Introducing

Concurrency

Introduction

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Concurrency is HARD

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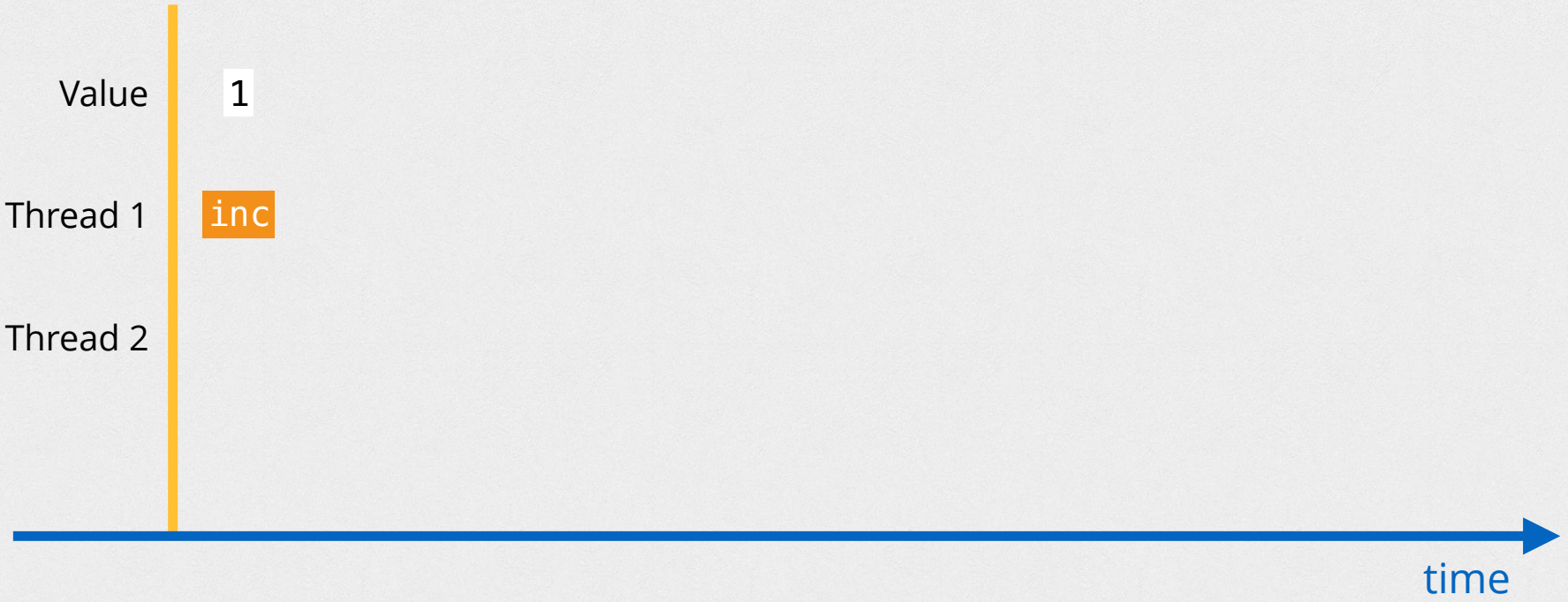
What is Concurrency?

- Multiple tasks taking place simultaneously
- Utilises multi-core CPUs
- Can make apps much more responsive
- Traditionally uses a threading model

Issues with multi-threading

- Easy to get wrong
- Difficult to debug
- Specific scenarios
  - Race condition
  - Priority inversion
  - Deadlock

Race Condition



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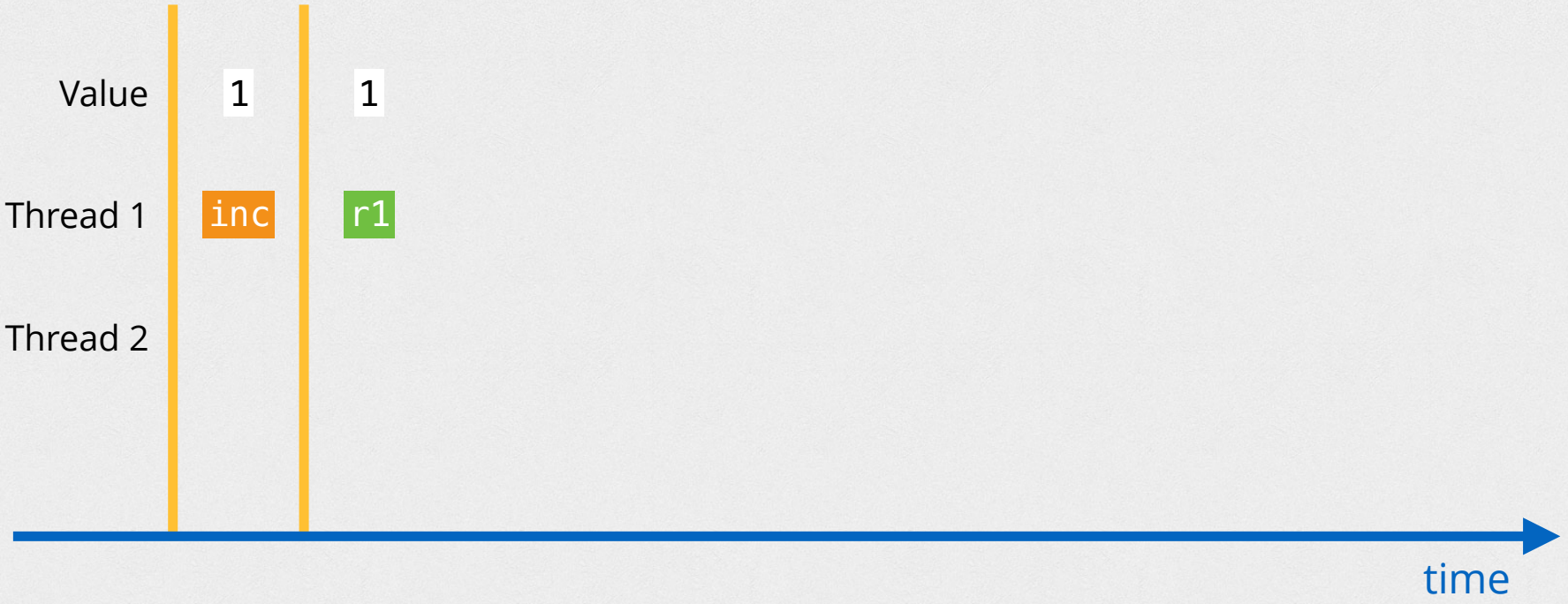

