectoryExists(targetPath, DirectoryExists(targetPath));
166
167 [MethodImpl(MethodImplOptions.AggressiveInlining)]
168 private static void EnsureTargetDirectoryExists(string targetPath, bool
    ↪ targetDirectoryExists)
169 {
170     if (!targetDirectoryExists)
171     {
172         Directory.CreateDirectory(targetPath);
173     }
174 }
175
176 [MethodImpl(MethodImplOptions.AggressiveInlining)]
177 private static void EnsureSourceFileExists(string sourcePath)
178 {
179     if (!File.Exists(sourcePath))
180     {
181         throw new FileNotFoundException("Source file does not exists.", sourcePath);
182     }
183 }
184
185 [MethodImpl(MethodImplOptions.AggressiveInlining)]
186 private static string NormalizePath(string path) => Path.GetFullPath(path).TrimEnd(new[]
    ↪ { Path.DirectorySeparatorChar, Path.AltDirectorySeparatorChar });
187
188 [MethodImpl(MethodImplOptions.AggressiveInlining)]
189 private static string GetRelativePath(string rootPath, string fullPath)
190 {
191     rootPath = NormalizePath(rootPath);
192     fullPath = NormalizePath(fullPath);
193     if (!fullPath.StartsWith(rootPath))
194     {
195         throw new Exception("Could not find rootPath in fullPath when calculating
            ↪ relative path.");
196     }
197     return fullPath.Substring(rootPath.Length + 1);
198 }
199
200 [MethodImpl(MethodImplOptions.AggressiveInlining)]
201 private static void EnsureDirectoryIsCreated(string targetPath) =>
    ↪ Directory.CreateDirectory(Path.GetDirectoryName(targetPath));
202
203 [MethodImpl(MethodImplOptions.AggressiveInlining)]
204 private static bool DirectoryExists(string path) => Directory.Exists(path) &&
    ↪ File.GetAttributes(path).HasFlag(FileAttributes.Directory);
205
206 [MethodImpl(MethodImplOptions.AggressiveInlining)]
207 private static bool LooksLikeDirectoryPath(string path) =>
    ↪ path.EndsWith(Path.DirectorySeparatorChar.ToString()) ||
    ↪ path.EndsWith(Path.AltDirectorySeparatorChar.ToString());
208 }
209 }

```

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

```

1 using System.Runtime.CompilerServices;
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 IFileTransformer : ITransformer
8     {
9         string SourceFileExtension

```

```

10     {
11         [MethodImpl(MethodImplOptions.AggressiveInlining)]
12         get;
13     }
14
15     string TargetFileExtension
16     {
17         [MethodImpl(MethodImplOptions.AggressiveInlining)]
18         get;
19     }
20
21     [MethodImpl(MethodImplOptions.AggressiveInlining)]
22     void Transform(string sourcePath, string targetPath);
23 }
24 }

```

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

```

1 using System.Runtime.CompilerServices;
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 interface ISubstitutionRule
9     {
10         Regex MatchPattern
11         {
12             [MethodImpl(MethodImplOptions.AggressiveInlining)]
13             get;
14         }
15
16         string SubstitutionPattern
17         {
18             [MethodImpl(MethodImplOptions.AggressiveInlining)]
19             get;
20         }
21
22         int MaximumRepeatCount
23         {
24             [MethodImpl(MethodImplOptions.AggressiveInlining)]
25             get;
26         }
27     }
28 }

```

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

```

1 using System.Runtime.CompilerServices;
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 ITextTransformer : ITransformer
8     {
9         [MethodImpl(MethodImplOptions.AggressiveInlining)]
10         string Transform(string sourceText);
11     }
12 }

```

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

```

1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Runtime.CompilerServices;
5 using Platform.Collections;
6
7 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
8
9 namespace Platform.RegularExpressions.Transformer
10 {
11     public static class ITextTransformerExtensions
12     {
13         [MethodImpl(MethodImplOptions.AggressiveInlining)]
14         public static IList<ITextTransformer> GenerateTransformersForEachRule(this
15             ↪ ITextTransformer transformer)
16         {
17             var transformers = new List<ITextTransformer>();
18             for (int i = 1; i <= transformer.Rules.Count; i++)
19             {

```

