10 Interesting things in Kotlin

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#1
Extension functions

- Works on decorator pattern
- Helps extends the functionality of the class
- No need to inherit the property
- Also works on property of the class

```kotlin
fun makeFirstCharacterCaps(s: String): String {
    return s.substring(0, 1).toUpperCase() +
            s.substring(1)
}
```

```kotlin
println(makeFirstCharacterCaps("kotlin"))
```

Kotlin

```kotlin
fun String.makeFirstCharacterCaps(): String {
   return this.substring(0, 1).toUpperCase() +
           this.substring(1)
}
```

```kotlin
println("kotlin".makeFirstCharacterCaps())
```

Kotlin

#2
Higher order functions and Lambdas

- Takes function as a parameters
- Can return result as function
- Can store result in a function

```
fun fetchEvenList(list: List<Int>): List<Int> {
    return list.filter { it % 2 == 0 }.toList()
}
```

```
fetchEvenList(mutableListOf(1, 2, 3, 4, 5, 6)).forEach {
    print(it)
}
```

```
2 4 6
```

```
fun fetchEvenList(list: List<Int>, eventList: (list: List<Int>) -> Unit) {
    val result = list.filter { it % 2 == 1 }.toList()
    eventList(result)
}
```

```
fetchEvenList(mutableListOf(1, 2, 3, 4, 5, 6)) { it ->
    it.forEach { print(it) }
}
```

```
2 4 6
```

- Lambda expression are **function literal**
- Surrounded by curly braces { }

```
fun fetchEvenList(list: List<Int>): List<Int> {
    return list.filter { it % 2 == 0 }.toList()
}
```

Let’s combine all of them

```
fun List<Int>.fetchEventList(eventList: (list: List<Int>) -> Unit) {
    eventList(this.filter { it % 2 == 0 }.toList())
}
```

#3
Inline functions

- Body of the function get in-lined with code
- Reduces memory overhead
- Works well for smaller and repeated function body
- Needs **inline** keyword on the function

```
fun String.capsFirsCharacter(caps: (result: String) -> Unit){
    caps(this.substring(0, 1).toUpperCase())
}
```

```
"kotlin".capsFirsCharacter {
    println(it)
}
```

```
public final class KotlinPresentationKt {
   public static final void main(@NotNull String[] args) {
      capsFirsCharacter("kotlin", (Function1)null.INSTANCE);
    }

   public static final void capsFirsCharacter(@NotNull String $this$capsFirsCharacter, @NotNull Function1 
caps) {
      ...
      String var10001 = $this$capsFirsCharacter.substring(var3, var4);
        ...
   }
```

```
inline fun String.capsFirsCharacter(caps: (result: String) -> Unit){
    caps(this.substring(0, 1).toUpperCase())
}
```

```
"kotlin".capsFirsCharacter {
    println(it)
}
```

```
public final class KotlinPresentationKt {
    public static final void main(@NotNull String[] args) {
        ...
        String var10000 = $this$capsFirsCharacter$iv.substring(var4, var5);
        ...
    }
}
```

#4
Delegates

- Transfer the request to helpers to serve

- Kotlin does using **by** keyword on classes + properties

```
interface Base {
    fun print()
}


class Concrete(val s: String): Base {
    override fun print() {
        println(s)
    }
}


class Delegate(d: Base): Base by d
```

```
Delegate(Concrete("kotlin")).print()
```

```
kotlin
```

```
val tvMobile by lazy {
    findViewById(R.id.mobile_tv) as TextView
}
```

```
var name : String by notNull()
```

#5
Destructuring declaration

```
data class Customer(val name: String, val mobile: String)

val (name, mobile) = Customer("Kotlin", "70210***64")

println(name)                    Kotlin
println(mobile)              70210***64
```

```
val (name) = Customer("Kotlin", "70210***64")
println(name)                    Kotlin
```

```
val customer = Customer("Kotlin", "70210***64")

println(customer.component1())              Kotlin
println(customer.component2())               70210***64
```