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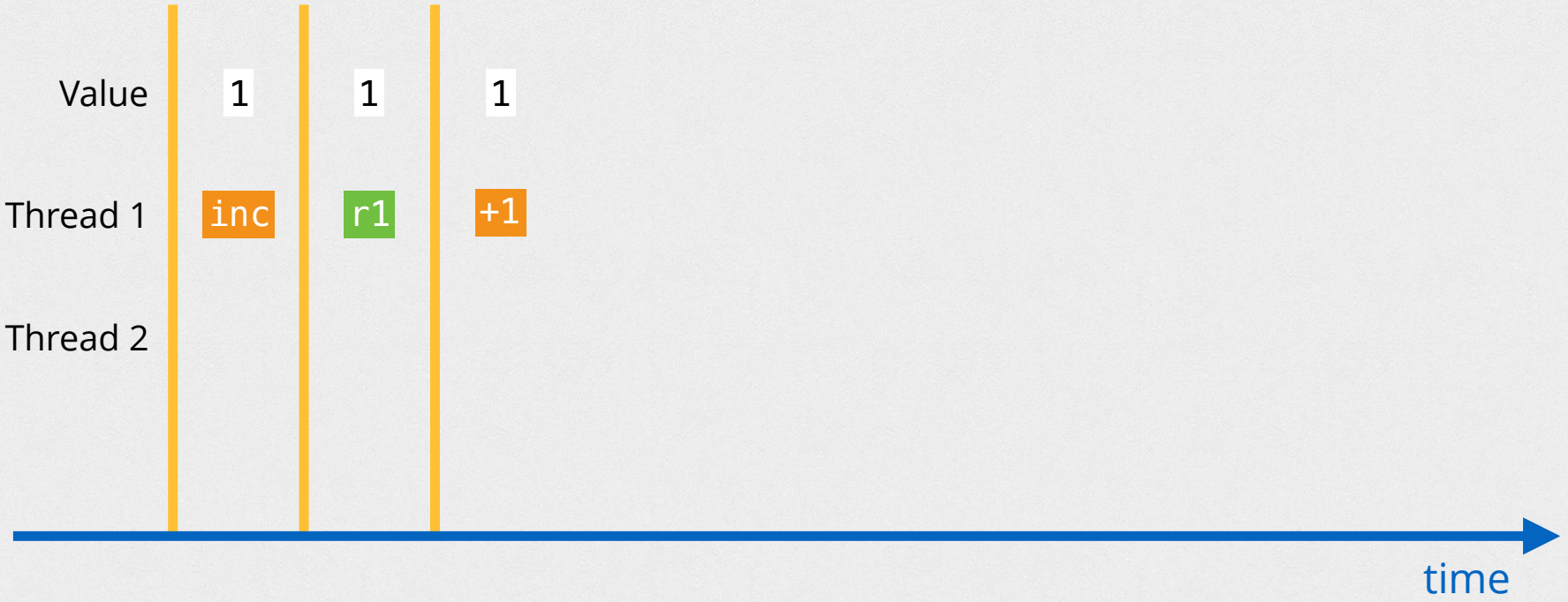

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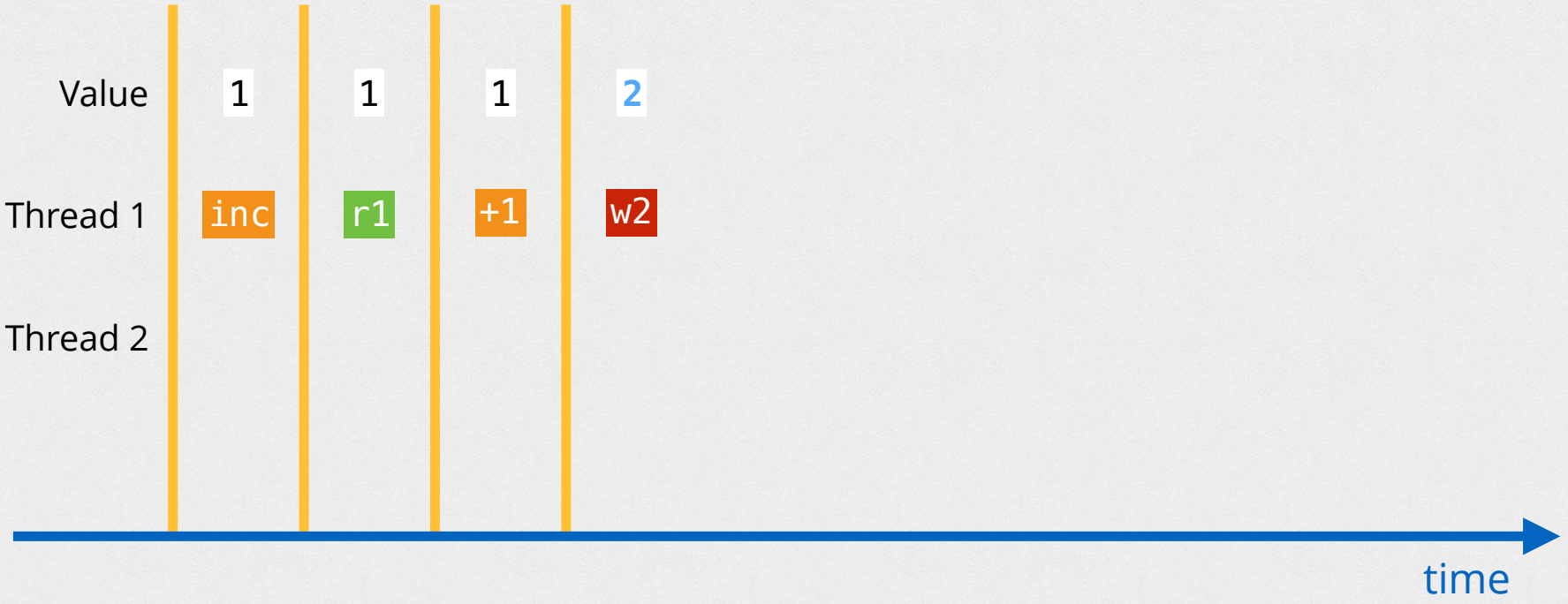