```

19         transformers.Add(new TextTransformer(transformer.Rules.Take(i).ToList()));
20     }
21     return transformers;
22 }
23
24 [MethodImpl(MethodImplOptions.AggressiveInlining)]
25 public static IList<string> GetSteps(this ITextTransformer transformer, string
    ↪ sourceText)
26 {
27     if (transformer != null && !transformer.Rules.IsNullOrEmpty())
28     {
29         var steps = new List<string>();
30         var steppedTransformer = new TextSteppedTransformer(transformer.Rules,
    ↪ sourceText);
31         while (steppedTransformer.Next())
32         {
33             steps.Add(steppedTransformer.Text);
34         }
35         return steps;
36     }
37     else
38     {
39         return Array.Empty<string>();
40     }
41 }
42
43 [MethodImpl(MethodImplOptions.AggressiveInlining)]
44 public static void WriteStepsToFiles(this ITextTransformer transformer, string
    ↪ sourceText, string targetPath, bool skipFilesWithNoChanges)
45 {
46     if (transformer != null && !transformer.Rules.IsNullOrEmpty())
47     {
48         targetPath.GetPathParts(out var directoryName, out var targetFilename, out var
    ↪ targetExtension);
49         var lastText = "";
50         var steppedTransformer = new TextSteppedTransformer(transformer.Rules,
    ↪ sourceText);
51         while (steppedTransformer.Next())
52         {
53             var newText = steppedTransformer.Text;
54             if (!(skipFilesWithNoChanges && string.Equals(lastText, newText)))
55             {
56                 lastText = newText;
57                 newText.WriteStepToFile(directoryName, targetFilename, targetExtension,
    ↪ steppedTransformer.Current);
58             }
59         }
60     }
61 }
62 }
63 }

```

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

```

1 using System;
2 using System.Collections.Generic;
3 using System.Runtime.CompilerServices;
4 using Platform.Collections;
5
6 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
7
8 namespace Platform.RegularExpressions.Transformer
9 {
10     public static class ITextTransformersListExtensions
11     {
12         [MethodImpl(MethodImplOptions.AggressiveInlining)]
13         public static IList<string> TransformWithAll(this IList<ITextTransformer> transformers,
    ↪ string source)
14         {
15             if (!transformers.IsNullOrEmpty())
16             {
17                 var steps = new List<string>();
18                 for (int i = 0; i < transformers.Count; i++)
19                 {
20                     steps.Add(transformers[i].Transform(source));
21                 }
22                 return steps;
23             }
24             else
25             {

```

```

26         return Array.Empty<string>();
27     }
28 }
29
30 [MethodImpl(MethodImplOptions.AggressiveInlining)]
31 public static void TransformWithAllToFiles(this IList<ITextTransformer> transformers,
32     ↪ string sourceText, string targetPath, bool skipFilesWithNoChanges)
33 {
34     if (!transformers.IsNullOrEmpty())
35     {
36         targetPath.GetPathParts(out var directoryName, out var targetFilename, out var
37             ↪ targetExtension);
38         var lastText = "";
39         for (int i = 0; i < transformers.Count; i++)
40         {
41             var transformationOutput = transformers[i].Transform(sourceText);
42             if (!(skipFilesWithNoChanges && string.Equals(lastText,
43                 ↪ transformationOutput)))
44             {
45                 lastText = transformationOutput;
46                 transformationOutput.WriteStepToFile(directoryName, targetFilename,
47                     ↪ targetExtension, i);
48             }
49         }
50     }
51 }
52 }
53 }
54 }
55 }
56 }
57 }
58 }
59 }
60 }
61 }
62 }
63 }
64 }
65 }
66 }
67 }
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81 }
82 }
83 }
84 }
85 }
86 }
87 }
88 }
89 }
90 }
91 }
92 }
93 }
94 }
95 }
96 }
97 }
98 }
99 }
100 }

```

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

