Codable

Giftbot

Codable

A type that can convert itself into and out of an external representation.

```
public typealias Codable = Decodable & Encodable

public protocol Encodable {

    /// Encodes this value into the given encoder.
    /// - Parameter encoder: The encoder to write data to.
    public func encode(to encoder: Encoder) throws
}

public protocol Decodable {

    /// Creates a new instance by decoding from the given decoder.
    /// - Parameter decoder: The decoder to read data from.
    public init(from decoder: Decoder) throws
}
```

Encoding & Decoding

[Encoding, 부호화]

- 정보의 형태나 형식을 표준화, 보안, 처리 속도 향상, 저장 공간 절약 등을 위해서 목적에 맞는 다른 형태나 형식으로 변환하는 처리 혹은 그 처리 방식.

- Encoder : 인코딩을 수행하는 장치나 회로, 컴퓨터 소프트웨어, 알고리즘

- A type that can encode values into a native format for external representation.

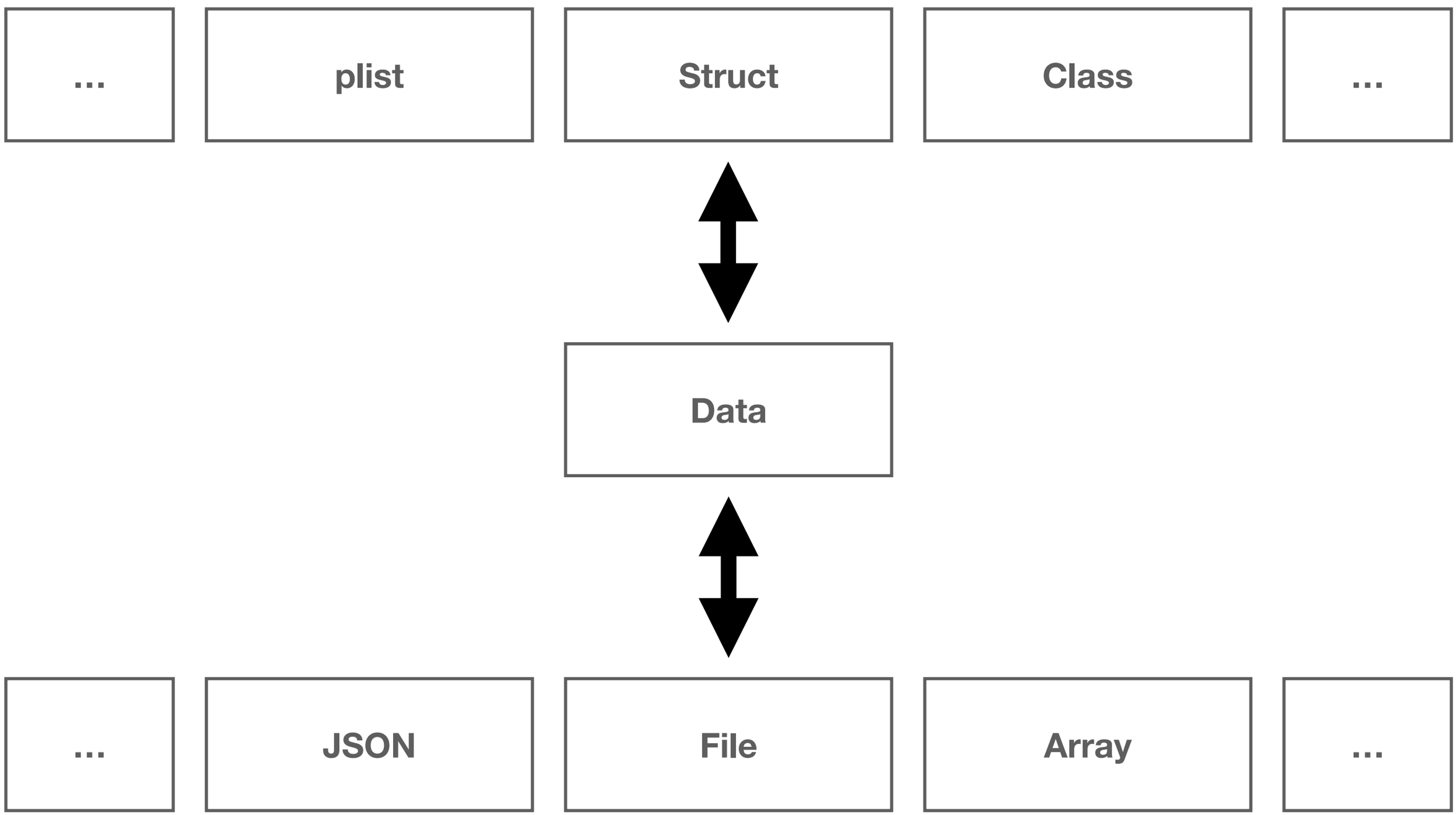
[Decoding, 복호화]

