



Kotlin Multiplatform
for
Clean Architecture



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Mobile apps since ~ 2013

Android, iOS, Backend, Audio

Prerequisites: Kotlin Multiplatform



- › Android
- › iOS
- › Kotlin
- › MVVM architecture pattern
- › SQL(ite)

Recap: Kotlin Multiplatform



Kotlin language

Kotlin compiler



JVM

Kotlin native compiler



LLVM

Kotlin Multiplatform



gradle module



native library

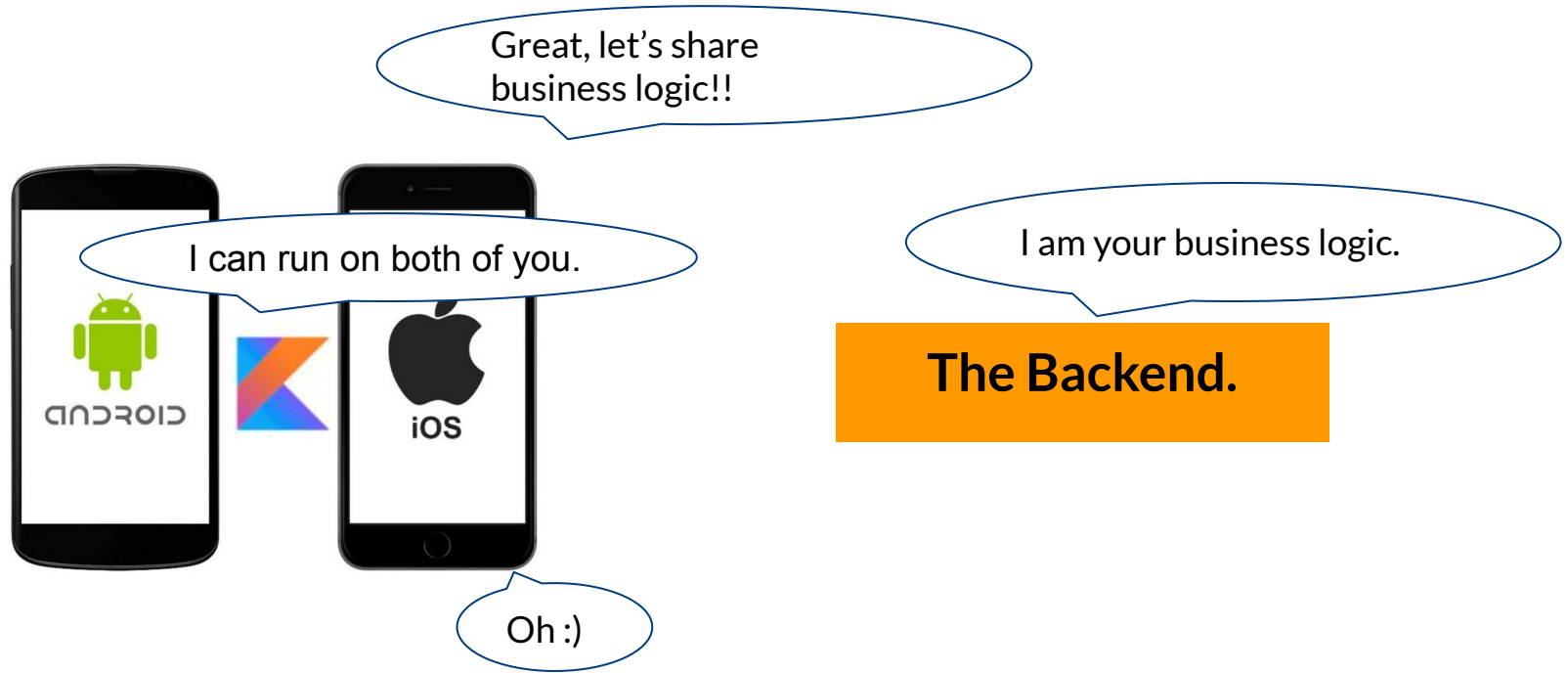


native code

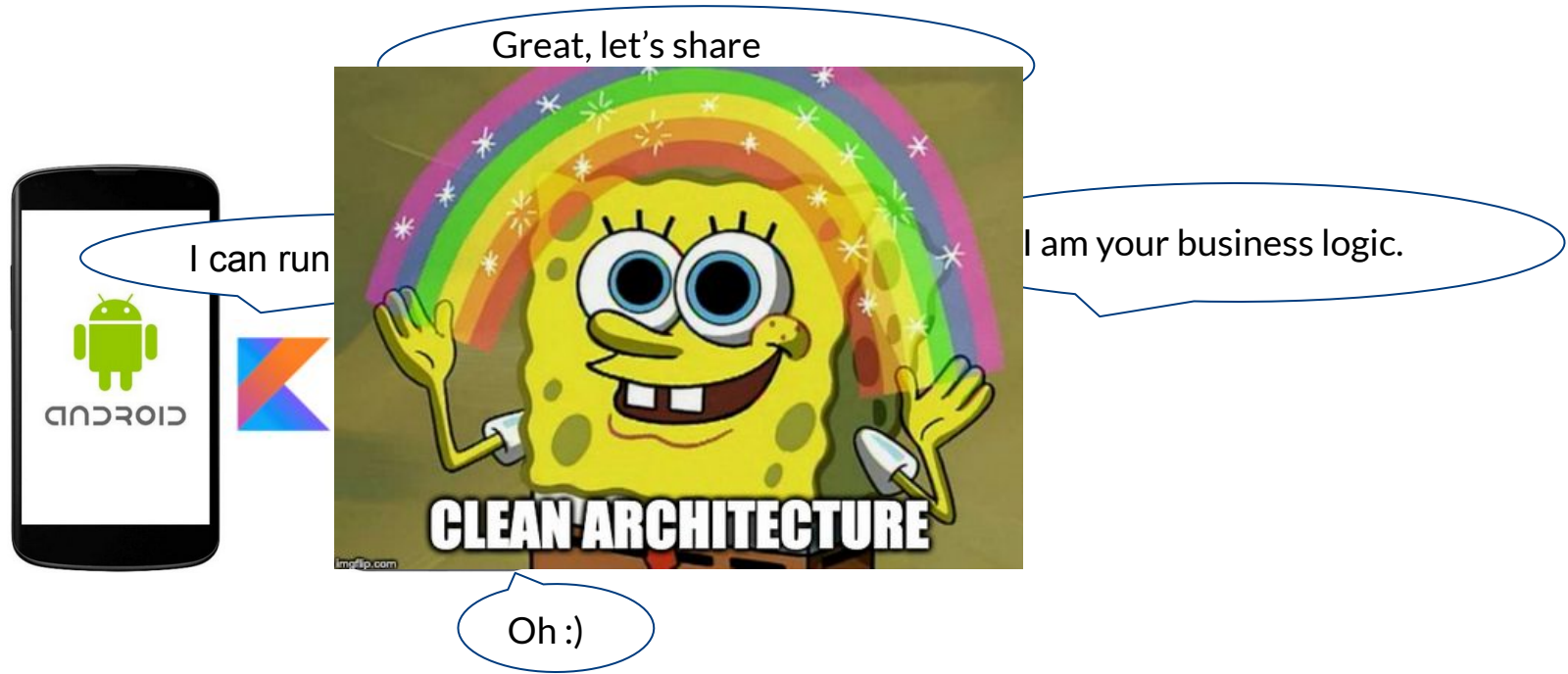
multiplatform app



Motivation

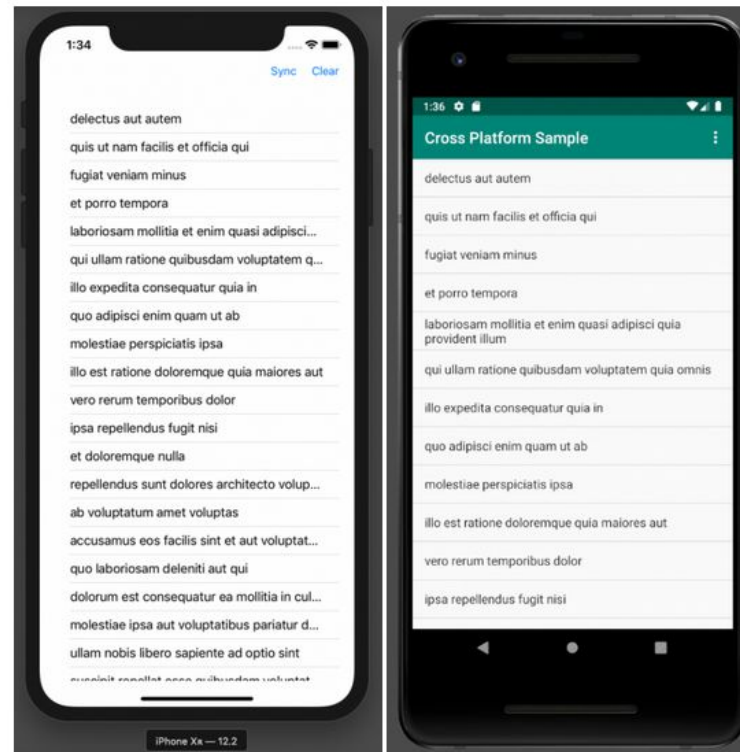


Motivation

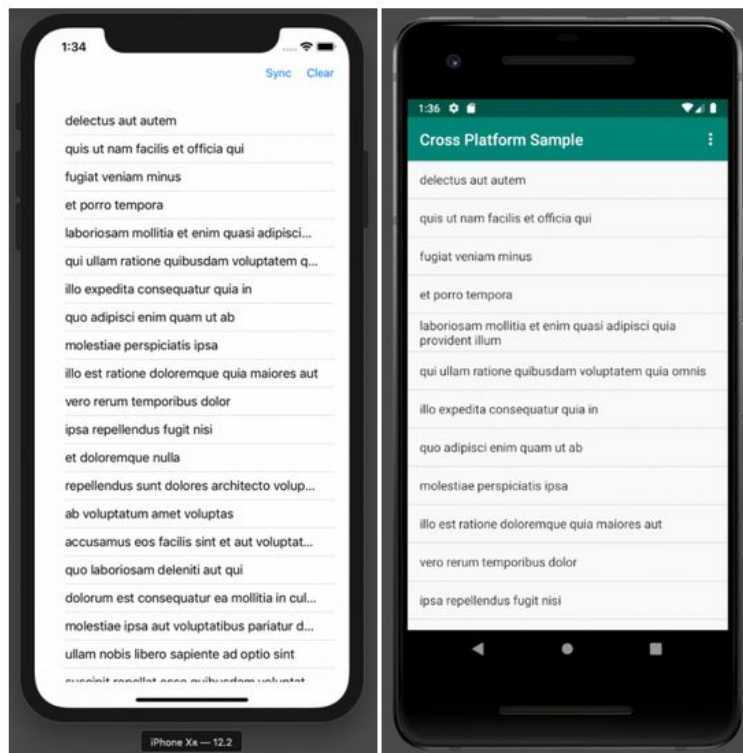


Schedule

- › MVVM example
 - › libraries
 - › persistence
 - › API client
 - › view model
 - › live demo
- › Evaluation
 - › production readiness
 - › future of KMP



Example use case



- › Todo-App (a list of strings...)
- › shared:
 - › persistence layer
 - › API client
 - › view models
- › platform-specific:
 - › UI

<https://github.com/inovex/kotlin-multiplatform-sample>

Libraries needed

- › Retrofit / OkHttp
- › Room
- › Koin
- › Live Data
- › Gson
- › Bouncycastle

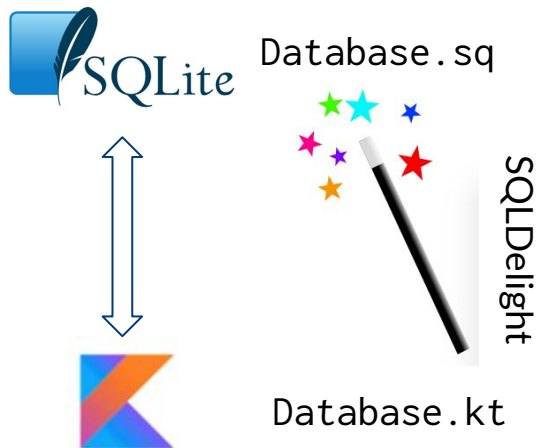
...