```

1 using System.Collections.Generic;
2 using System.Runtime.CompilerServices;
3
4 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
5
6 namespace Platform.RegularExpressions.Transformer
7 {
8     public interface ITransformer
9     {
10         IList<ISubstitutionRule> Rules
11         {
12             [MethodImpl(MethodImplOptions.AggressiveInlining)]
13             get;
14         }
15     }
16 }

```

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

```

1 using System.IO;
2 using System.Runtime.CompilerServices;
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 LoggingFileTransformer : FileTransformer
10     {
11         [MethodImpl(MethodImplOptions.AggressiveInlining)]
12         public LoggingFileTransformer(ITextTransformer textTransformer, string
13             ↪ sourceFileExtension, string targetFileExtension) : base(textTransformer,
14             ↪ sourceFileExtension, targetFileExtension) { }
15
16         [MethodImpl(MethodImplOptions.AggressiveInlining)]
17         protected override void TransformFile(string sourcePath, string targetPath)
18         {
19             base.TransformFile(sourcePath, targetPath);
20             // Logging
21             var sourceText = File.ReadAllText(sourcePath, Encoding.UTF8);
22             _textTransformer.WriteStepsToFiles(sourceText, targetPath, skipFilesWithNoChanges:
23                 ↪ true);
24         }
25     }
26 }
27 }
28 }
29 }
30 }
31 }
32 }
33 }
34 }
35 }
36 }
37 }
38 }
39 }
40 }
41 }
42 }
43 }
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84 }
85 }
86 }
87 }
88 }
89 }
90 }
91 }
92 }
93 }
94 }
95 }
96 }
97 }
98 }
99 }
100 }

```

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

```

1 using System;
2 using System.Runtime.CompilerServices;

```

```

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 static class RegexExtensions
10    {
11        [MethodImpl(MethodImplOptions.AggressiveInlining)]
12        public static Regex OverrideOptions(this Regex regex, RegexOptions options, TimeSpan
            ↳ matchTimeout)
13        {
14            if (regex == null)
15            {
16                return null;
17            }
18            return new Regex(regex.ToString(), options, matchTimeout);
19        }
20    }
21 }

```

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

```

1 using System.IO;
2 using System.Runtime.CompilerServices;
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     internal static class StringExtensions
10    {
11        [MethodImpl(MethodImplOptions.AggressiveInlining)]
12        public static void GetPathParts(this string path, out string directoryName, out string
            ↳ targetFilename, out string targetExtension) => (directoryName, targetFilename,
            ↳ targetExtension) = (Path.GetDirectoryPath(path), Path.GetFileNameWithoutExtension(path), Path.GetExtension(path));
13
14        [MethodImpl(MethodImplOptions.AggressiveInlining)]
15        public static void WriteStepToFile(this string text, string directoryName, string
            ↳ targetFilename, string targetExtension, int currentStep) =>
            ↳ File.WriteAllText(Path.Combine(directoryName,
            ↳ $"{targetFilename}.{currentStep}{targetExtension}"), text, Encoding.UTF8);
16    }
17 }

```

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

```

1 using System;
2 using System.Runtime.CompilerServices;
3 using System.Text;
4 using System.Text.RegularExpressions;
5
6 #pragma warning disable CS1591 // Missing XML comment for publicly visible type or member
7
8 namespace Platform.RegularExpressions.Transformer
9 {
10    public class SubstitutionRule : ISubstitutionRule
11    {
12        public static readonly TimeSpan DefaultMatchTimeout = TimeSpan.FromMinutes(5);
13        public static readonly RegexOptions DefaultMatchPatternRegexOptions =
            ↳ RegexOptions.Compiled | RegexOptions.Multiline;
14
15        public Regex MatchPattern
16        {
17            [MethodImpl(MethodImplOptions.AggressiveInlining)]
18            get;
19            [MethodImpl(MethodImplOptions.AggressiveInlining)]
20            set;
21        }
22
23        public string SubstitutionPattern
24        {
25            [MethodImpl(MethodImplOptions.AggressiveInlining)]
26            get;
27            [MethodImpl(MethodImplOptions.AggressiveInlining)]
28            set;
29        }
30
31        public Regex PathPattern

```