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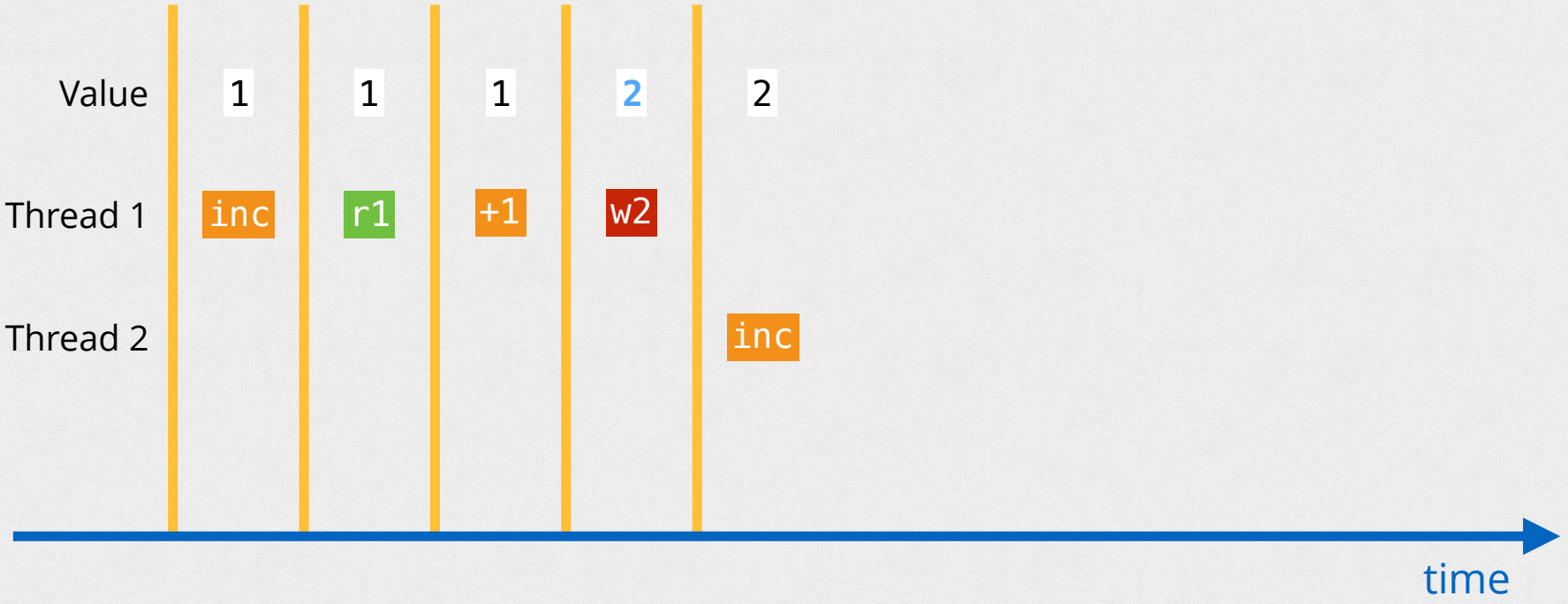

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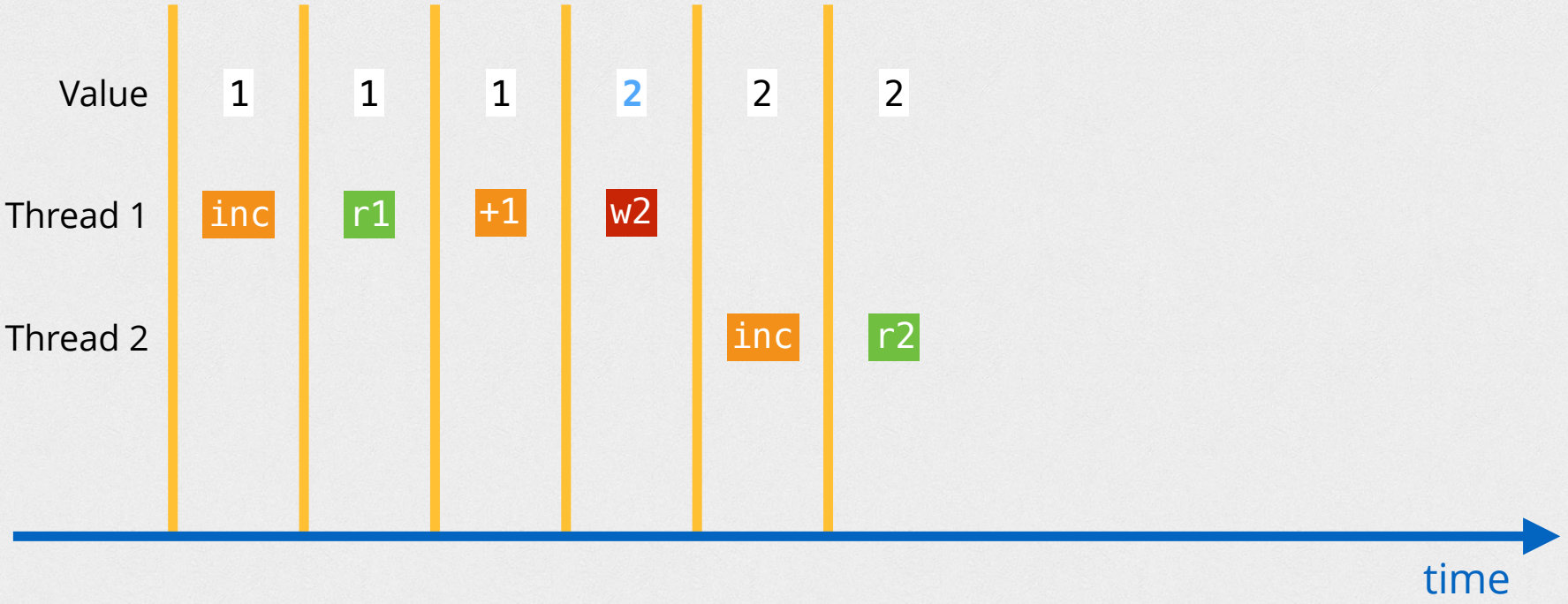

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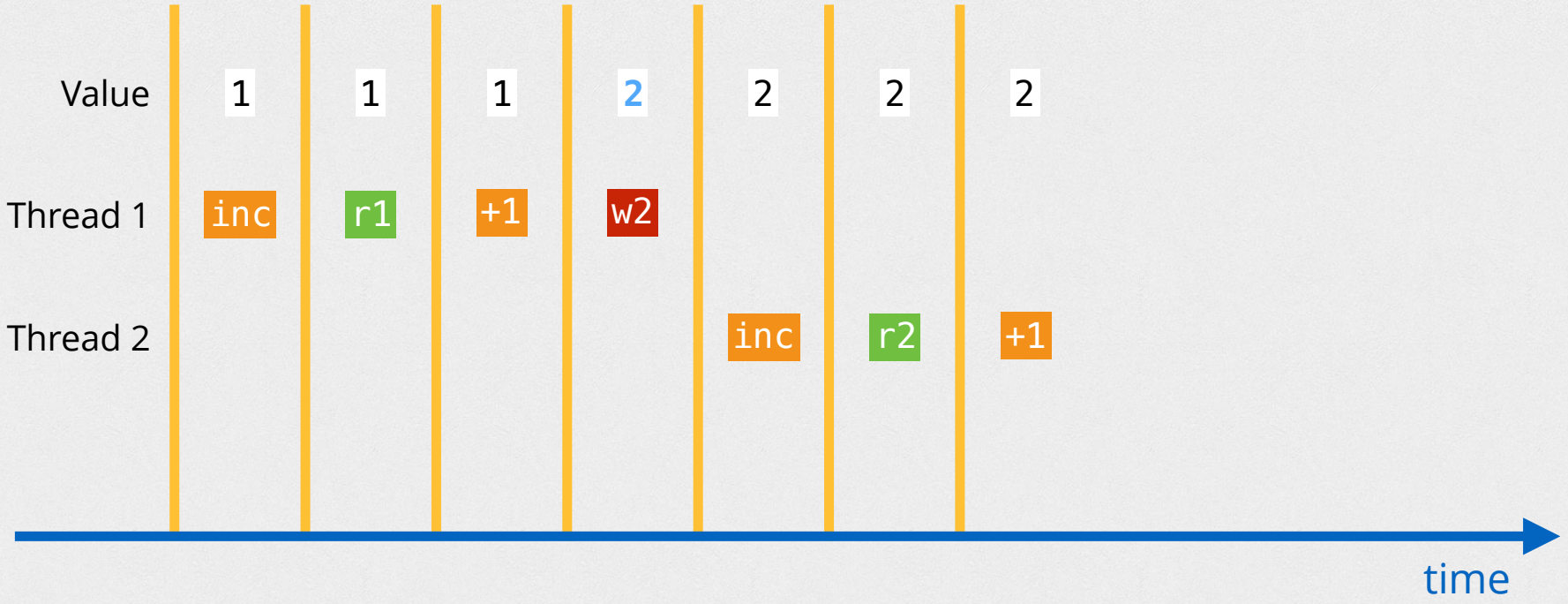