- Encoding(부호화)된 대상을 원래의 형태로 되돌리는 일

- 예를 들어, 압축 파일을 다시 풀거나 암호화된 내용을 원래 내용으로 되돌리는 일

- A type that can decode values from a native format into in-memory representations.

Encode & Decode



Built-in Decoder / Encoder

```
/// `PropertyListEncoder` facilitates the encoding of `Encodable` values
into property lists.
open class PropertyListEncoder { }

/// `PropertyListDecoder` facilitates the of property list values into
semantic `Decodable` types.
open class PropertyListDecoder { }


/// `JSONEncoder` facilitates the encoding of `Encodable` values
into JSON.
open class JSONEncoder { }

/// `JSONDecoder` facilitates the decoding of JSON into semantic
`Decodable` types.
open class JSONDecoder { }
```

Use Encoder

```
struct MacBook: Codable {
  let model: String
  let modelYear: Int
  let display: Int
}

let macBook = MacBook(
  model: "MacBook Pro", modelYear: 2020, display: 16
)

let encoder = JSONEncoder()
let encodedData = try! encoder.encode(macBook)
print(type(of: encodedData))   // Data
```

Use Decoder

```swift
let jsonData = """
{
  "model": "MacBook Pro",
  "modelYear": 2020,
  "display": 16,
}
""".data(using: .utf8)!

let decoder = JSONDecoder()
let decodedData = try! decoder.decode(
  MacBook.self, from: jsonData
)
print(type(of: decodedData))   // MacBook
```

SwiftyJSON

SwiftyJSON / SwiftyJSON

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The better way to deal with JSON data in Swift

swiftyjson | json | swift

689 commits | 5 branches | 23 releases | 124 contributors | MIT

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wongzigii Update README.md — Latest commit fb67763 on 8 Nov 2017

.github	Move files into .github directory	11 months ago
Example	Fix violations	3 months ago
Source	Fix SwiftLint violations	2 months ago
SwiftyJSON.xcodeproj	Fix broken path after renaming	4 months ago
SwiftyJSON.xcworkspace	Change example path for carthage. #276	3 years ago
Tests/SwiftyJSONTests	Fix SwiftLint violations	2 months ago

ObjectMapper

Hearst-DD / ObjectMapper

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Simple JSON Object mapping written in Swift

924 commits | 8 branches | 48 releases | 83 contributors | MIT

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tristanhimmelman Updated install versions in read me — Latest commit 883a6f1 15 days ago

.github	renamed github folder to github	11 months ago
ObjectMapper.xcodeproj	swift 4 no depreceted warnings	3 months ago
ObjectMapper.xcworkspace	Xcode 8 beta 4 changes..	2 years ago
Sources	swift 4 no depreceted warnings	3 months ago
Tests	Fix typo	3 months ago

Auto-synthesis example

```
struct User: Codable {
    var userName: String
    var score: Int
}
```

Auto-synthesis by compiler

```
struct User: Codable { // Auto-synthesis example
    var userName: String
    var score: Int

    @derived private enum CodingKeys: String, CodingKey { // @derived = auto-synthesized
        case userName
        case score
    }

    @derived init(from decoder: Decoder) throws {
        let container = try decoder.container(keyedBy: CodingKeys.self)
        userName = try container.decode(String.self, forKey: .userName)
        score = try container.decode(Int.self, forKey: .score)
    }

    @derived func encode(to encoder: Encoder) throws {
        var container = encoder.container(keyedBy: CodingKeys.self)
        try container.encode(userName, forKey: .userName)
        try container.encode(score, forKey: .score)
    }
}
```

