

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

1.1 ./Platform.RegularExpressions.Transformer.CSharpToCpp/CSharpToCppTransformer.cs

```

1  using System;
2  using System.Collections.Generic;
3  using System.Linq;
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.CSharpToCpp
9  {
10     public class CSharpToCppTransformer : Transformer
11     {
12         public static readonly IList

```

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58 (new Regex(@"Predicate<([a-zA-Z0-9]+)> ([a-zA-Z0-9]+)", "std::function<bool($1)>
    ↳ $2", null, 0),
59 // public static readonly EnsureAlwaysExtensionRoot Always = new
    ↳ EnsureAlwaysExtensionRoot();
60 // inline static EnsureAlwaysExtensionRoot Always;
61 (new Regex(@"public static readonly (?<type>[a-zA-Z0-9]+) (?<name>[a-zA-Z0-9_]+) =
    ↳ new \k<type>\(\);", "inline static ${type} ${name};", null, 0),
62 // public static readonly string ExceptionContentsSeparator = "----";
63 // inline static const char* ExceptionContentsSeparator = "----";
64 (new Regex(@"public static readonly string (?<name>[a-zA-Z0-9_]+) =
    ↳ ""(?<string>(\\"|\\\"|\\r\\n)+)"";", "inline static const char* ${name} =
    ↳ \"${string}\";", null, 0),
65 // private const int MaxPath = 92;
66 // static const int MaxPath = 92;
67 (new Regex(@"private (const|static readonly) ([a-zA-Z0-9]+) ([_a-zA-Z0-9]+) =
    ↳ ([^;\\r\\n]+);", "static const $2 $3 = $4;", null, 0),
68 // ArgumentNotNull(EnsureAlwaysExtensionRoot root, TArgument argument) where
    ↳ TArgument : class
69 // ArgumentNotNull(EnsureAlwaysExtensionRoot root, TArgument& argument)
70 (new Regex(@"(?<before> [a-zA-Z]+\\((([a-zA-Z *],+), |)) (?<type>[a-zA-Z]+) (?<after>(|
    ↳ [a-zA-Z *,]+)\\)) [\\r\\n]+where \k<type> : class)", "${before}${type}&${after}",
    ↳ null, 0),
71 // protected virtual
72 // virtual
73 (new Regex(@"protected virtual", "virtual", null, 0),
74 // protected abstract TElement GetFirst();
75 // virtual TElement GetFirst() = 0;
76 (new Regex(@"protected abstract ([^;\\r\\n]+);", "virtual $1 = 0;", null, 0),
77 // TElement GetFirst();
78 // virtual TElement GetFirst() = 0;
79 (new Regex(@"([\\r\\n]+[ ]+)((?!return)[a-zA-Z0-9]+ [a-zA-Z0-9]+\\([^\\)\\r\\n]*\\)) (;[
    ↳ ]*[\\r\\n]+)", "$1virtual $2 = 0$3", null, 1),
80 // public virtual
81 // virtual
82 (new Regex(@"public virtual", "virtual", null, 0),
83 // protected readonly
84 //
85 (new Regex(@"protected readonly ", "", null, 0),
86 // protected readonly TreeElement[] _elements;
87 // TreeElement _elements[N];
88 (new Regex(@"(protected|private) readonly ([a-zA-Z<>0-9]+)([\\[\\]]+)
    ↳ ([_a-zA-Z0-9]+);", "$2 $4[N];", null, 0),
89 // protected readonly TElement Zero;
90 // TElement Zero;
91 (new Regex(@"(protected|private) readonly ([a-zA-Z<>0-9]+) ([_a-zA-Z0-9]+);", "$2
    ↳ $3;", null, 0),
92 // private
93 //
94 (new Regex(@"(\\W)(private|protected|public|internal) "), "$1", null, 0),
95 // SizeBalancedTree(int capacity) => a = b;
96 // SizeBalancedTree(int capacity) { a = b; }
97 (new Regex(@"(^\\s+)(override) ?(void
    ↳ )?(\\[a-zA-Z0-9]+)\\(((\\^\\(\\r\\n)*\\)\\s+>\\s+([^;\\r\\n]+);", "$1$2$3$4($5) { $6; }",
    ↳ null, 0),
98 // int SizeBalancedTree(int capacity) => a;
99 // int SizeBalancedTree(int capacity) { return a; }
100 (new Regex(@"(^\\s+)(override) ?([a-zA-Z0-9]+
    ↳ )([_a-zA-Z0-9]+)\\(((\\^\\(\\r\\n)*\\)\\s+>\\s+([^;\\r\\n]+);", "$1$2$3$4($5) { return
    ↳ $6; }", null, 0),
101 // () => Integer<TElement>.Zero,
102 // () { return Integer<TElement>.Zero; },
103 (new Regex(@"\\(\\)\\s+>\\s+([^;\\r\\n]+?);", "() { return $1; }", null, 0),
104 // => Integer<TElement>.Zero;
105 // { return Integer<TElement>.Zero; }
106 (new Regex(@"\\)\\s+>\\s+([^;\\r\\n]+?);", ") { return $1; }", null, 0),
107 // () { return avlTree.Count; }
108 // [&]()-> auto { return avlTree.Count; }
109 (new Regex(@"", "\\(\\) { return ([^;\\r\\n]+); }", "", [&]()-> auto { return $1; }",
    ↳ null, 0),
110 // Count => GetSizeOrZero(Root);
111 // GetCount() { return GetSizeOrZero(Root); }
112 (new Regex(@"([A-Z][a-z]+)\\s+>\\s+([^;\\r\\n]+);", "Get$1() { return $2; }", null, 0),
113 // var
114 // auto
115 (new Regex(@"(\\W)var(\\W)", "$1auto$2", null, 0),
116 // unchecked