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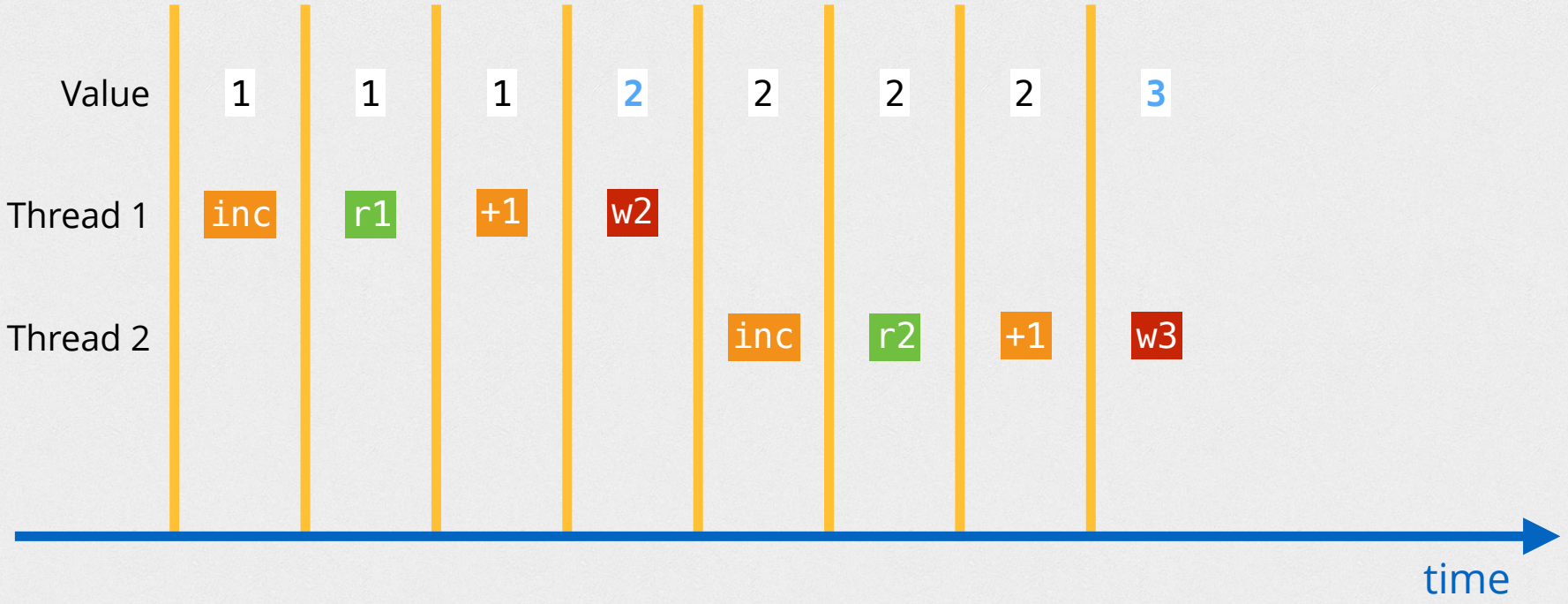

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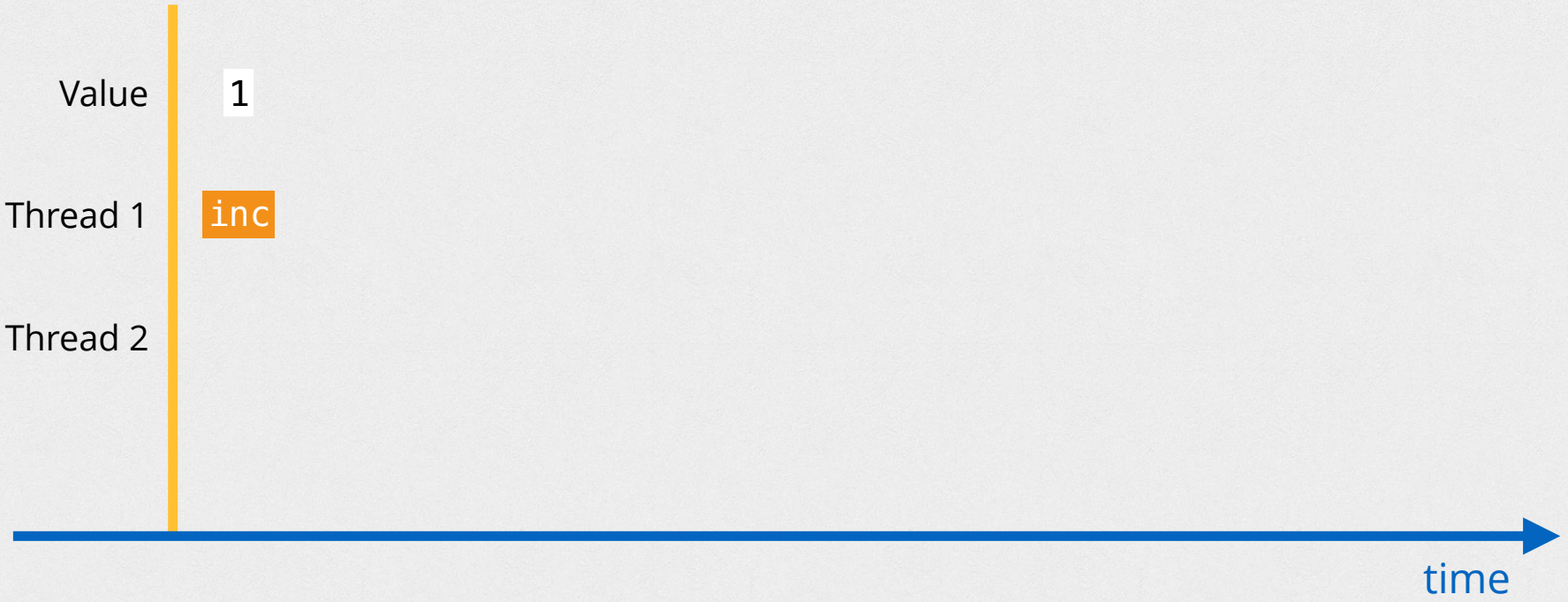