- › Ktor
- › SqlDelight
- › Kotlin-Serialization

and many more!

<https://github.com/AAkira/Kotlin-Multiplatform-Libraries>

SQLDelight



- › model classes
 - › queries
 - › change listeners
- shared
- › sql driver

SQLDelight

```
CREATE TABLE todo(  
  id INTEGER PRIMARY KEY AUTOINCREMENT,  
  title TEXT NOT NULL,  
  completed INTEGER  
);
```

```
selectAll:  
SELECT *  
FROM todo;
```

```
insert:  
INSERT INTO todo(title, completed)  
VALUES (?, ?);
```

```
deleteAll:  
DELETE FROM todo;
```



```
fun addTodo(title: String, completed: Boolean) {  
  val completedNum = if (completed) 1L else 0L  
  database.databaseQueries.insert(title, completedNum)  
}
```

```
val listener = object : Query.Listener {  
  override fun queryResultsChanged() {  
    onChangeCallback(database.databaseQueries.selectAll().executeAsList())  
  }  
}  
  
database.databaseQueries.selectAll().addListener(listener)
```

API client

Ktor

+ Kotlin-serialization

+ Coroutines

API client

shared

API client



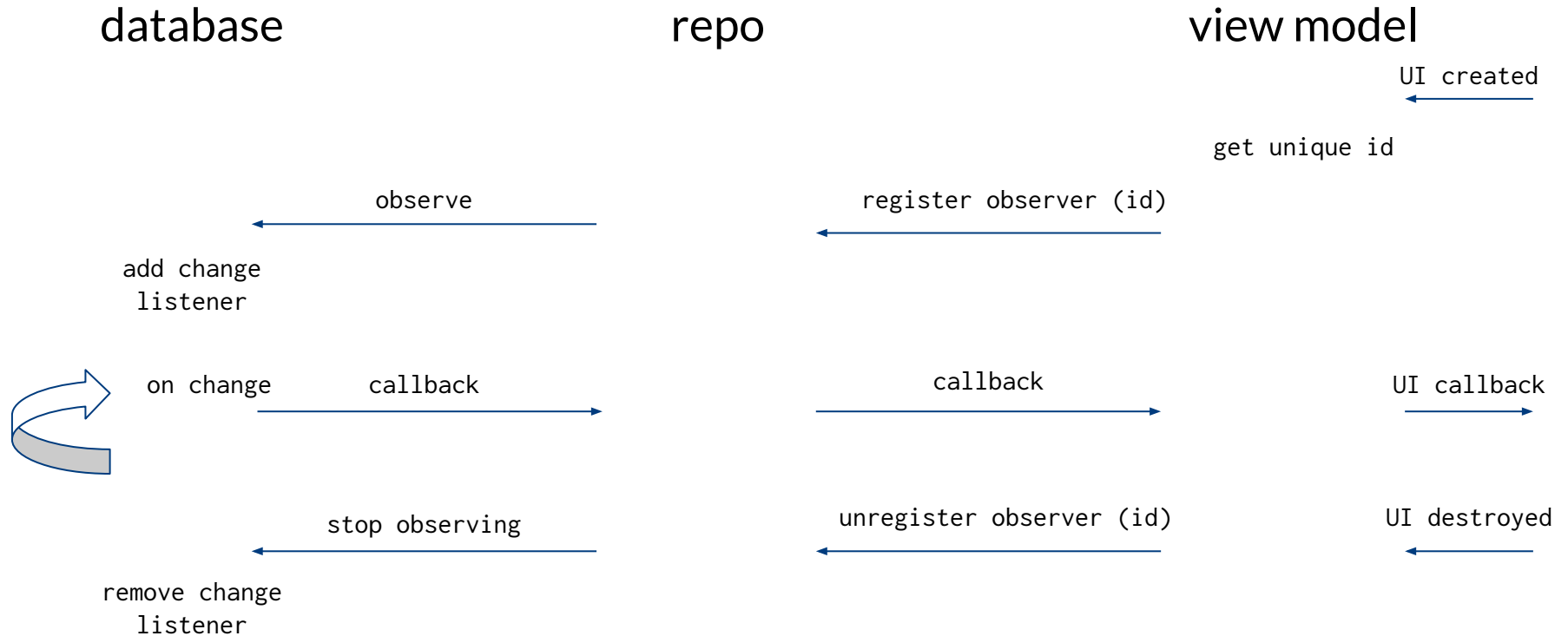
```
internal class Api(private val repo: TodoRepository) {
    private val client = HttpClient()

    val baseUrl = "https://jsonplaceholder.typicode.com/"

    @Serializable
    data class ApiTodo(val title: String, val completed: Boolean)

    fun getTodos(): Job {
        val url = baseUrl + "todos/"
        return GlobalScope.launch(applicationDispatcher) {
            val result = client.call {
                url(url)
            }.response.readText()
            val apiTodos = Json.nonstrict.parse(ApiTodo.serializer().list, result)
            CommonDatabase.database.transaction {
                apiTodos.forEach {
                    repo.addToDo(it.title, it.completed)
                }
            }
        }
    }
}
```

