StringInterpolation과 SwiftUI

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소개

- 現 카카오뱅크 iOS 개발자 (16.10 ~)
- 블로그 운영 : minsone.github.io

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- StringInterpolation 소개
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StringInterpolation

String Interpolation

하나 이상의 placeholders("\(variable)")를 포함하는 문자열 리터럴을 실행하여 placeholders를 해당 값으로 대체한 결과를 산출

```
let txt1 = "Hello"
let txt2 = "World"
"\(txt1), \(txt2)" // Output: "Hello, World"
```

```swift
let txt1 = "Hello"
let txt2 = "World"
"\(txt1), \(txt2)" // Output: "Hello, World"
```

```
1: ""
2: \(txt1) -> "Hello"
3: ", "
4: \(txt2) -> "World"
5: ""
```

결과: "Hello, World"

```swift
let txt1 = "Hello"
let txt2 = "World"
"\(txt1), \(txt2)" // Output: "Hello, World"
```

DefaultStringInterpolation

- Apple/Swift의 StringInterpolation.swift 공개

Extend StringInterpolation

기존의 StringInterpolation에 확장.

```
let amount = 10000
print("\(amount, style: .원)")
// Output: 10000원
```

```swift
enum Style { case 원 }

extension String.StringInterpolation {
  mutating func appendInterpolation
    (_ amount: Int, style: Style) {
    switch style {
    case .원: appendLiteral("\(amount)원")
    }
  }
}

let amount = 10000
print("\(amount, style: .원)")
// Output: 10000원
```

```swift
let amount = 10000

"\(amount, currency: .원화)"
"\(amount, currency: .유로)"
"\(amount, currency: .달러)"
"\(amount, currency: .위안)"

"\(amount.toCurrency(.원화))"
"\(amount.toCurrency(.유로))"
"\(amount.toCurrency(.달러))"
"\(amount.toCurrency(.위안))"
```

StringInterpolationProtocol

StringInterpolation을 구현하기 위한 프로토콜.

```
public protocol StringInterpolationProtocol {
  associatedtype StringLiteralType :
_ExpressibleByBuiltinStringLiteral
  init(literalCapacity: Int, interpolationCount: Int)
  mutating func appendLiteral(_ literal: Self.StringLiteralType)
}
```

```swift
struct CustomInterpolation: StringInterpolationProtocol {
  var str: String

  /// 초기화
  /// - Parameters:
  ///   - literalCapacity: 문자열 길이
  ///   - interpolationCount: 문자열 placeholder 개수
  init(literalCapacity: Int, interpolationCount: Int) {
    self.str = ""
  }

  mutating func appendLiteral(_ literal: String) {
    str += literal
  }

  mutating func appendInterpolation(_ amount: Int,
                                    style: Style) {
    switch style {
    case .원: appendLiteral("\(amount)원")
    }
  }
}
```

```
///    - literalCapacity: 문자열 길이
///    - interpolationCount: 문자열 placeholder 개수
init(literalCapacity: Int, interpolationCount: Int) {
  self.str = ""
}


let txt1 = "Hello"
let txt2 = "World"
"\(txt1), \(txt2)" // Output: "Hello, World"
```

literalCapacity = 2
interpolationCount = 2

```swift
struct CustomInterpolation: StringInterpolationProtocol {
  var str: String

  /// 초기화
  /// - Parameters:
  ///   - literalCapacity: 문자열 길이
  ///   - interpolationCount: 문자열 placeholder 개수
  init(literalCapacity: Int, interpolationCount: Int) {
    self.str = ""
  }

  mutating func appendLiteral(_ literal: String) {
    str += literal
  }

  mutating func appendInterpolation(_ amount: Int,
                                    style: Style) {
    switch style {
    case .원: appendLiteral("\(amount)원")
    }
  }
}
```

```
public protocol ExpressibleByStringInterpolation :
ExpressibleByStringLiteral {

    associatedtype StringInterpolation :
StringInterpolationProtocol =
DefaultStringInterpolation where Self.StringLiteralType
== Self.StringInterpolation.StringLiteralType

    init(stringInterpolation: Self.StringInterpolation)
}
```

```swift
struct WonStyleString: ExpressibleByStringInterpolation {
  var str = ""

  init(stringLiteral: String) {
    self.str = stringLiteral
  }

  init(stringInterpolation: CustomInterpolation) {
    self.str = stringInterpolation.str
  }
}

////////////////////////////////////////////////////////////

let styleStr: WonStyleString =
"\(10000, style: .원), \(20000, style: .원)"
styleStr.str // Output: "10000원, 20000원"
```