Manual Implementation

```
struct User: Codable { // Manual implementation example
    var userName: String  // Let's say, JSON has "user_name" key
    var score: Int        // Let's limit to 0...100

    private enum CodingKeys: String, CodingKey {  // manual implementation
        case userName = "user_name"  // rename key
        case score
    }

    init(from decoder: Decoder) throws {  // manual implementation
        let container = try decoder.container(keyedBy: CodingKeys.self)
        score = try container.decode(Int.self, forKey: .score)
        guard (0...100).contains(score) else {  // add validation
            throw DecodingError.dataCorrupted(
                codingPath: container.codingPath + [CodingKeys.score],
                debugDescription: "score is not in range 0...100"
            )
        }
        userName = try container.decode(String.self, forKey: .userName)
    }
}
```

Basic

```
struct Dog: Decodable {
  let age: Int
  let name: String
}
```

Basic

```
let jsonData = """
{
  "age": 3,
  "name": "Tory"
}
""".data(using: .utf8)!

let dog = try? JSONDecoder().decode(Dog.self, from: jsonData)
print(dog)
```

Decode Manually

```
struct Dog: Decodable {
  let age: Int
  let name: String

  private enum CodingKeys: String, CodingKey {
    case age
    case name
  }

  init(from decoder: Decoder) throws {
    let values = try decoder.container(keyedBy: CodingKeys.self)
    age = try values.decode(Int.self, forKey: .age)
    name = try values.decode(String.self, forKey: .name)
  }
}
```

Array

```
let jsonData = """
[
  {
    "age": 3,
    "name": "Tory"
  },
  {
    "age": 3,
    "name": "Tory"
  }
]
""".data(using: .utf8)!

let dogs = try! JSONDecoder().decode([Dog].self, from: jsonData)
print(dogs)
```

Dictionary

```
let jsonData = """
{
  "first": {
    "age": 3,
    "name": "Tory"
  },
  "second": {
    "age": 3,
    "name": "Tory"
  }
}
""".data(using: .utf8)!

let decoder = JSONDecoder()
let dogs = try! decoder.decode([String: Dog].self, from: jsonData)
print(dogs)
```

Dictionary

```
let jsonData = """
{
  "latitude": 30.0,
  "longitude": 40.0,
  "additionalInfo": {
    "elevation": 50.0,
  }
}
""".data(using: .utf8)!

let decoder = JSONDecoder()
let coordinate = try! decoder.decode(Coordinate.self, from: jsonData)
print(coordinate)
```

Nested Keys

```
struct Coordinate {
  var latitude: Double
  var longitude: Double
  var elevation: Double

  enum CodingKeys: String, CodingKey {
    case latitude
    case longitude
    case additionalInfo
  }
  enum AdditionalInfoKeys: String, CodingKey {
    case elevation
  }
}
```

Nested Keys

```
extension Coordinate: Decodable {
  init(from decoder: Decoder) throws {
    let values = try decoder.container(keyedBy: CodingKeys.self)
    latitude = try values.decode(Double.self, forKey: .latitude)
    longitude = try values.decode(Double.self, forKey: .longitude)

    let additionalInfo = try values.nestedContainer(
      keyedBy: AdditionalInfoKeys.self, forKey: .additionalInfo
    )
    elevation = try additionalInfo.decode(
      Double.self, forKey: .elevation
    )
  }
}
```

Container Protocols

KeyedContainer - 딕셔너리 타입의 데이터에 사용

UnkeyedContainer - 배열 타입의 데이터에 사용

SingleValueContainer - 단일 값을 가진 데이터에 사용

EncodingError

```
/// An error that occurs during the encoding of a value.
public enum EncodingError : Error {
  /// 주어진 값으로 인코딩을 하지 못할 때
  case invalidValue(Any, EncodingError.Context)
}
```

DecodingError

```swift
/// An error that occurs during the decoding of a value.
public enum DecodingError : Error {
  /// 프로퍼티 타입 미스매치
  case typeMismatch(Any.Type, DecodingError.Context)
  /// 디코딩할 데이터의 키에 해당하는 Value 가 없을 경우
  case valueNotFound(Any.Type, DecodingError.Context)]
  /// 디코딩할 데이터에 지정한 키가 없는 경우
  case keyNotFound(CodingKey, DecodingError.Context)
  /// 데이터가 망가졌을 경우
  case dataCorrupted(DecodingError.Context)
}
```