Repository & view model



View model usage



```
viewModel.observeTodos { todos ->
    if (adapter == null) {
        adapter = ArrayAdapter<String>(this, android.R.layout.simple_list_item_1, todos.map { it.title })
        todoList.adapter = adapter
    } else {
        adapter!!.apply {
            clear()
            todos.forEach { insert(it.title, count) }
            notifyDataSetChanged()
        }
    }
    Toast.makeText(this, "Updated TODO list", Toast.LENGTH_SHORT).show()
}
```



```
viewModel.observeTodos(onChangeCallback: { (list: [Todo]) -> KotlinUnit in
    self.todos = list.map { (t) -> String in return t.title }
    self.tableView.reloadData()
    return KotlinUnit()
})
```

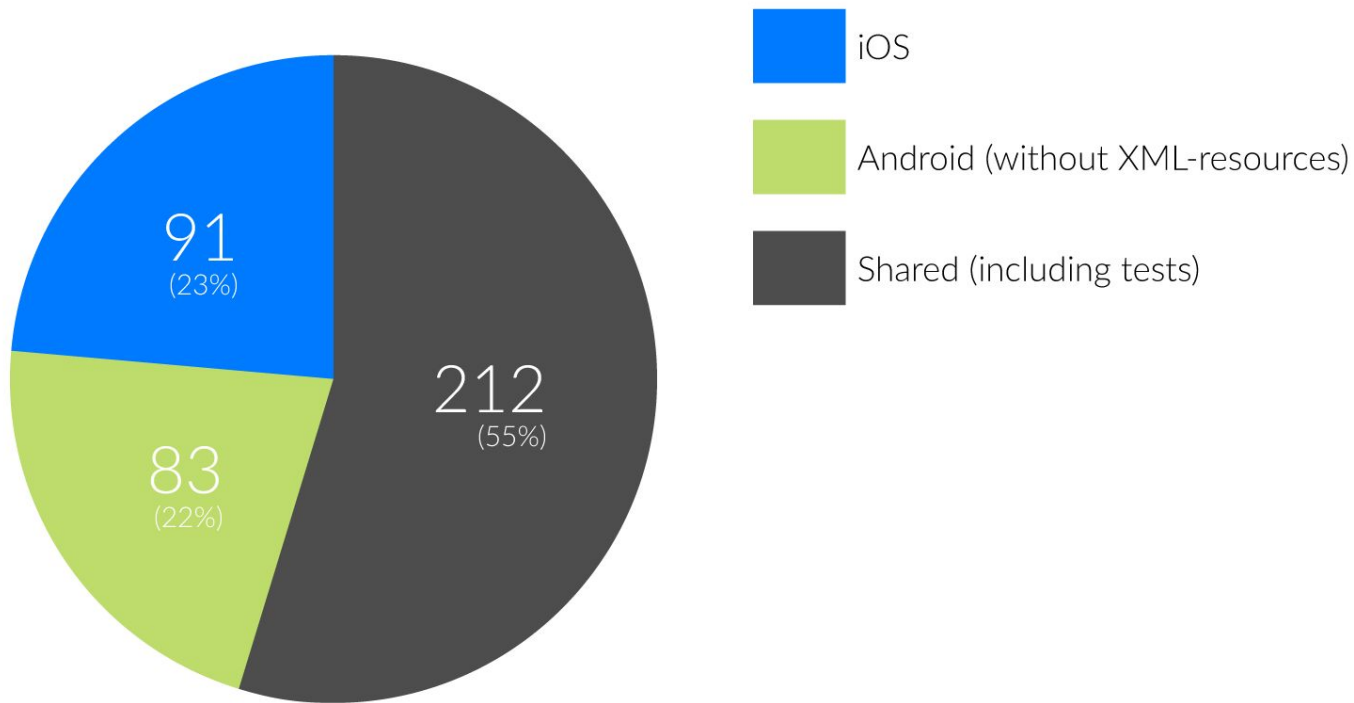
Unit tests

JVM + JUnit

(for now)



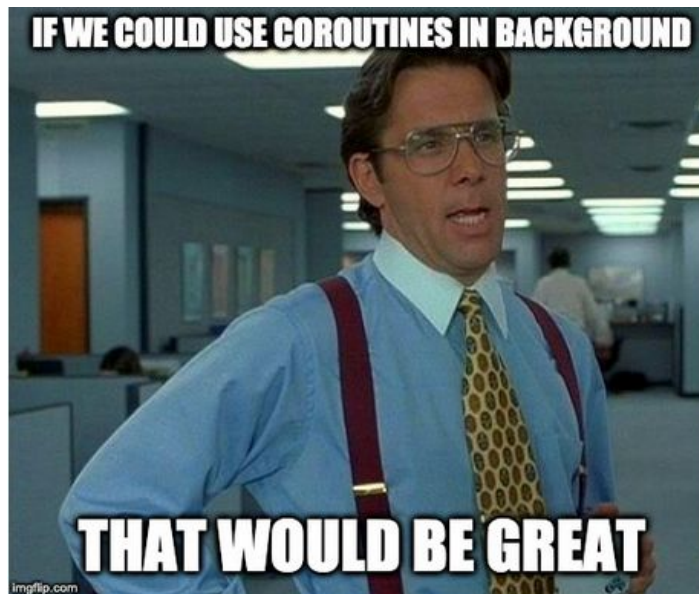
Evaluation



LOC (including blanks)

Production ready?

- ✓ Development pace
- ✓ App performance
- ✓ Stack traces
- ✓ CI / CD
- 🙄 IDE support
- 🙄 Coroutines support



<https://github.com/Kotlin/kotlinx.coroutines/issues/462>

Build times



https://www.reddit.com/r/ProgrammerHumor/comments/ac49qr/android_studio_radiator/

Future

- › Google / JetBrains promised improved IDE support for KMP
- › JetBrains should fix Coroutines on native
- › likely to become No. 1. framework - adopt early!

Resources

<https://github.com/inovex/kotlin-multiplatform-sample>

<https://www.inovex.de/blog/kotlin-multiplatform-for-clean-architecture/>

<https://kotlinlang.org/docs/reference/building-mpp-with-gradle.html>

<https://touchlab.co/kotlin-native-stranger-threads-ep-1/>

<https://touchlab.co/kotlin-native-stranger-threads-ep-2/>

<https://github.com/AAkira/Kotlin-Multiplatform-Libraries>

Thank you!

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