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117 //
118 (new Regex(@"[\r\n]{2}\s*?unchecked\s*?$"), "", null, 0),
119 // $"
120 // "
121 (new Regex(@"\$"""), "\"", null, 0),
122 // Console.WriteLine("...")
123 // printf("...\n")
124 (new Regex(@"Console.WriteLine\("""([^\r\n]+)""")"), "printf(\"$1\\n\")", null, 0),
125 // throw new InvalidOperationException
126 // throw std::exception
127 (new Regex(@"throw new (InvalidOperationException|Exception)"), "throw
→ std::exception", null, 0),
128 // override void PrintNode(TElement node, StringBuilder sb, int level)
129 // void PrintNode(TElement node, StringBuilder sb, int level) override
130 (new Regex(@"override ([a-zA-Z0-9 \*+])(\([^\\r\n]+?\))"), "$1$2 override", null,
→ 0),
131 // string
132 // char*
133 (new Regex(@"(\W)string(\W)"), "$1char*$2", null, 0),
134 // sbyte
135 // std::int8_t
136 (new Regex(@"(\W)sbyte(\W)"), "$1std::int8_t$2", null, 0),
137 // uint
138 // std::uint32_t
139 (new Regex(@"(\W)uint(\W)"), "$1std::uint32_t$2", null, 0),
140 // char*[] args
141 // char* args[]
142 (new Regex(@"([_a-zA-Z0-9:\*]?)\[ \] ([a-zA-Z0-9]+)"), "$1 $2[]", null, 0),
143 // @object
144 // object
145 (new Regex(@"@([_a-zA-Z0-9]+)"), "$1", null, 0),
146 // using Platform.Numbers;
147 //
148 (new Regex(@"([\r\n]{2}|^)\s*?using [\.a-zA-Z0-9]+\s*?$"), "", null, 0),
149 // struct TreeElement { }
150 // struct TreeElement { };
151 (new Regex(@"(struct|class) ([a-zA-Z0-9]+)(\s+){([\sa-zA-Z0-9;:_]+?)}([~;])"), "$1
→ $2$3{$4};$5", null, 0),
152 // class Program { }
153 // class Program { };
154 (new Regex(@"(struct|class) ([a-zA-Z0-9]+)[^\r\n]*([\r\n]+(?<indentLevel>[\t
→ ]*)?)\{([\S\s]+?[\r\n]+\k<indentLevel>)\}([~;]|$)"), "$1 $2$3{$4};$5", null, 0),
155 // class SizedBinaryTreeMethodsBase : GenericCollectionMethodsBase
156 // class SizedBinaryTreeMethodsBase : public GenericCollectionMethodsBase
157 (new Regex(@"class ([a-zA-Z0-9]+) : ([a-zA-Z0-9]+)"), "class $1 : public $2", null,
→ 0),
158 // class IProperty : ISetter<TValue, TObject>, IProvider<TValue, TObject>
159 // class IProperty : public ISetter<TValue, TObject>, IProvider<TValue, TObject>
160 (new Regex(@"(?<before>class [a-zA-Z0-9]+ : ((public [a-zA-Z0-9]+(<[a-zA-Z0-9
→ ,]+>)?, )+)?(?<inheritedType>(?!public) [a-zA-Z0-9]+(<[a-zA-Z0-9
→ ,]+>)?(?<after>(, [a-zA-Z0-9]+(?!>)|[ \r\n]+)))"), "${before}public
→ ${inheritedType}${after}", null, 10),
161 // Insert scope borders.
162 // ref TElement root
163 // ~!root!~ref TElement root
164 (new Regex(@"(?<definition>(?!<= | \() (ref [a-zA-Z0-9]+|[a-zA-Z0-9]+(?<!ref))
→ (?<variable>[a-zA-Z0-9]+)(?= \) |, | =))"), "~!${variable}!~${definition}", null,
→ 0),
165 // Inside the scope of ~!root!~ replace:
166 // root
167 // *root
168 (new Regex(@"(?<definition>~!(?<pointer>[a-zA-Z0-9]+)!~ref [a-zA-Z0-9]+
→ \k<pointer>(?! \) |, | =)) (?<before>((?!~! \k<pointer>!~) (. | \n) *)? ) (?<prefix>(\W
→ | \() ) \k<pointer> (?<suffix> ( | \) | ; | , ) )"),
→ "${definition}${before}${prefix}*${pointer}${suffix}", null, 70),
169 // Remove scope borders.
170 // ~!root!~
171 //
172 (new Regex(@"~!(?<pointer>[a-zA-Z0-9]+)!~"), "", null, 5),
173 // ref auto root = ref
174 // ref auto root =
175 (new Regex(@"ref ([a-zA-Z0-9]+) ([a-zA-Z0-9]+) = ref(\W)"), "$1* $2 = $3", null, 0),
176 // *root = ref left;
177 // root = left;
178 (new Regex(@"\*([a-zA-Z0-9]+) = ref ([a-zA-Z0-9]+)(\W)"), "$1 = $2$3", null, 0),
179 // (ref left)
180 // (left)

