

Testing Kotlin Coroutines

I need a time machine





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Dev



Outline

- Android and coroutines
 - Problems
 - What I want
 - Fix
- Demo
 - Hello 8 Ball
 - Slow vs Fast
 - Flakey vs Predictable
 - ViewModel tests
 - API tests

What next?



Android and Coroutines





Problems



Well,

Code does not run on Main thread

Lifecycle aware components check for
Main/UI thread



Tests finish before the code runs



// don't change ... the test might fail `~_(\ツ)_/-`

delay(3000)



pass/fail locally

fail/pass on CI

BUILD FAIL



✓ MyViewModelTest

- ✓ asking a question returns an answer
- ✓ asking a question sets is loading
- ✓ loading is false in the beginning
- ✓ return an answer stops loading
- ✓ 🚀 asking a real question returns an answer

Test Summary

39

tests

1

failures

10

ignored

0.594s

duration

96%

successful

Failed tests

Ignored tests

Packages

Classes

MyViewModelTest. asking a question sets is loading



@Ignore("This test takes too long")

@Ignore("This test sometimes fails")



What I want



Fast
Predictable
CI



Fix



Fix - a time machine

- Run everything on one thread
 - `runBlocking -> runBlockingTest`¹
 - Swap out UI/Main thread¹
 - Inject
- Control the dispatchers¹
- Architecture
- JVM

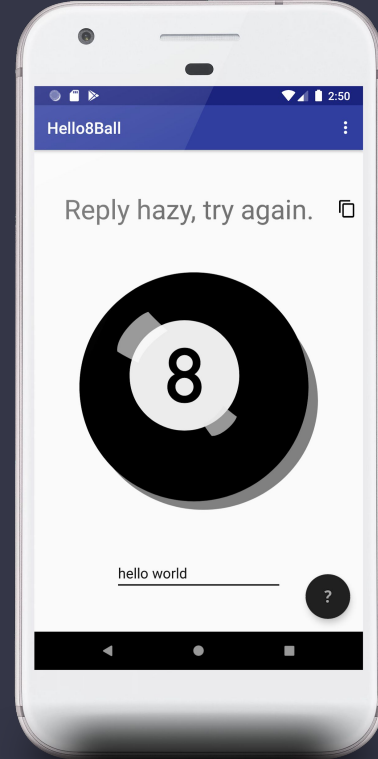
¹: experimental `kotlinx-coroutines-test`

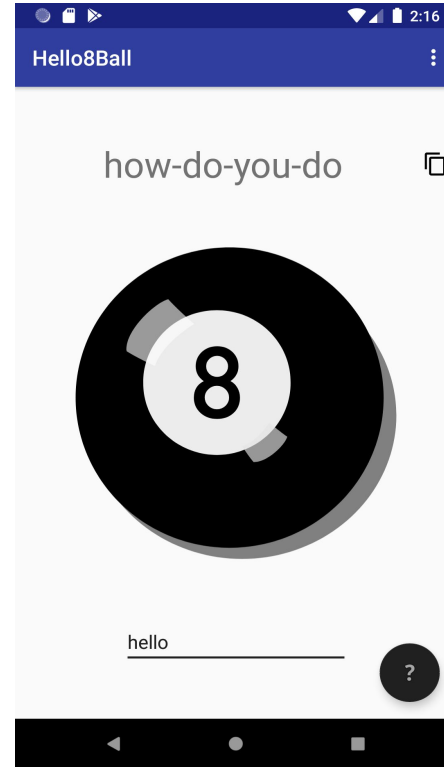
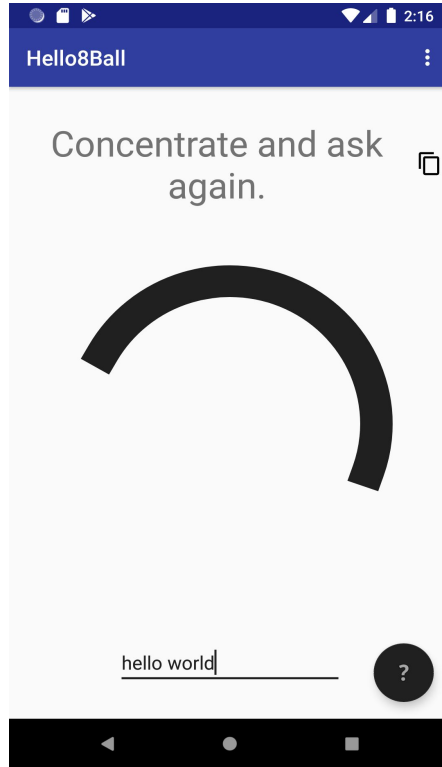