StringInterpolation을 이용한 RichString 만들기

NSAttributedString Library

SwiftRichString, BonMot, Atributika 와 같은 라이브러리를 통해 좀 더 손쉽게 NSAttributedString을 만들어줌.

```
let style = Style {
  $0.font = UIFont.systemFont(ofSize: 25)
  $0.color = UIColor.blue
  $0.alignment = .center
}

let attributedText = "Hello World!".set(style: style)
```

```
let style1 = Style {
  $0.font = UIFont.systemFont(ofSize: 25)
  $0.color = UIColor.blue
  $0.alignment = .center
}
let style2 = Style {
  $0.font = UIFont.systemFont(ofSize: 25)
  $0.color = UIColor.green
  $0.alignment = .center
}

let attr = NSMutableAttributedString(string: "")
attr.append("Hello ".set(style: style1))
attr.append("World".set(style: style2))
```

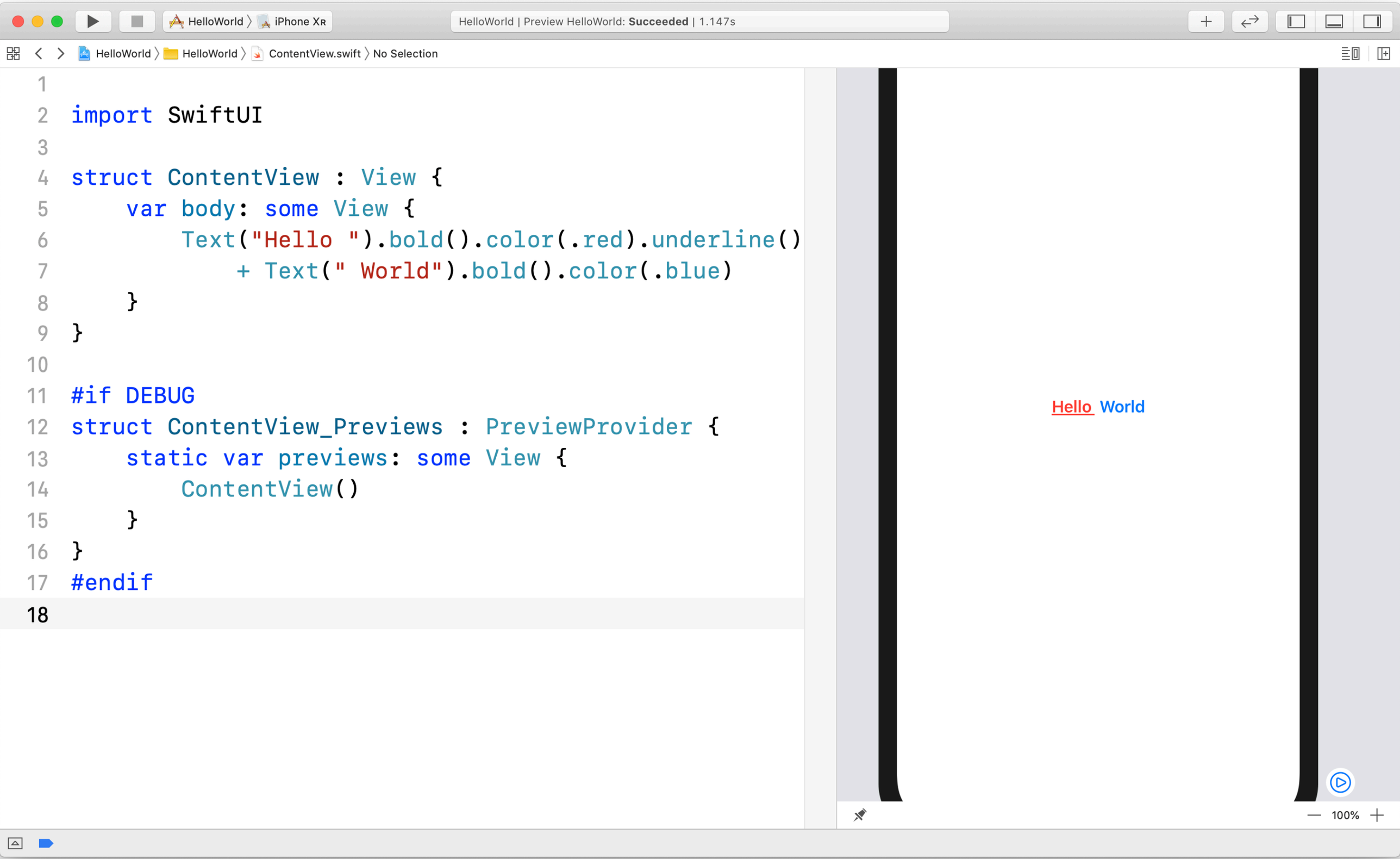
```
struct RichStringInterpolation: StringInterpolationProtocol {
  var attr: NSMutableAttributedString

  init(literalCapacity: Int, interpolationCount: Int) {
    self.attr = NSMutableAttributedString()
  }

  mutating func appendLiteral(_ literal: String) {
    attr.append(NSAttributedString(string: literal))
  }

  func appendInterpolation(_ string: String,
                           style: Style) {
    let attr: NSAttributedString = string.set(style: style)
    self.attr.append(attr)
  }
}
```

```
struct AttrString: ExpressibleByStringInterpolation {
  let attributedString: NSAttributedString

  init(stringLiteral: String) {
    let attr = NSAttributedString(string: stringLiteral)
    self.attributedString = attr
  }

  init(stringInterpolation: RichStringInterpolation) {
    self.attributedString = stringInterpolation.attr
  }
}

////////////////////////////////////////////////////////////

let attr: AttrString = """
\("Hello", style: style1), \("World", style: style2))
"""
let attrString: NSAttributedString = attr.attributedString
```

```
let attr: AttrString = """
\("Hello", style: style1), \("World", style: style2))
"""
let attrString: NSAttributedString = attr.attributedString
```

```
let attr = NSMutableAttributedString(string: "")
attr.append("Hello ".set(style: style1))
attr.append("World".set(style: style2))
```