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181 (new Regex(@"\ref ([a-zA-Z0-9]+)\(|\(|,)", "($1$2", null, 0),
182 // ref TElement
183 // TElement*
184 (new Regex(@"\(|\(|\ref ([a-zA-Z0-9]+)", "$1$2* ", null, 0),
185 // ref sizeBalancedTree.Root
186 // &sizeBalancedTree->Root
187 (new Regex(@"\ref ([a-zA-Z0-9]+)\.([a-zA-Z0-9\*]+)", "&$1->$2", null, 0),
188 // ref GetElement(node).Right
189 // &GetElement(node)->Right
190 (new Regex(@"\ref ([a-zA-Z0-9]+)\((([a-zA-Z0-9\*]+)\)\.([a-zA-Z0-9]+)",
191     ↳ "&$1($2)->$3", null, 0),
192 // GetElement(node).Right
193 // GetElement(node)->Right
194 (new Regex(@"([a-zA-Z0-9]+)\((([a-zA-Z0-9\*]+)\)\.([a-zA-Z0-9]+)", "$1($2)->$3",
195     ↳ null, 0),
196 // [Fact]\npublic static void SizeBalancedTreeMultipleAttachAndDetachTest()
197 // TEST_METHOD(SizeBalancedTreeMultipleAttachAndDetachTest)
198 (new Regex(@"\[Fact\]\[s\n\]+(static )?void ([a-zA-Z0-9]+)\(|\(|)", "TEST_METHOD($2)",
199     ↳ null, 0),
200 // class TreesTests
201 // TEST_CLASS(TreesTests)
202 (new Regex(@"class ([a-zA-Z0-9]+)Tests)", "TEST_CLASS($1)", null, 0),
203 // Assert.Equal
204 // Assert::AreEqual
205 (new Regex(@"Assert\.Equal", "Assert::AreEqual", null, 0),
206 // TEElement Root;
207 // TEElement Root = 0;
208 (new Regex(@"(\r?\n[\t ]+)([a-zA-Z0-9:]+(?:<return>)) ([_a-zA-Z0-9]+);", "$1$2 $3 =
209     ↳ 0;", null, 0),
210 // TreeElement _elements[N];
211 // TreeElement _elements[N] = { {0} };
212 (new Regex(@"(\r?\n[\t ]+)([a-zA-Z0-9]+) ([_a-zA-Z0-9]+)\((([a-zA-Z0-9]+)\);",
213     ↳ "$1$2 $3[$4] = { {0} };", null, 0),
214 // auto path = new TEElement[MaxPath];
215 // TEElement path[MaxPath] = { {0} };
216 (new Regex(@"(\r?\n[\t ]+)[a-zA-Z0-9]+ ([a-zA-Z0-9]+) = new
217     ↳ ([a-zA-Z0-9]+)\((([a-zA-Z0-9]+)\);", "$1$3 $2[$4] = { {0} };", null, 0),
218 // Insert scope borders.
219 // auto added = new HashSet<TElement>();
220 // ~!added!~std::unordered_set<TElement> added;
221 (new Regex(@"auto (?<variable>[a-zA-Z0-9]+) = new