```

32 {
33     [MethodImpl(MethodImplOptions.AggressiveInlining)]
34     get;
35     [MethodImpl(MethodImplOptions.AggressiveInlining)]
36     set;
37 }
38
39 public int MaximumRepeatCount
40 {
41     [MethodImpl(MethodImplOptions.AggressiveInlining)]
42     get;
43     [MethodImpl(MethodImplOptions.AggressiveInlining)]
44     set;
45 }
46
47 [MethodImpl(MethodImplOptions.AggressiveInlining)]
48 public SubstitutionRule(Regex matchPattern, string substitutionPattern, int
↳ maximumRepeatCount, RegexOptions? matchPatternOptions, TimeSpan? matchTimeout)
49 {
50     MatchPattern = matchPattern;
51     SubstitutionPattern = substitutionPattern;
52     MaximumRepeatCount = maximumRepeatCount;
53     OverrideMatchPatternOptions(matchPatternOptions ?? matchPattern.Options,
↳ matchTimeout ?? matchPattern.MatchTimeout);
54 }
55
56 [MethodImpl(MethodImplOptions.AggressiveInlining)]
57 public SubstitutionRule(Regex matchPattern, string substitutionPattern, int
↳ maximumRepeatCount, bool useDefaultOptions) : this(matchPattern,
↳ substitutionPattern, maximumRepeatCount, useDefaultOptions ?
↳ DefaultMatchPatternRegexOptions : (RegexOptions?)null, useDefaultOptions ?
↳ DefaultMatchTimeout : (TimeSpan?)null) { }
58
59 [MethodImpl(MethodImplOptions.AggressiveInlining)]
60 public SubstitutionRule(Regex matchPattern, string substitutionPattern, int
↳ maximumRepeatCount) : this(matchPattern, substitutionPattern, maximumRepeatCount,
↳ true) { }
61
62 [MethodImpl(MethodImplOptions.AggressiveInlining)]
63 public SubstitutionRule(Regex matchPattern, string substitutionPattern) :
↳ this(matchPattern, substitutionPattern, 0) { }
64
65 [MethodImpl(MethodImplOptions.AggressiveInlining)]
66 public static implicit operator SubstitutionRule(ValueTuple<string, string> tuple) =>
↳ new SubstitutionRule(new Regex(tuple.Item1), tuple.Item2);
67
68 [MethodImpl(MethodImplOptions.AggressiveInlining)]
69 public static implicit operator SubstitutionRule(ValueTuple<Regex, string> tuple) => new
↳ SubstitutionRule(tuple.Item1, tuple.Item2);
70
71 [MethodImpl(MethodImplOptions.AggressiveInlining)]
72 public static implicit operator SubstitutionRule(ValueTuple<string, string, int> tuple)
↳ => new SubstitutionRule(new Regex(tuple.Item1), tuple.Item2, tuple.Item3);
73
74 [MethodImpl(MethodImplOptions.AggressiveInlining)]
75 public static implicit operator SubstitutionRule(ValueTuple<Regex, string, int> tuple)
↳ => new SubstitutionRule(tuple.Item1, tuple.Item2, tuple.Item3);
76
77 [MethodImpl(MethodImplOptions.AggressiveInlining)]
78 public void OverrideMatchPatternOptions(RegexOptions options, TimeSpan matchTimeout) =>
↳ MatchPattern = MatchPattern.OverrideOptions(options, matchTimeout);
79
80 [MethodImpl(MethodImplOptions.AggressiveInlining)]
81 public void OverridePathPatternOptions(RegexOptions options, TimeSpan matchTimeout) =>
↳ PathPattern = PathPattern.OverrideOptions(options, matchTimeout);
82
83 [MethodImpl(MethodImplOptions.AggressiveInlining)]
84 public override string ToString()
85 {
86     var sb = new StringBuilder();
87     sb.Append(' ');
88     sb.Append(MatchPattern.ToString());
89     sb.Append(' ');
90     sb.Append(" -> ");
91     sb.Append(' ');
92     sb.Append(SubstitutionPattern);
93     sb.Append(' ');
94     if (PathPattern != null)

```