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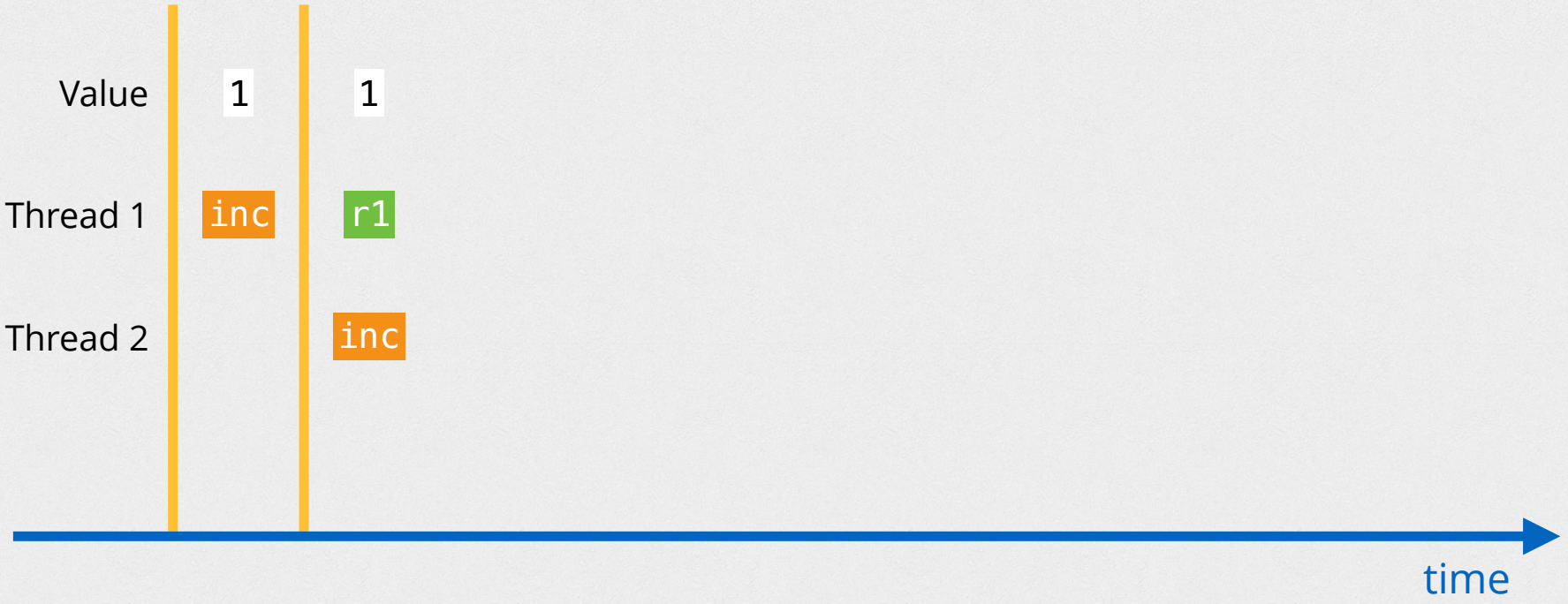

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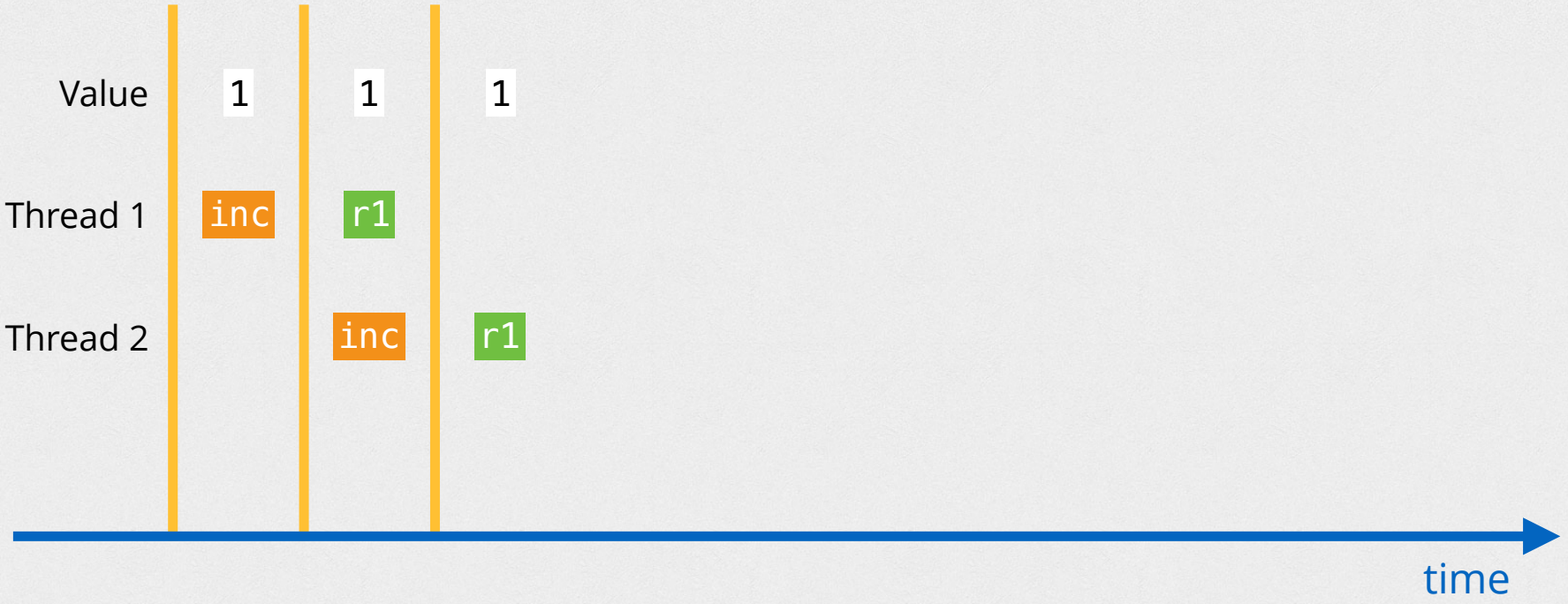