222     ↳ HashSet<(?<element>[a-zA-Z0-9]+)>\(|\(|)",
223     ↳ "~!${variable}!~std::unordered_set<${element}> ${variable};", null, 0),
224 // Inside the scope of ~!added!~ replace:
225 // added.Add(node)
226 // added.insert(node)
227 (new Regex(@"(?<scope>~!(?<variable>[a-zA-Z0-9]+)!~)(?<separator>.\|n)(?<before>((?<
228     ↳ !~!k<variable>!~)(.\|n)*?)\k<variable>\.Add\(((?<argument>[a-zA-Z0-9]+)\)|\(|",
229     ↳ "${scope}${separator}${before}${variable}.insert(${argument})", null, 10),
230 // Inside the scope of ~!added!~ replace:
231 // added.Remove(node)
232 // added.erase(node)
233 (new Regex(@"(?<scope>~!(?<variable>[a-zA-Z0-9]+)!~)(?<separator>.\|n)(?<before>((?<
234     ↳ !~!k<variable>!~)(.\|n)*?)\k<variable>\.Remove\(((?<argument>[a-zA-Z0-9]+)\)|\(|",
235     ↳ "${scope}${separator}${before}${variable}.erase(${argument})", null, 10),
236 // if (added.insert(node)) {
237 // if (!added.contains(node)) { added.insert(node);
238 (new Regex(@"if \(((?<variable>[a-zA-Z0-9]+)\.insert\(((?<argument>[a-zA-Z0-9]+)\)|\(|\(|(?
239     ↳ <separator>[\t ]*\r\n)+)(?<indent>[\t ]*){", "if
240     ↳ (!${variable}.contains(${argument})) ${separator}${indent}{ " +
241     ↳ Environment.NewLine + "${indent} ${variable}.insert(${argument});", null, 0),
242 // Remove scope borders.
243 // ~!added!~
244 //
245 (new Regex(@"~!(?<pointer>[a-zA-Z0-9]+)!~", "", null, 5),
246 // Insert scope borders.
247 // auto random = new System.Random(0);
248 // std::srand(0);
249 (new Regex(@"[a-zA-Z0-9\.] + ([a-zA-Z0-9]+) = new
250     ↳ (System\.)?Random\((([a-zA-Z0-9]+)\);", "~!$1!~std::srand($3);", null, 0),
251 // Inside the scope of ~!random!~ replace:
252 // random.Next(1, N)
253 // (std::rand() % N) + 1
254 (new Regex(@"(?<scope>~!(?<variable>[a-zA-Z0-9]+)!~)(?<separator>.\|n)(?<before>((?<
255     ↳ !~!k<variable>!~)(.\|n)*?)\k<variable>\.Next\(((?<from>[a-zA-Z0-9]+),
256     ↳ (?<to>[a-zA-Z0-9]+)\)|\(|", "${scope}${separator}${before}(std::rand() % ${to}) +
257     ↳ ${from}", null, 10),

```