#6
Collections

- Kotlin collections are very comprehensive
- Some common includes list, set, and maps
- Located in **kotlin.collections** package

```
 val set = setOf("android", "ios", "web", "four")
 var emptySet = mutableSetOf<String>()


val map = mapOf("name" to "kotlin", "mobile" to "70210***64")
val emptyMap = mutableMapOf<String, String>()


val squared = MutableList(3) { it * it }
println(squared)                [0, 1, 4]
```

```kotlin
val platforms = listOf("android", "ios", "web", "windows")

val languages = listOf("kotlin", "swift", "react")

println(platforms.zip(languages))
```

```
[(android, kotlin), (ios, swift), (web, react)]
```

```kotlin
val platforms = listOf("android", "ios", "web", "windows")

println(platforms.associateBy { it.first().toUpperCase() })
```

```
{A=android, I=ios, W=windows}
```

```kotlin
println(platforms.associateBy(keySelector = { it.first().toUpperCase() }, valueTransform =
{ it.length < 4 }))
```

```
{A=false, I=true, W=false}
```

7
Couroutines

- Patterns to simplify the asynchronous style of code

- Help reduce overhead of long running task blocking mainthread or Main Safe

- Lightweight

- Uses dispatcher MAIN, IO,DEFAULT to identify threads

How to start ?

```
override fun onCreate(savedInstanceState: Bundle?) {
   super.onCreate(savedInstanceState)

   GlobalScope.launch(Dispatchers.Main) {
      triggerApiAndDisplay()
   }

}
```

```
suspend fun triggerApiAndDisplay(){
   val apiResult = triggerApi()
   display(apiResult)
}
```

```
// Non Blocking API
suspend fun triggerApi()=
   withContext(Dispatcher.IO) {
      ..
   }
}
```

```
# display on Main
fun display() {
    ..
}
```

#8
Scope functions

- Makes code more concise and easier to write
- Usage depends on adoption and selection by developers in project
- Like .let {}, .apply{}, .run {}, with{}, also {}

Function	Object reference	Return value	Is extension function
`let`	`it`	Lambda result	Yes
`run`	`this`	Lambda result	Yes
`run`	-	Lambda result	No: called without the context object
`with`	`this`	Lambda result	No: takes the context object as an argument.
`apply`	`this`	Context object	Yes
`also`	`it`	Context object	Yes

```
val customer = Customer("kotlin", "70210***64")
       .apply { this.name = this.name.capsFirsCharacter() }

println(customer)
```

```
Customer(name=Kotlin, mobile=70210***64)
```

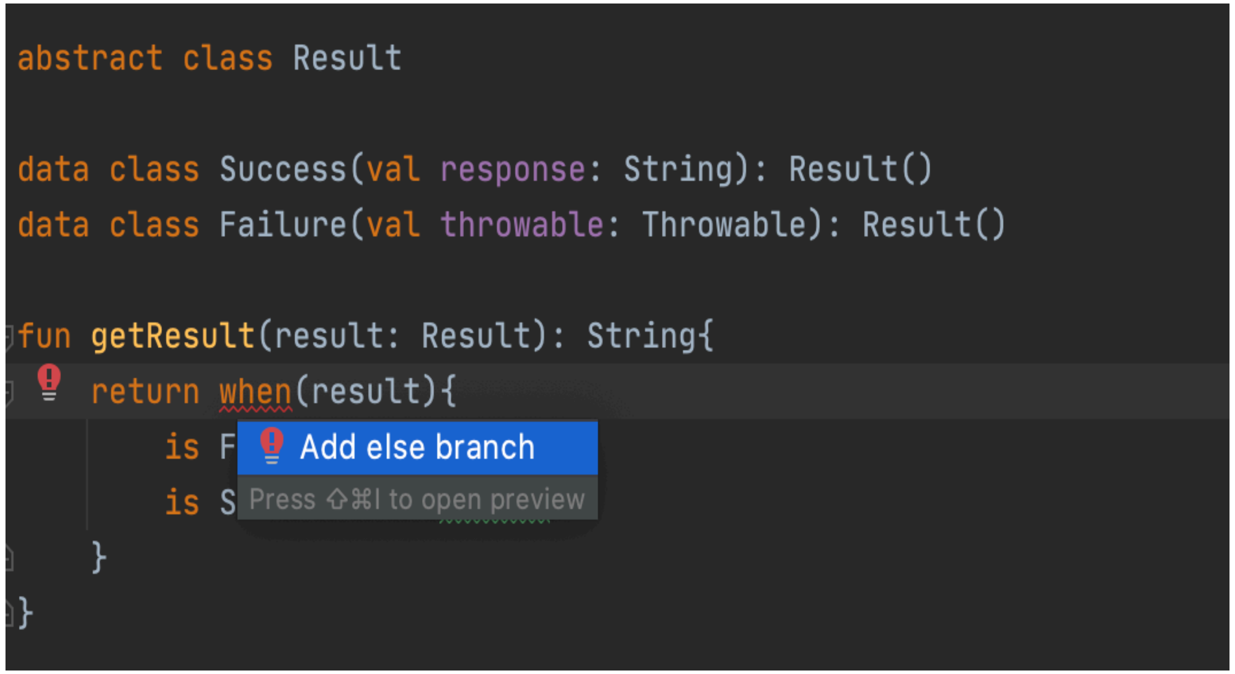
```
val customer = Customer("kotlin", "70210***64")
       .let {
          it.name = it.name.capsFirsCharacter()
          it.name
       }

println(customer)
```

```
Kotlin
```