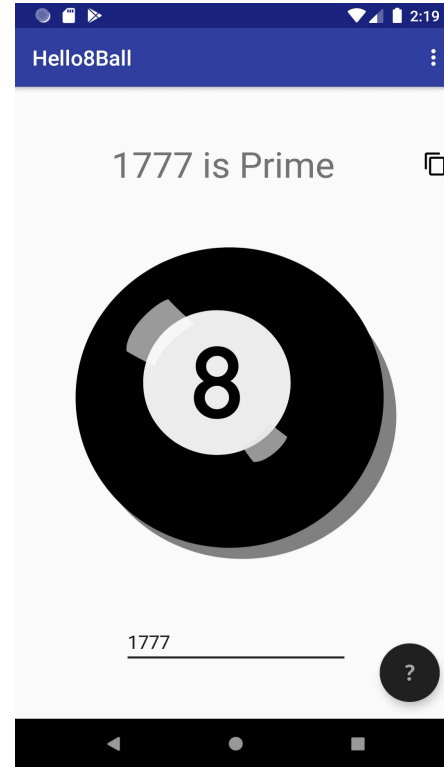
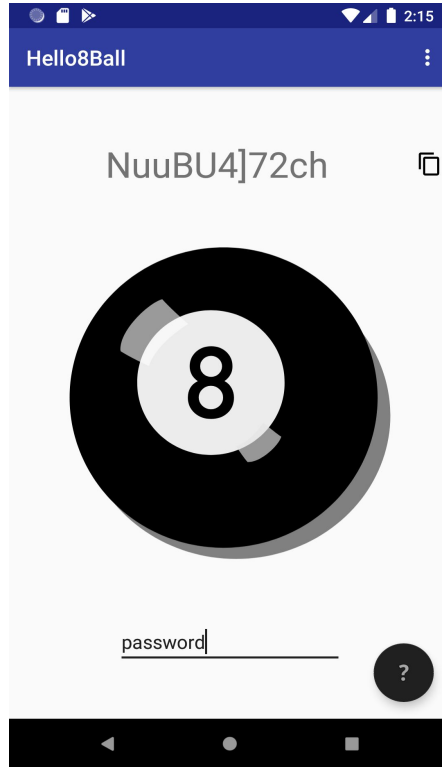
Demo



Hello 8 Ball







Slow vs Fast



Flakey vs Predictable



ViewModel tests



Api tests



✓ SlowFastTests (net.maiatoday.hello8ball)	5 s 333 ms
✓ 💀 asking a real question returns an answer (delay)	3 s 36 ms
✓ 💀 should return answer from fake network (delay)	1 s 126 ms
✓ 💀 should return valid answer (delay)	1 s 45 ms
✓ 🚀 asking a real question returns an answer (no delay)	4 ms
✓ 🚀 should return answer from fake network (no delay)	4 ms
✓ 🚀 should return valid answer (no delay)	118 ms

Slow vs Fast



What Next?



What next?

1. Add one test and make it run on CI
2. Inject the dispatchers and/or add the kotlin testing library
3. Add a few coroutine tests
4. Migrate architecture to separate Android/coroutine code/other code



References



[Library: Kotlinx coroutines test](#)



[Video: Coroutines +Testing = <3](#)



[Video: Writing awesome tests](#)



[Book: Learning Concurrency in Kotlin](#)



[Repo: Codelab Kotlin Coroutines](#)



Code - Slides - Bonus



<https://github.com/maiatoday/Hello8Ball>

Slides

Bonus : lint, detekt, coverage, circle ci

