

Arrow - Kotlin FP Library

Thuy

Growth Session #18 - September 13-14 2018



What is Functional Programming?

- It is the process of building software by composing **pure functions**, avoiding **shared state**, **mutable data**, and **side-effects**
- All of languages that support **higher order function** are able to write code as FP

```
/**  
 * Map over Left and Right of this Either  
 */  
inline fun <C, D> bimap(leftOperation: (A) -> C, rightOperation: (B) -> D): Either<C, D> =  
    fold({ Left(leftOperation(it)) }, { Right(rightOperation(it)) })
```

Higher Order Function Example

What is Arrow?

- Arrow is a library for Typed Functional Programming in Kotlin.
- Arrow aims to provide the most popular interfaces and abstractions across Kotlin libraries.
 - Data types: **Option, Try, Either, etc**
 - Type classes: **Functor, Applicative, Monad**
 - Effects: **IO, Async**

To empower users to write pure FP apps and libraries built atop higher order abstractions

Beginning with FP

- I learn the concepts
 - **Either, Try, IO, etc**
 - **Monad**
- Apply to RP project in confirmation summary screen
 - Setup: **arrow-core, arrow-free, arrow-effects, arrow-instances**
 - Free Monad pattern
 - Not include testing yet

Monad is a design pattern that defines how functions, operations, inputs, and outputs can be used together to build generic types

- Free Monads is based on the idea of composing an AST (abstract syntax tree) of computations with type $\text{Free}\langle S, A \rangle$
- where S is your algebra, which will never depend on implementation details but on abstractions defined by an algebra
- An interpreter which will provide implementation details for the moment when the user decides to run the whole AST providing semantics to it
- A Monad instance to resolve all effects / perform execution of effects in a controlled context

Next Steps

- Testing
- Combine with RxJava
- Understand and practice more FP patterns

- FP concepts can be found in other languages like Scala or Haskell
- The hardest part is wrapping your head around all of the unfamiliar vocabulary. There are a lot of ideas you need to understand before you can begin.

- [Arrow document](#)
- [Arrow course](#)
- [Arrow videos](#)
- [Series Kotlin Functor, Monad, Applicative](#)
- [Monad and Free monad](#)
- [What is monad](#)

Thanks!

Contact Nimbl3

hello@nimbl3.com

399 Sukhumvit Road, Interchange 21
Klongtoey nua, Wattana
Bangkok 10110

20th Floor, Central Tower
28 Queen's Road
Central, Hong Kong

nimbl3.com