```

95     {
96         sb.Append(" on files ");
97         sb.Append(' ');
98         sb.Append(PathPattern.ToString());
99         sb.Append(' ');
100    }
101    if (MaximumRepeatCount > 0)
102    {
103        if (MaximumRepeatCount >= int.MaxValue)
104        {
105            sb.Append(" repeated forever");
106        }
107        else
108        {
109            sb.Append(" repeated up to ");
110            sb.Append(MaximumRepeatCount);
111            sb.Append(" times");
112        }
113    }
114    return sb.ToString();
115 }
116 }
117 }

```

## 1.12 ./csharp/Platform.RegularExpressions.Transformer/TextSteppedTransformer.cs

```

1  using System;
2  using System.Collections.Generic;
3  using System.Runtime.CompilerServices;
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 TextSteppedTransformer : ITransformer
10     {
11         public IList<ISubstitutionRule> Rules
12         {
13             [MethodImpl(MethodImplOptions.AggressiveInlining)]
14             get;
15             [MethodImpl(MethodImplOptions.AggressiveInlining)]
16             set;
17         }
18
19         public string Text
20         {
21             [MethodImpl(MethodImplOptions.AggressiveInlining)]
22             get;
23             [MethodImpl(MethodImplOptions.AggressiveInlining)]
24             set;
25         }
26
27         public int Current
28         {
29             [MethodImpl(MethodImplOptions.AggressiveInlining)]
30             get;
31             [MethodImpl(MethodImplOptions.AggressiveInlining)]
32             set;
33         }
34
35         [MethodImpl(MethodImplOptions.AggressiveInlining)]
36         public TextSteppedTransformer(IList<ISubstitutionRule> rules, string text, int current)
37             => Reset(rules, text, current);
38
39         [MethodImpl(MethodImplOptions.AggressiveInlining)]
40         public TextSteppedTransformer(IList<ISubstitutionRule> rules, string text) =>
41             Reset(rules, text);
42
43         [MethodImpl(MethodImplOptions.AggressiveInlining)]
44         public TextSteppedTransformer(IList<ISubstitutionRule> rules) => Reset(rules);
45
46         [MethodImpl(MethodImplOptions.AggressiveInlining)]
47         public TextSteppedTransformer() => Reset();
48
49         [MethodImpl(MethodImplOptions.AggressiveInlining)]
50         public void Reset(IList<ISubstitutionRule> rules, string text, int current)
51         {
52             Rules = rules;
53             Text = text;
54             Current = current;
55         }
56     }
57 }

```

```

54     [MethodImpl(MethodImplOptions.AggressiveInlining)]
55     public void Reset(IList<ISubstitutionRule> rules, string text) => Reset(rules, text, -1);
56
57     [MethodImpl(MethodImplOptions.AggressiveInlining)]
58     public void Reset(IList<ISubstitutionRule> rules) => Reset(rules, "", -1);
59
60     [MethodImpl(MethodImplOptions.AggressiveInlining)]
61     public void Reset(string text) => Reset(Rules, text, -1);
62
63     [MethodImpl(MethodImplOptions.AggressiveInlining)]
64     public void Reset() => Reset(Array.Empty<ISubstitutionRule>(), "", -1);
65
66     [MethodImpl(MethodImplOptions.AggressiveInlining)]
67     public bool Next()
68     {
69         var current = Current + 1;
70         if (current >= Rules.Count)
71         {
72             return false;
73         }
74         var rule = Rules[current];
75         var matchPattern = rule.MatchPattern;
76         var substitutionPattern = rule.SubstitutionPattern;
77         var maximumRepeatCount = rule.MaximumRepeatCount;
78         var replaceCount = 0;
79         var text = Text;
80         do
81         {
82             text = matchPattern.Replace(text, substitutionPattern);
83             replaceCount++;
84         }
85         while ((maximumRepeatCount == int.MaxValue || replaceCount <= maximumRepeatCount) &&
86             ↪ matchPattern.IsMatch(text));
87         Text = text;
88         Current = current;
89         return true;
90     }
91 }
92 }

```

### 1.13 ./csharp/Platform.RegularExpressions.Transformer/TextTransformer.cs