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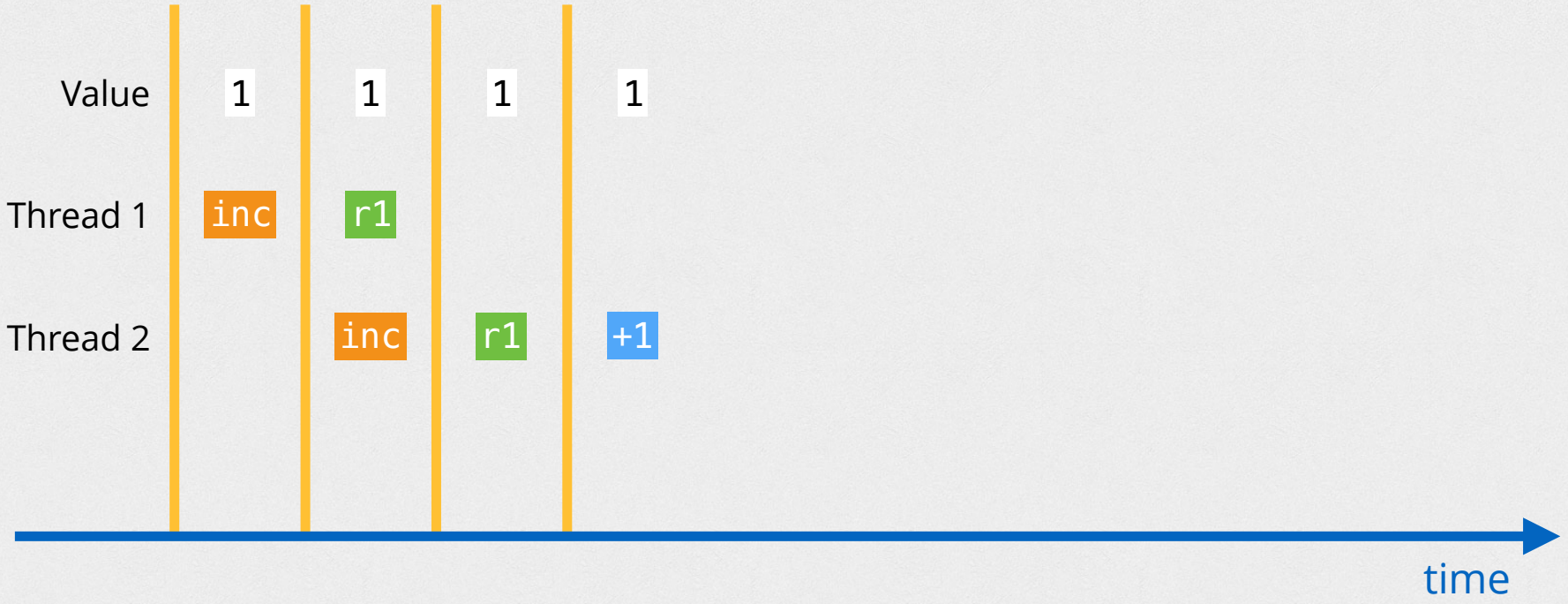

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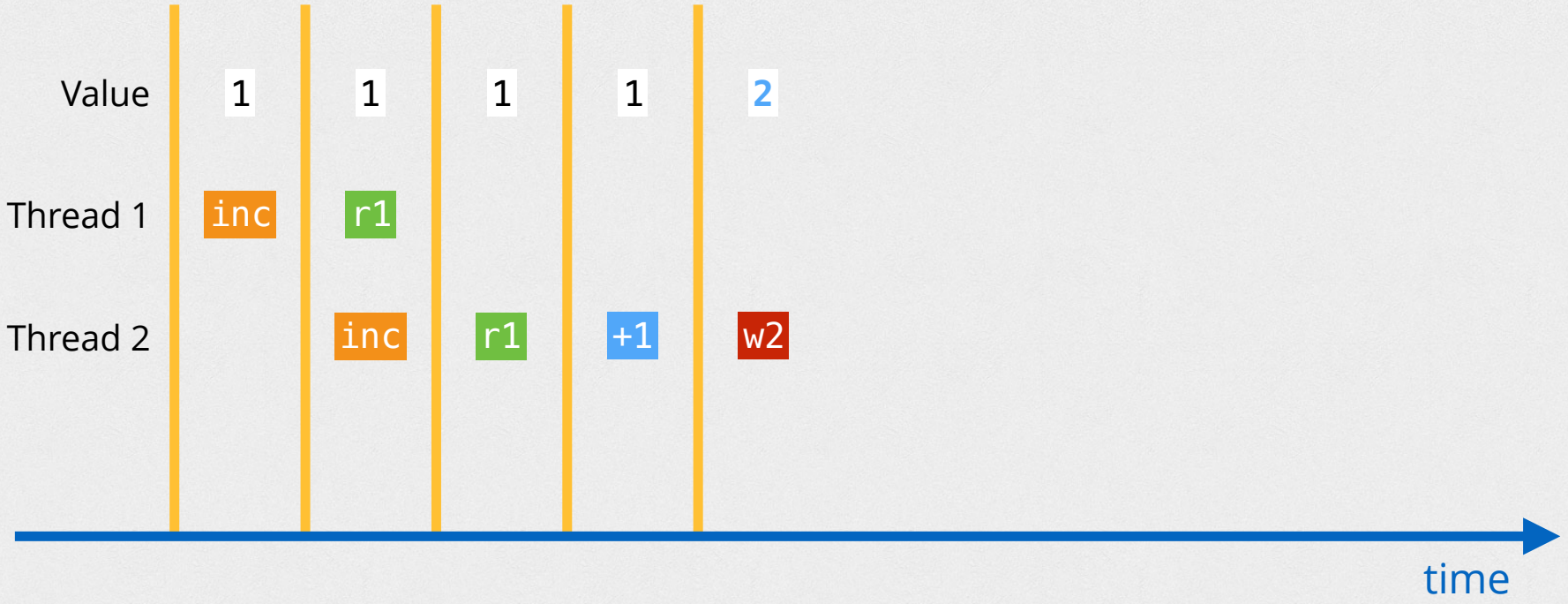

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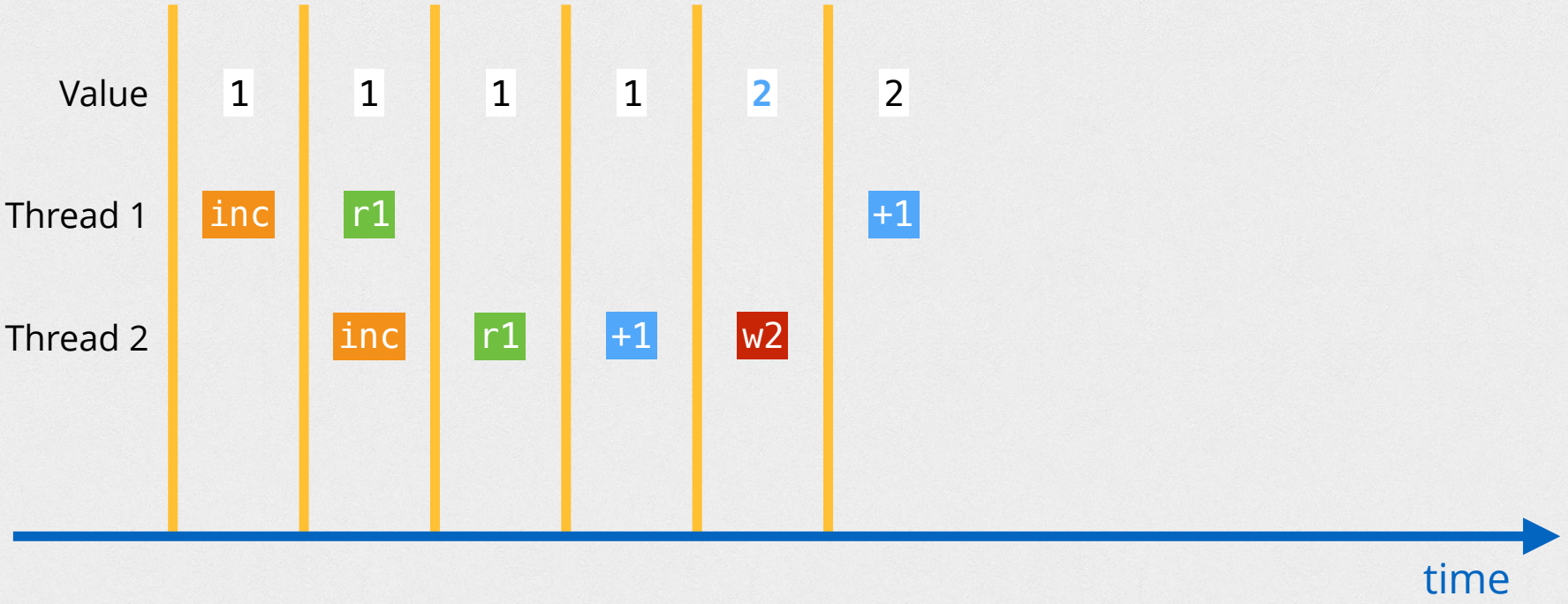

