Comparing Functional Programming in Go with Elixir

Jonas Jahns – jonas.jahns@stud.th-rosenheim.de – Version 1.0, Dec 21, 2020, Asciidoctor 1.5 article template

Table of Contents

Introduction

There are many programming languages. These programming languages can be combined into different types. For example object oriented languages like Java or Ruby.

Functional Programming

Go

Go is a multi-paradigm programming language.

> *Go is an open source programming language that makes it easy to build simple, reliable, and efficient software.*
>
> — *https://golang.org*

Elixir

In contrast to Go Elixir is a functional programming language. Elixir uses the

> *Elixir is a dynamic, functional language designed for building scalable and maintainable applications.*
>
> — *https://elixir-lang.org*

Comparison

Although Go is not a pure functional language it has many features of functional programming languages.

Table 1. Orthogonal Classifications

Go	**Elixir**
Static Typed	Dynamic Typed

Go	Elixir
Compiled	Compiled
Parallel	Sequential?
Static Linked	Dynamic Linked?
Safe	Safe
Platform Dependent Assemblercode	Platform Independent Bytecode

---

Functional Programming in Go

Lambda Calculus

lambda_calculus.go

```
func True(x Function) Function {
 return func(y Function) Function {
  return x
 }
}

func False(x Function) Function {
 return func(y Function) Function {
  return y
 }
}

func ID(x Function) Function {
 return x
}

// ...
```

Functional Programming in Elixir

Lambda Calculus

lambda_calculus.ex

```
true_fn = fn x ->
  fn _y -> x end
end

false_fn = fn _x ->
  fn y -> y end
end

id_fn = fn x -> x end

# ...
```

Comparison of Functional Programming

Example Application

First level heading

This is a paragraph with a **bold** word and an *italicized* word.

Figure 1. Image caption

This is another paragraph.[1]

Second level heading

Unordered list title

- list item 1
  - nested list item
    - nested nested list item 1
    - nested nested list item 2
- list item 2

This is a paragraph.

Example 1. Example block title

Content in an example block is subject to normal substitutions.

Sidebar title

Sidebars contain aside text and are subject to normal substitutions.

Third level heading

Listing block title

```
Content in a listing block is subject to verbatim substitutions.
Listing block content is commonly used to preserve code input.
```

Fourth level heading

Table 2. Table title

Column heading 1	**Column heading 2**
Column 1, row 1	Column 2, row 1
Column 1, row 2	Column 2, row 2

Fifth level heading

> *I am a block quote or a prose excerpt. I am subject to normal substitutions.*
>
> *—firstname lastname*
> *movie title*

I am a verse block.
  Indents and endlines are preserved in verse blocks.

—firstname lastname
poem title and more

First level heading

There are five admonition labels: Tip, Note, Important, Caution and Warning.

1. ordered list item
    a. nested ordered list item
2. ordered list item

The text at the end of this sentence is cross referenced to the third level heading

First level heading

This is a link to the Asciidoctor User Manual. This is an attribute reference which links this text to the Asciidoctor Quick Reference Guide.

1. I am footnote text and will be displayed at the bottom of the article.

Version 1.0
Last updated 2020-12-21 16:05:52 +0100