```

1  using System.Collections.Generic;
2  using System.Runtime.CompilerServices;
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 TextTransformer : ITextTransformer
9      {
10         private readonly TextSteppedTransformer _baseTransformer;
11
12         public IList<ISubstitutionRule> Rules
13         {
14             [MethodImpl(MethodImplOptions.AggressiveInlining)]
15             get;
16             [MethodImpl(MethodImplOptions.AggressiveInlining)]
17             private set;
18         }
19
20         [MethodImpl(MethodImplOptions.AggressiveInlining)]
21         public TextTransformer(IList<ISubstitutionRule> substitutionRules)
22         {
23             Rules = substitutionRules;
24             _baseTransformer = new TextSteppedTransformer(substitutionRules);
25         }
26
27         [MethodImpl(MethodImplOptions.AggressiveInlining)]
28         public string Transform(string source)
29         {
30             _baseTransformer.Reset(source);
31             while (_baseTransformer.Next());
32             return _baseTransformer.Text;
33         }
34     }
35 }

```

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

```

1  using System.Runtime.CompilerServices;
2  using Platform.Collections.Arrays;

```

```

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 TransformerCLI
9     {
10         private readonly IFileTransformer _transformer;
11
12         [MethodImpl(MethodImplOptions.AggressiveInlining)]
13         public TransformerCLI(IFileTransformer transformer) => _transformer = transformer;
14
15         [MethodImpl(MethodImplOptions.AggressiveInlining)]
16         public void Run(string[] args)
17         {
18             var sourcePath = args.GetElementOrDefault(0);
19             var targetPath = args.GetElementOrDefault(1);
20             _transformer.Transform(sourcePath, targetPath);
21         }
22     }
23 }

```

#### 1.15 ./csharp/Platform.RegularExpressions.Transformer.Tests/FileTransformerTests.cs

```

1 using System.IO;
2 using Xunit;
3
4 namespace Platform.RegularExpressions.Transformer.Tests
5 {
6     public class FileTransformerTests
7     {
8         [Fact]
9         public void FolderToFolderTransformationTest()
10        {
11            var tempPath = Path.GetTempPath();
12            var sourceFolderPath = Path.Combine(tempPath,
13                ↪ "FileTransformerTestsFolderToFolderTransformationTestSourceFolder");
14            var targetFolderPath = Path.Combine(tempPath,
15                ↪ "FileTransformerTestsFolderToFolderTransformationTestTargetFolder");
16
17            var baseTransformer = new TextTransformer(new SubstitutionRule[]
18            {
19                ("a", "b"),
20                ("b", "c")
21            });
22            var fileTransformer = new FileTransformer(baseTransformer, ".cs", ".cpp");
23
24            // Delete before creation (if previous test failed)
25            if (Directory.Exists(sourceFolderPath))
26            {
27                Directory.Delete(sourceFolderPath, true);
28            }
29            if (Directory.Exists(targetFolderPath))
30            {
31                Directory.Delete(targetFolderPath, true);
32            }
33
34            Directory.CreateDirectory(sourceFolderPath);
35            Directory.CreateDirectory(targetFolderPath);
36
37            File.WriteAllText(Path.Combine(sourceFolderPath, "a.cs"), "a a a");
38            var aFolderPath = Path.Combine(sourceFolderPath, "A");
39            Directory.CreateDirectory(aFolderPath);
40            Directory.CreateDirectory(Path.Combine(sourceFolderPath, "B"));
41            File.WriteAllText(Path.Combine(aFolderPath, "b.cs"), "b b b");
42            File.WriteAllText(Path.Combine(sourceFolderPath, "x.txt"), "should not be
43                ↪ translated");
44
45            fileTransformer.Transform(sourceFolderPath,
46                ↪ $"{targetFolderPath}{Path.DirectorySeparatorChar}");
47
48            var aCppFile = Path.Combine(targetFolderPath, "a.cpp");
49            Assert.True(File.Exists(aCppFile));
50            Assert.Equal("c c c", File.ReadAllText(aCppFile));
51            Assert.True(Directory.Exists(Path.Combine(targetFolderPath, "A")));
52            Assert.False(Directory.Exists(Path.Combine(targetFolderPath, "B")));
53            var bCppFile = Path.Combine(targetFolderPath, "A", "b.cpp");
54            Assert.True(File.Exists(bCppFile));
55            Assert.Equal("c c c", File.ReadAllText(bCppFile));
56            Assert.False(File.Exists(Path.Combine(targetFolderPath, "x.txt")));

```