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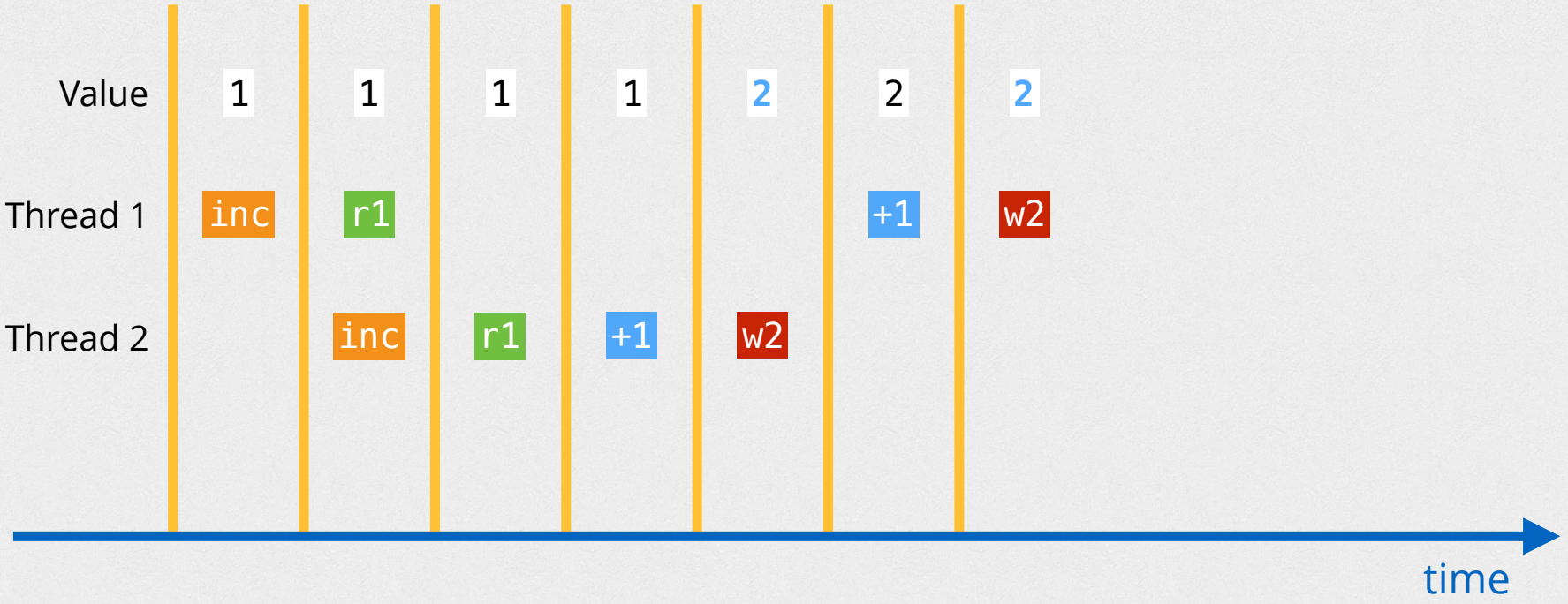
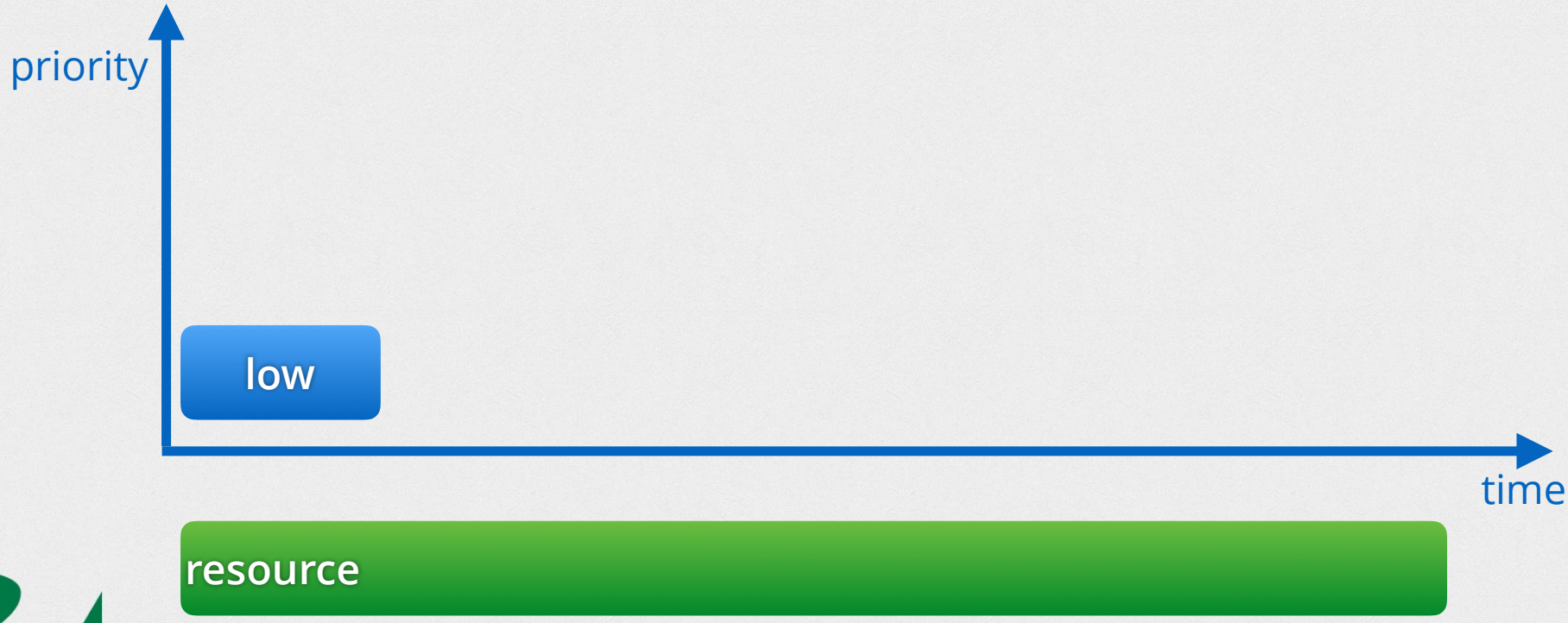