```

239 // Remove scope borders.
240 // ~!random!~
241 //
242 (new Regex(@"~!(?<pointer>[a-zA-Z0-9]+)!~"), "", null, 5),
243 // Insert method body scope starts.
244 // void PrintNodes(TElement node, StringBuilder sb, int level) {
245 // void PrintNodes(TElement node, StringBuilder sb, int level) { /*method-start*/
246 (new Regex(@"(?<start>\r?\n[\t ]+)(?<prefix>((virtual )?[a-zA-Z0-9:_]+
    → )?)(?<method>[a-zA-Z][a-zA-Z0-9]*\(((?<arguments>[^\)]*)\)(?<override>(
    → override)?)(?<separator>[ \t\r\n]*)\{(?<end>[~])\}", "${start}${prefix}${method}"
    → (${arguments})${override}${separator}{/*method-start*/${end}", null,
    → 0),
247 // Insert method body scope ends.
248 // { /*method-start*/...}
249 // { /*method-start*/... /*method-end*/}
250 (new Regex(@"\{ /*method-start*/ (?<body>((?<bracket>\{) | (?<-bracket>\}) | [^\{\}]*)+ )
    → \}", "{ /*method-start*/ ${body} /*method-end*/}", null,
    → 0),
251 // Inside method bodies replace:
252 // GetFirst(
253 // this->GetFirst(
254 // (new Regex(@"(?<separator>(\(| |([W]) |return ))(?<!(->|\*
    → ))(?<method>(?!sizeof)[a-zA-Z0-9]+\(((?!\\) \{)"),
    → "${separator}this->${method}(", null, 1),
255 (new Regex(@"(?<scope>\/ /*method-start\/) (?<before>((?!\/ /*method-end\/) (.|\n))*?) (
    → ?<separator>[W] (?<!(\.:|\.|->)) (?<method>(?!sizeof)[a-zA-Z0-9]+\(((?!\\)
    → \{) (?<after>(.|\n))*?) (?<scopeEnd>\/ /*method-end\/)"),
    → "${scope}${before}${separator}this->${method}(${after}${scopeEnd}", null, 100),
256 // Remove scope borders.
257 // /*method-start*/
258 //
259 (new Regex(@"\/ /*method-(start|end)\/"), "", null, 0),
260 // throw new ArgumentNullException(argumentName, message);
261 // throw std::invalid_argument(((std::string)"Argument
    → ").append(argumentName).append(" is null: ").append(message).append("."));
262 (new Regex(@"throw new
    → ArgumentNullException\(((?<argument>[a-zA-Z]*[Aa]rgument[a-zA-Z]*),
    → (?<message>[a-zA-Z]*[Mm]essage[a-zA-Z]*))\);", "throw
    → std::invalid_argument(((std::string)"Argument \").append("${argument}").append("\
    → is null: \").append("${message}").append("\.\\"));", null, 0),
263 // throw new ArgumentException(message, argumentName);
264 // throw std::invalid_argument(((std::string)"Invalid
    → ").append(argumentName).append(" argument: ").append(message).append("."));
265 (new Regex(@"throw new ArgumentException\(((?<message>[a-zA-Z]*[Mm]essage[a-zA-Z]*),
    → (?<argument>[a-zA-Z]*[Aa]rgument[a-zA-Z]*))\);", "throw
    → std::invalid_argument(((std::string)"Invalid \").append("${argument}").append("\
    → argument: \").append("${message}").append("\.\\"));", null, 0),
266 // throw new NotSupportedException();
267 // throw std::logic_error("Not supported exception.");
268 (new Regex(@"throw new NotSupportedException\(\);", "throw std::logic_error(\"Not
    → supported exception.\");", null, 0),
269 // throw new NotImplementedException();
270 // throw std::logic_error("Not implemented exception.");
271 (new Regex(@"throw new NotImplementedException\(\);", "throw std::logic_error(\"Not
    → implemented exception.\");", null, 0),
272
273 }.Cast<ISubstitutionRule>().ToList();
274
275 public static readonly IList<ISubstitutionRule> LastStage = new List<SubstitutionRule>
276 {
277     // ICounter<int, int> c1;
278     // ICounter<int, int>* c1;
279     (new Regex(@"(?<abstractType>I[A-Z][a-zA-Z0-9]+(<[~>\r\n]+>))
    → (?<variable>[_a-zA-Z0-9]+);", "${abstractType}* ${variable};", null, 0),
280     // (expression)
281     // expression
282     (new Regex(@"(\(| )\((([a-zA-Z0-9_*.:]*)\)(, | |; |\\))"), "$1$2$3", null, 0),
283     // (method(expression))
284     // method(expression)
285     (new Regex(@"(?<firstSeparator>(\(|
    → ))\(((?<method>[a-zA-Z0-9_>]*:)+)\(((?<expression>((?<parenthesis>\(| (?<-parent
    → hesis>\)| [a-zA-Z0-9_>]*:)+)(?(parenthesis)(?!))\)\) (?<lastSeparator>(, |
    → |; |\\))"), "${firstSeparator}${method}(${expression})${lastSeparator}", null, 0),
286     // return ref _elements[node];
287     // return &_elements[node];