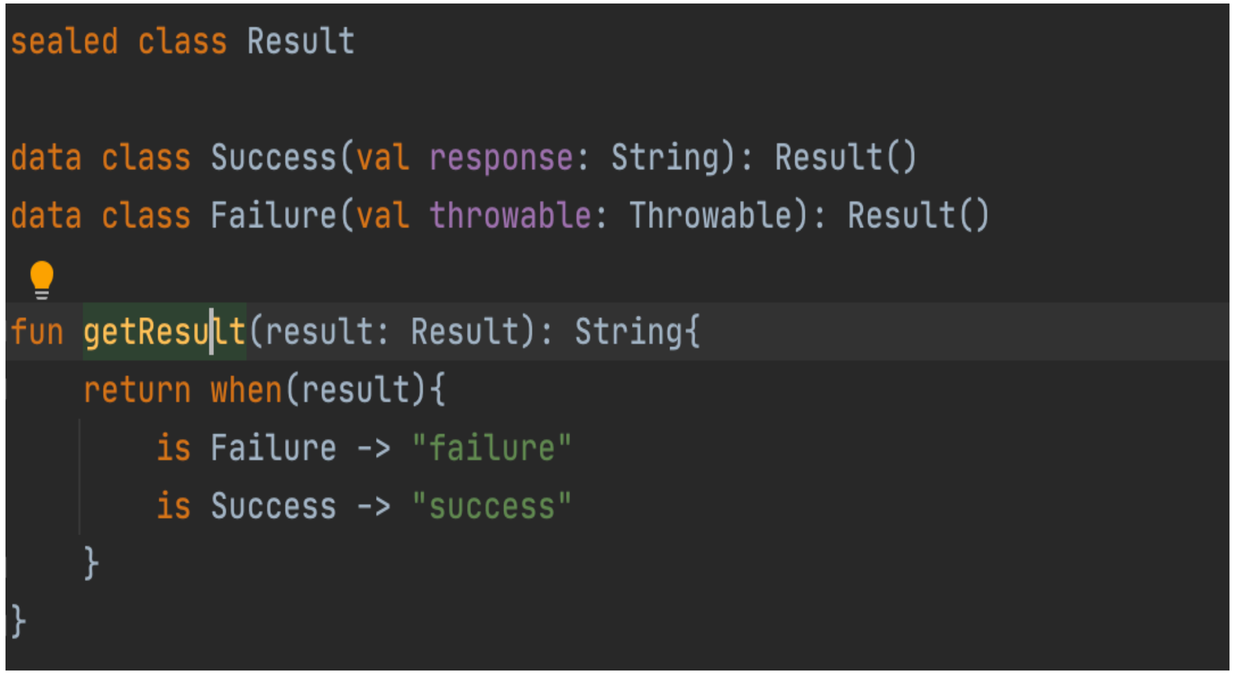
#9
Sealed Classes

- Limits class Hierarchies
- More control on inheritance of the class
- Subclasses are known at compile time
- Hierarchies in the same file

```
enum class Result(message: String) {
    SUCCESS(message = "success"),
    FAILURE(message = "failure", throwable)
}

# Not possible to add state of the FAILURE



sealed class Result {
    data class Success(val response: String) : KotlinPresentationSealed()
    class Failure(throwable: Throwable): KotlinPresentationSealed()
}

println(KotlinPresentationSealed.Success("{}"))
println(KotlinPresentationSealed.Failure(Exception("Invalid request")))


#States of result allowed
```



