Coroutines - Teaser



BNE Kotlin User Group

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Agenda

- Definition what is a coroutine?
- Problems coroutines aim to solve
- How to get set up
- The basics
- How they work

What's not covered

- <u>Coroutine libraries</u> (apart from kotlinx.coroutines)
 - o Reactive Streams, RxJava, etc.
 - o Callback/future libraries: JDK8 CompletableFuture, Guava ListenableFuture, etc
- More advanced usage
 - We're just covering the basics

Sounds like a good future meetup topic!!



What is a coroutine?

"A coroutine can be thought of as an instance of suspendable computation, i.e. the one that can suspend at some points and later resume execution possibly on another thread"

- Coroutines Spec

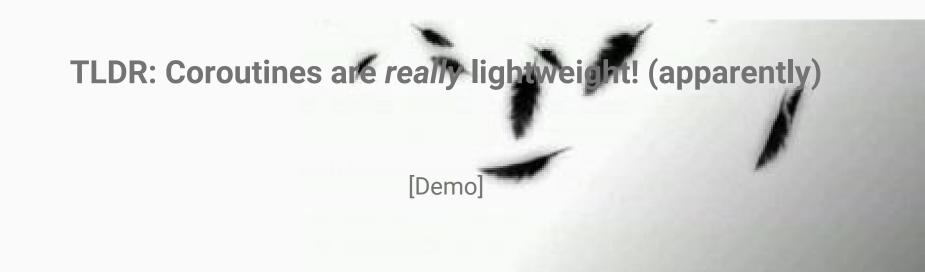
"threads are sometimes called lightweight processes"

- Oracle Java Tutorials

"coroutines are light-weight threads"

- Kotlin Coroutines Guide

What is a coroutine?



Process vs Thread vs Coroutine (Theory time!)

Process

- Own memory space (OS feature)
- Example: JVM runs as a single process

Thread

- Share resources within a process (OS feature)
- Example: Java app may utilise many threads

Coroutine

- Suspendable functions (Language i.e. Kotlin feature)
- Can run on any thread (and jump between them)

Problems coroutines try to solve

- When you can't afford threads
- Async code and callback hell (take it away Roman!)
 - o https://vimeo.com/221264980 (8:21-15:52)
- Generators (yield)
 - o [Demo]

How to start using coroutines

- Project <u>setup</u>
 - Standard Kotlin setup
 - Add kotlinx-coroutines-core library
 - Disable experimental warning
 - Bonus points for using <u>Gradle Kotlin DSL</u>:)
- Take a test drive with Coroutines by Example
 - https://github.com/Kotlin/kotlinx.coroutines/blob/master/coroutines-guide.md
 - Let's go through the very basics together!

How do coroutines work?

- Continuation passing style + state machine + Magic!
 - https://vimeo.com/221264980 (15:58-19:48)
- Read spec for more details
 - https://github.com/Kotlin/kotlin-coroutines/blob/master/kotlin-coroutines-informal.md#i mplementation-details

How do I find out more???

- Reading
 - Informal specification
- Watching
 - Introduction to Kotlin coroutines Roman Elizarov 2017
- Doing!
 - Kotlin coroutines tutorial
 - Coroutines by example guide

Questions?