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288         (new Regex(@"return ref ([_a-zA-Z0-9]+)\([([_a-zA-Z0-9\*]+)\];", "return &$1[$2];",
289             ↪ null, 0),
290         // default
291         // 0
292         (new Regex(@"(\W)default(\W)", "${1}0$2", null, 0),
293         // // #define ENABLE_TREE_AUTO_DEBUG_AND_VALIDATION
294         //
295         (new Regex(@"\\\/[ \t]*#define[ \t]+[_a-zA-Z0-9]+[ \t]*"), "", null, 0),
296         // #if USEARRAYPOOL\r\n#endif
297         //
298         (new Regex(@"#if [_a-zA-Z0-9]+\s+endif"), "", null, 0),
299         // [Fact]
300         //
301         (new Regex(@"(?<firstNewLine>\r?\n|\A)(?<indent>[\t
302             ↪ ]+)\[[_a-zA-Z0-9]+\((?<expression>((?<parenthesis>\(|(?<-parenthesis>\)|\~()\r_
303             ↪ \n\*))+)(?<parenthesis>(?!))\)?\][ \t]*\(\r?\n\k<indent>?)"),
304             ↪ "${firstNewLine}${indent}", null, 5),
305         // \n ... namespace
306         // namespace
307         (new Regex(@"(\S[\r\n]{1,2})?[\r\n]+namespace"), "$1namespace", null, 0),
308         // \n ... class
309         // class
310         (new Regex(@"(\S[\r\n]{1,2})?[\r\n]+class"), "$1class", null, 0),
311     }.Cast<ISubstitutionRule>().ToList();
312
313     public CSharpToCppTransformer(IList<ISubstitutionRule> extraRules) :
314         ↪ base(FirstStage.Concat(extraRules).Concat(LastStage).ToList()) { }
315
316     public CSharpToCppTransformer() : base(FirstStage.Concat(LastStage).ToList()) { }
317 }
318 }

```

1.2 ./Platform.RegularExpressions.Transformer.CSharpToCpp.Tests/CSharpToCppTransformerTests.cs

```

1 using Xunit;
2
3 namespace Platform.RegularExpressions.Transformer.CSharpToCpp.Tests
4 {
5     public class CSharpToCppTransformerTests
6     {
7         [Fact]
8         public void HelloWorldTest()
9         {
10             const string helloWorldCode = @"using System;
11 class Program
12 {
13     public static void Main(string[] args)
14     {
15         Console.WriteLine("Hello, world!");
16     }
17 }";
18             const string expectedResult = @"class Program
19 {
20 public:
21 static void Main(char* args[])
22 {
23     printf("Hello, world!\n");
24 }
25 };";
26             var transformer = new CSharpToCppTransformer();
27             var actualResult = transformer.Transform(helloWorldCode, new Context(null));
28             Assert.Equal(expectedResult, actualResult);
29         }
30     }
31 }

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