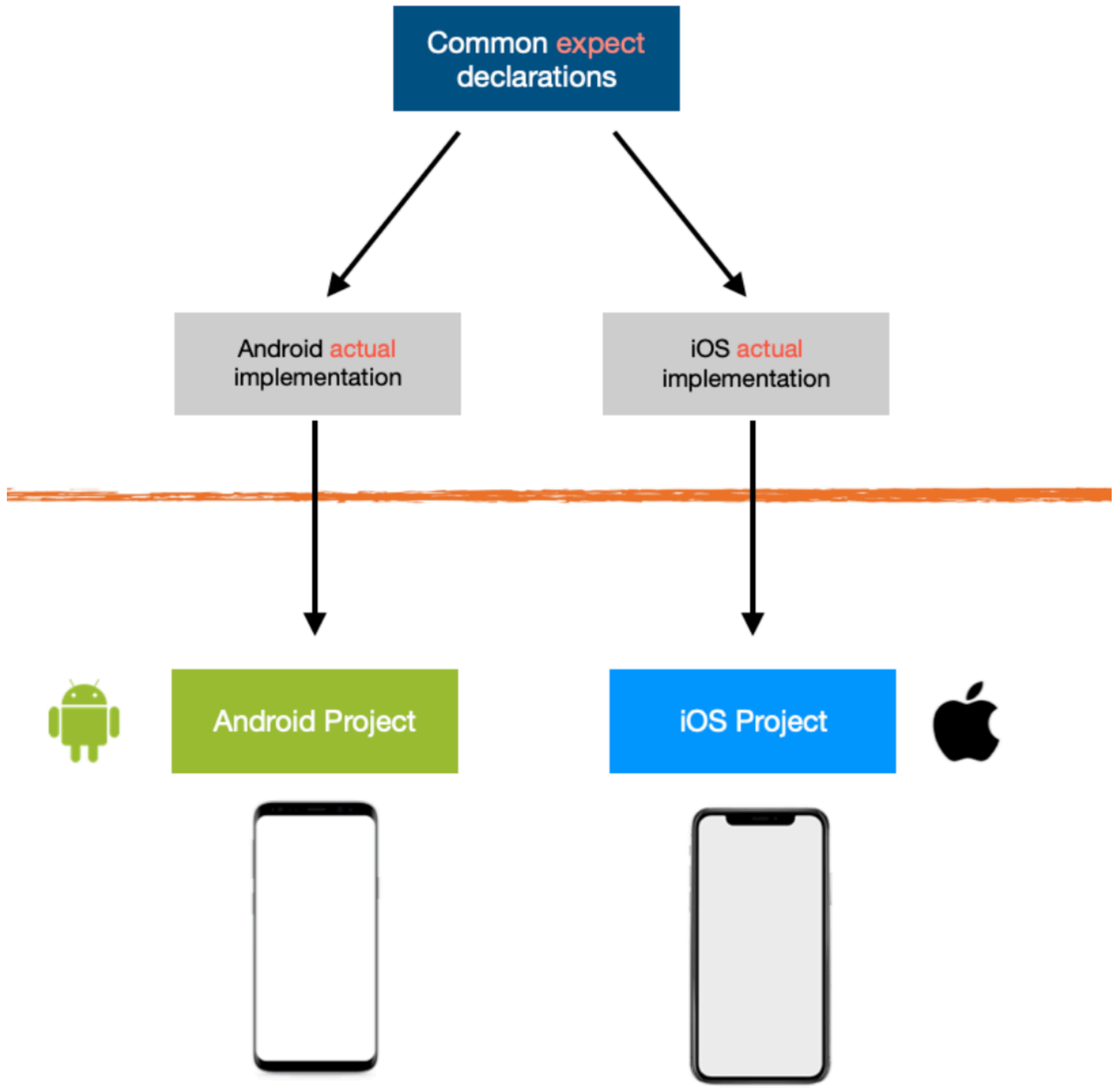
```kotlin
abstract class Result

data class Success(val response: String): Result()
data class Failure(val throwable: Throwable): Result()

fun getResult(result: Result): String{
    return when(result){
        is F
        is S
    }
}
```