```

53         Assert.False(File.Exists(Path.Combine(targetFolderPath, "x.cpp")));
54
55         Directory.Delete(sourceFolderPath, true);
56         Directory.Delete(targetFolderPath, true);
57     }
58 }
59 }

```

### 1.16 ./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", "0||", int.MaxValue), // @"\|0" -> "0||" repeated forever
20                 ("0", "", int.MaxValue), // "0" -> "" repeated forever
21             };
22             var transformer = new TextTransformer(rules);
23             var input = "101";
24             var expectedOutput = "||||";
25             var output = transformer.Transform(input);
26             Assert.Equal(expectedOutput, output);
27         }
28     }
29 }

```

### 1.17 ./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\/]+\$$"), "", 0);
12             Assert.Equal(RegexOptions.Compiled | RegexOptions.Multiline,
13                 ↳ rule.MatchPattern.Options);
14         }
15     }
16 }

```

### 1.18 ./csharp/Platform.RegularExpressions.Transformer.Tests/TextTransformerTests.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 TextTransformerTests
9      {
10         [Fact]
11         public void DebugOutputTest()
12         {
13             var sourceText = "aaaa";
14             var firstStepReferenceText = "bbbb";
15             var secondStepReferenceText = "cccc";
16
17             var transformer = new TextTransformer(new SubstitutionRule[] {
18                 (new Regex("a"), "b"),
19                 (new Regex("b"), "c")
20             });
21         }
22     }
23 }

```

```

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 sourceText = "aaaa";
33     var firstStepReferenceText = "bbbb";
34     var secondStepReferenceText = "cccc";
35
36     var transformer = new TextTransformer(new SubstitutionRule[] {
37         (new Regex("a"), "b"),
38         (new Regex("b"), "c")
39     });
40
41     var targetFilename = Path.GetTempFileName();
42
43     transformer.WriteStepsToFiles(sourceText, $"{targetFilename}.txt",
44         ↪ skipFilesWithNoChanges: false);
45
46     var firstStepReferenceFilename = $"{targetFilename}.0.txt";
47     var secondStepReferenceFilename = $"{targetFilename}.1.txt";
48
49     Assert.True(File.Exists(firstStepReferenceFilename));
50     Assert.True(File.Exists(secondStepReferenceFilename));
51
52     Assert.Equal(firstStepReferenceText, File.ReadAllText(firstStepReferenceFilename,
53         ↪ Encoding.UTF8));
54     Assert.Equal(secondStepReferenceText, File.ReadAllText(secondStepReferenceFilename,
55         ↪ Encoding.UTF8));
56
57     File.Delete(firstStepReferenceFilename);
58     File.Delete(secondStepReferenceFilename);
59 }
60
61 [Fact]
62 public void FilesWithNoChangesSkippedTest()
63 {
64     var sourceText = "aaaa";
65     var firstStepReferenceText = "bbbb";
66     var thirdStepReferenceText = "cccc";
67
68     var transformer = new TextTransformer(new SubstitutionRule[] {
69         (new Regex("a"), "b"),
70         (new Regex("x"), "y"),
71         (new Regex("b"), "c")
72     });
73
74     var targetFilename = Path.GetTempFileName();
75
76     transformer.WriteStepsToFiles(sourceText, $"{targetFilename}.txt",
77         ↪ skipFilesWithNoChanges: true);
78
79     var firstStepReferenceFilename = $"{targetFilename}.0.txt";
80     var secondStepReferenceFilename = $"{targetFilename}.1.txt";
81     var thirdStepReferenceFilename = $"{targetFilename}.2.txt";
82
83     Assert.True(File.Exists(firstStepReferenceFilename));
84     Assert.False(File.Exists(secondStepReferenceFilename));
85     Assert.True(File.Exists(thirdStepReferenceFilename));
86
87     Assert.Equal(firstStepReferenceText, File.ReadAllText(firstStepReferenceFilename,
88         ↪ Encoding.UTF8));
89     Assert.Equal(thirdStepReferenceText, File.ReadAllText(thirdStepReferenceFilename,
90         ↪ Encoding.UTF8));
91
92     File.Delete(firstStepReferenceFilename);
93     File.Delete(secondStepReferenceFilename);
94     File.Delete(thirdStepReferenceFilename);
95 }
96
97 [Fact]
98 public void DebugOutputUsingTransformersGenerationTest()
99 {
100     var sourceText = "aaaa";