SwiftUI을 이용한
RichString 만들기


HelloWorld
iPhone XR
HelloWorld | Preview HelloWorld: Succeeded | 1.147s
HelloWorld
HelloWorld
ContentView.swift
No Selection
1
2 import SwiftUI
3
4 struct ContentView : View {
5 var body: some View {
6 Text("Hello ").bold().color(.red).underline()
7 + Text(" World").bold().color(.blue)
8 }
9 }
10
11 #if DEBUG
12 struct ContentView_Previews : PreviewProvider {
13 static var previews: some View {
14 ContentView()
15 }
16 }
17 #endif
18
Hello World
100%

FunctionBuilder을 이용한 RichString 만들기

FunctionBuilder(Beta)

빌더 패턴을 좀 더 보기 쉽게 해주는 Annotation

```
struct ContentView : View {
    var body: some View {
        VStack {
            Text("Hello").bold().color(.blue)
            Text("World").bold().color(.red)
        }
    }
}
```

```
@_functionBuilder
struct NSAttributedStringBuilder {
    static func buildBlock(_ components: NSAttributedString...)
        -> NSAttributedString {
        let attr = NSMutableAttributedString(string: "")
        for component in components {
            attr.append(component)
        }
        return attr
    }
}

extension NSAttributedString {
    convenience init(@NSAttributedStringBuilder
        _ builder: () -> NSAttributedString) {
        self.init(attributedString: builder())
    }
}
```

```
NSAttributedString {
    "Hello ".set(style: style1)
    "World".set(style: style2)
}
```

```
NSAttributedString {
    "Hello ".set(style: style1); "World".set(style: style2)
}
```

QnA

Reference

- Apple : SE-0228 - Fix ExpressibleByStringInterpolation
- MSDN - Interpolation
- Wikipedia - String interpolation
- HackingWithSwift - What’s new in Swift 5.0