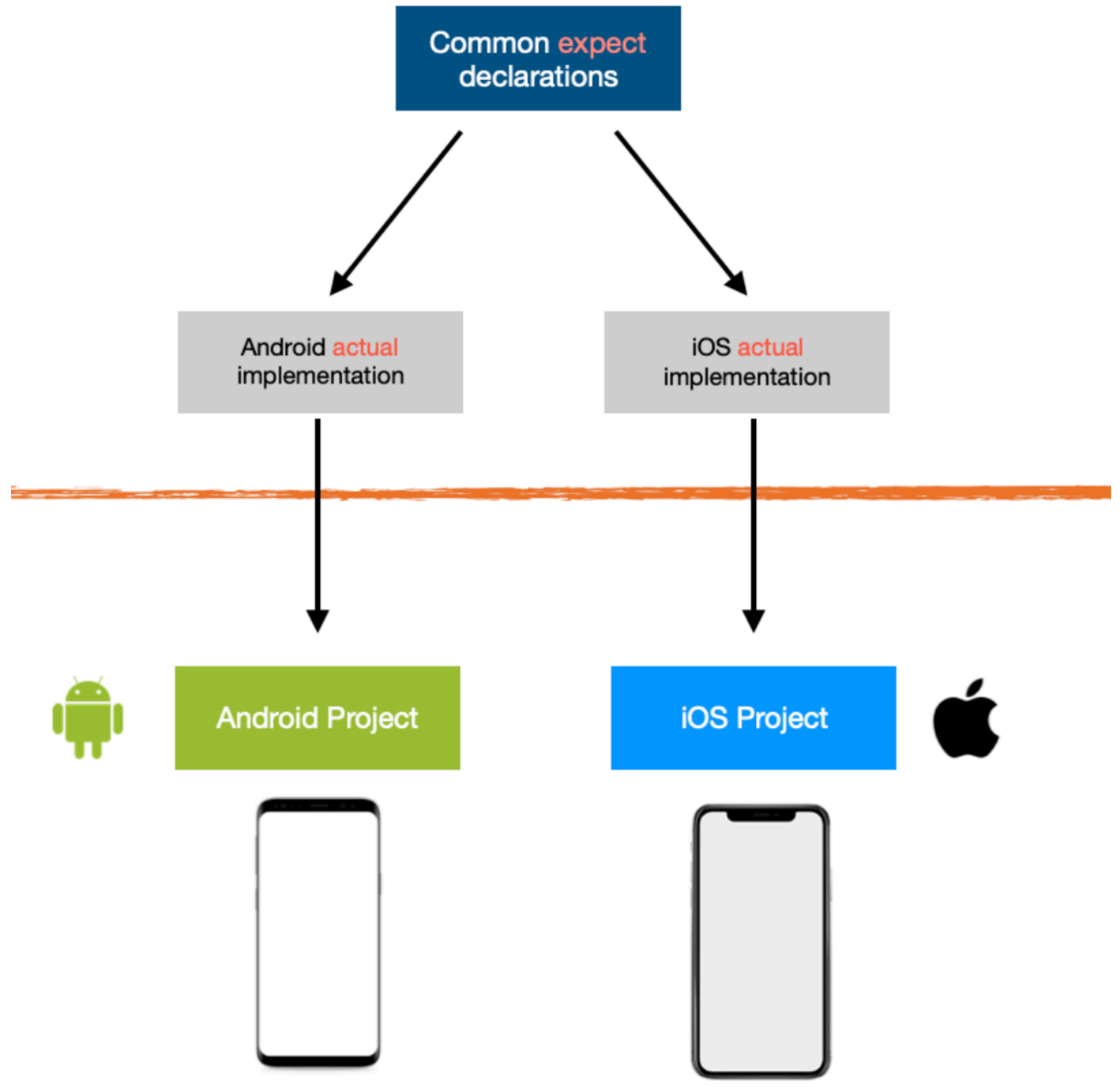


```kotlin
sealed class Result

data class Success(val response: String): Result()
data class Failure(val throwable: Throwable): Result()

fun getResult(result: Result): String{
    return when(result){
        is Failure -> "failure"
        is Success -> "success"
    }
}
```

#10
Kotlin Multi-Platform

- Share common code among platforms android, ios, web
- Task like network calls, long running coroutine task, serialization
- Single source of truth for common code


Common expect declarations
Android actual implementation
iOS actual implementation
Android Project
iOS Project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```
expect fun log(message: String)

#android

actual fun log(message: String){
    Log.d("android", message)
}


#ios
actual fun log(message: String){
    NSLog(message)
}


#jvm
actual fun log(message: String){
    println(message)
}
```

ANY QUESTIONS ?

SHOOT !!

THANK YOU