```

```

95     var firstStepReferenceText = "bbbb";
96     var secondStepReferenceText = "cccc";
97
98     var transformer = new TextTransformer(new SubstitutionRule[] {
99         (new Regex("a"), "b"),
100         (new Regex("b"), "c")
101     });
102
103     var steps =
104         ↪ transformer.GenerateTransformersForEachRule().TransformWithAll(sourceText);
105
106     Assert.Equal(2, steps.Count);
107     Assert.Equal(firstStepReferenceText, steps[0]);
108     Assert.Equal(secondStepReferenceText, steps[1]);
109 }
110
111 [Fact]
112 public void DebugFilesOutputUsingTransformersGenerationTest()
113 {
114     var sourceText = "aaaa";
115     var firstStepReferenceText = "bbbb";
116     var secondStepReferenceText = "cccc";
117
118     var transformer = new TextTransformer(new SubstitutionRule[] {
119         (new Regex("a"), "b"),
120         (new Regex("b"), "c")
121     });
122
123     var targetFilename = Path.GetTempFileName();
124
125     transformer.GenerateTransformersForEachRule().TransformWithAllToFiles(sourceText,
126         ↪ $"{targetFilename}.txt", skipFilesWithNoChanges: false);
127
128     var firstStepReferenceFilename = $"{targetFilename}.0.txt";
129     var secondStepReferenceFilename = $"{targetFilename}.1.txt";
130
131     Assert.True(File.Exists(firstStepReferenceFilename));
132     Assert.True(File.Exists(secondStepReferenceFilename));
133
134     Assert.Equal(firstStepReferenceText, File.ReadAllText(firstStepReferenceFilename,
135         ↪ Encoding.UTF8));
136     Assert.Equal(secondStepReferenceText, File.ReadAllText(secondStepReferenceFilename,
137         ↪ Encoding.UTF8));
138
139     File.Delete(firstStepReferenceFilename);
140     File.Delete(secondStepReferenceFilename);
141 }
142
143 [Fact]
144 public void FilesWithNoChangesSkippedWhenUsingTransformersGenerationTest()
145 {
146     var sourceText = "aaaa";
147     var firstStepReferenceText = "bbbb";
148     var thirdStepReferenceText = "cccc";
149
150     var transformer = new TextTransformer(new SubstitutionRule[] {
151         (new Regex("a"), "b"),
152         (new Regex("x"), "y"),
153         (new Regex("b"), "c")
154     });
155
156     var targetFilename = Path.GetTempFileName();
157
158     transformer.GenerateTransformersForEachRule().TransformWithAllToFiles(sourceText,
159         ↪ $"{targetFilename}.txt", skipFilesWithNoChanges: true);
160
161     var firstStepReferenceFilename = $"{targetFilename}.0.txt";
162     var secondStepReferenceFilename = $"{targetFilename}.1.txt";
163     var thirdStepReferenceFilename = $"{targetFilename}.2.txt";
164
165     Assert.True(File.Exists(firstStepReferenceFilename));
166     Assert.False(File.Exists(secondStepReferenceFilename));
167     Assert.True(File.Exists(thirdStepReferenceFilename));
168
169     Assert.Equal(firstStepReferenceText, File.ReadAllText(firstStepReferenceFilename,
170         ↪ Encoding.UTF8));
171     Assert.Equal(thirdStepReferenceText, File.ReadAllText(thirdStepReferenceFilename,
172         ↪ Encoding.UTF8));

```

```
167         File.Delete(firstStepReferenceFilename);
168         File.Delete(secondStepReferenceFilename);
169         File.Delete(thirdStepReferenceFilename);
170     }
171 }
172 }
```

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