Priority Inversion



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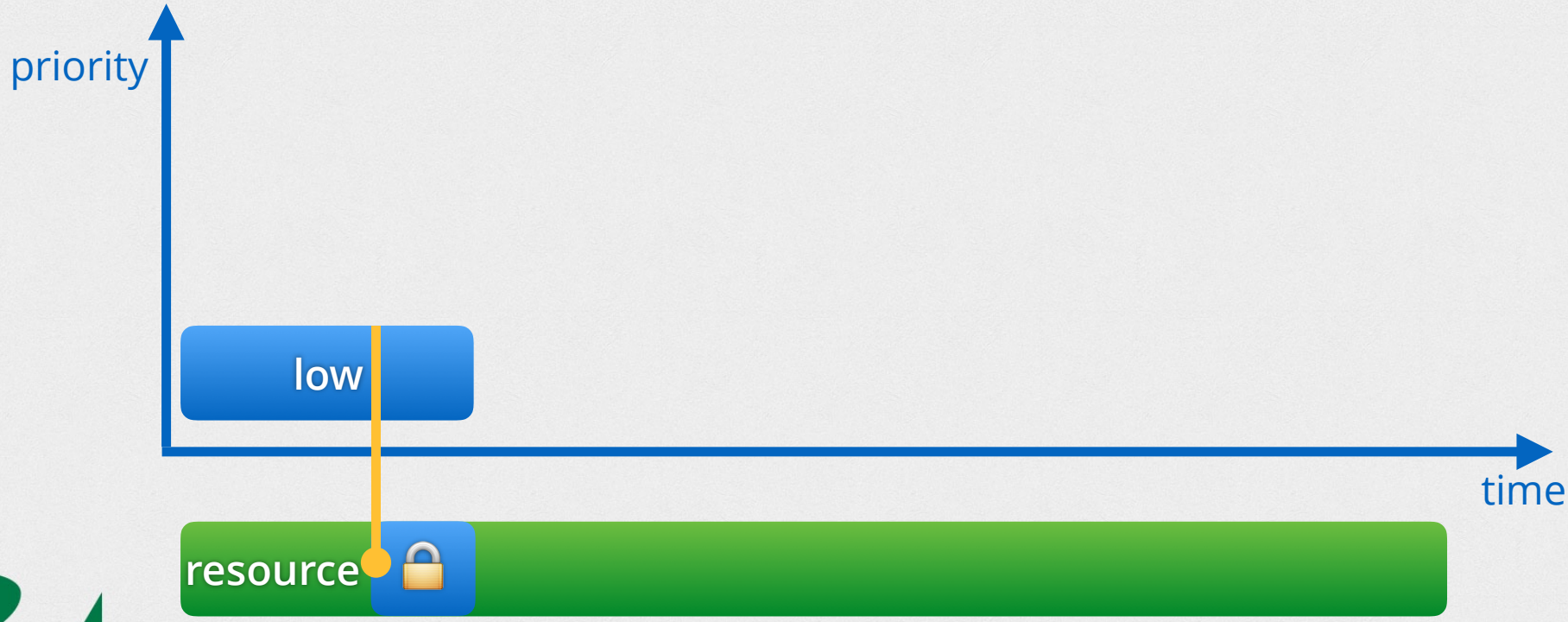

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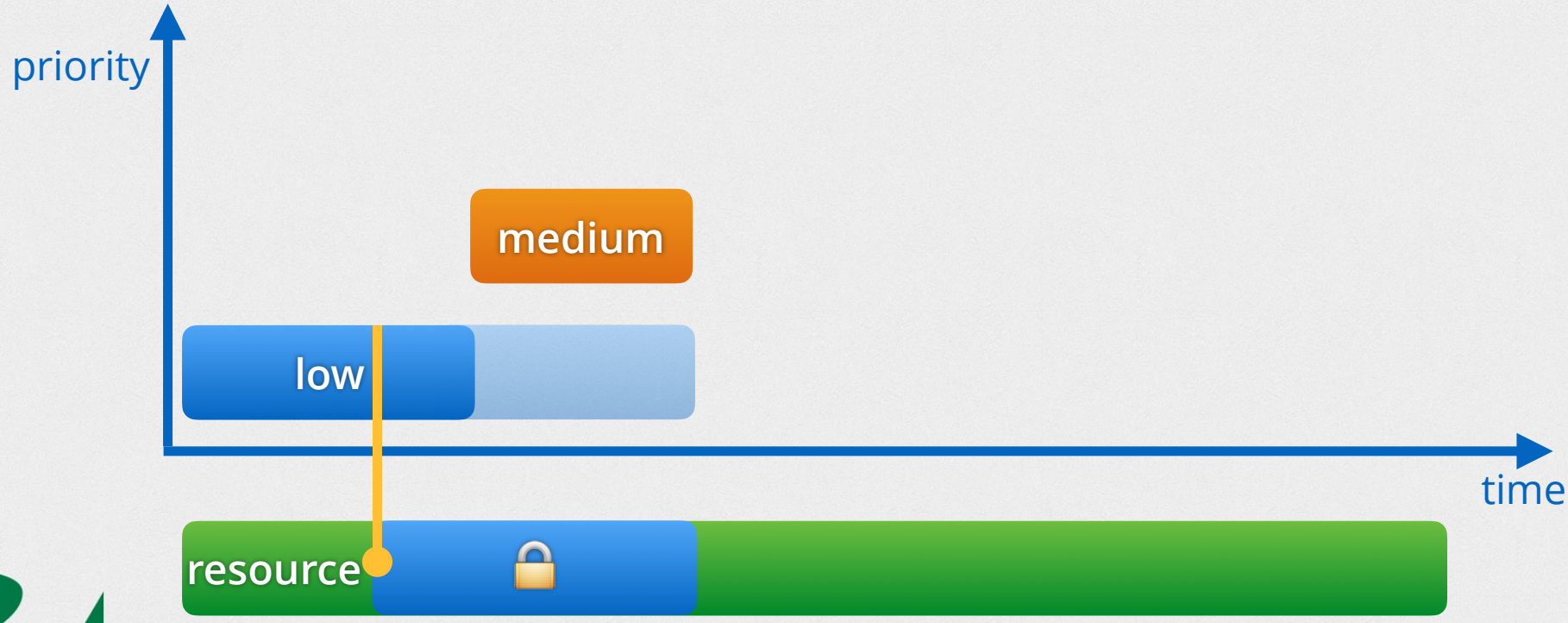

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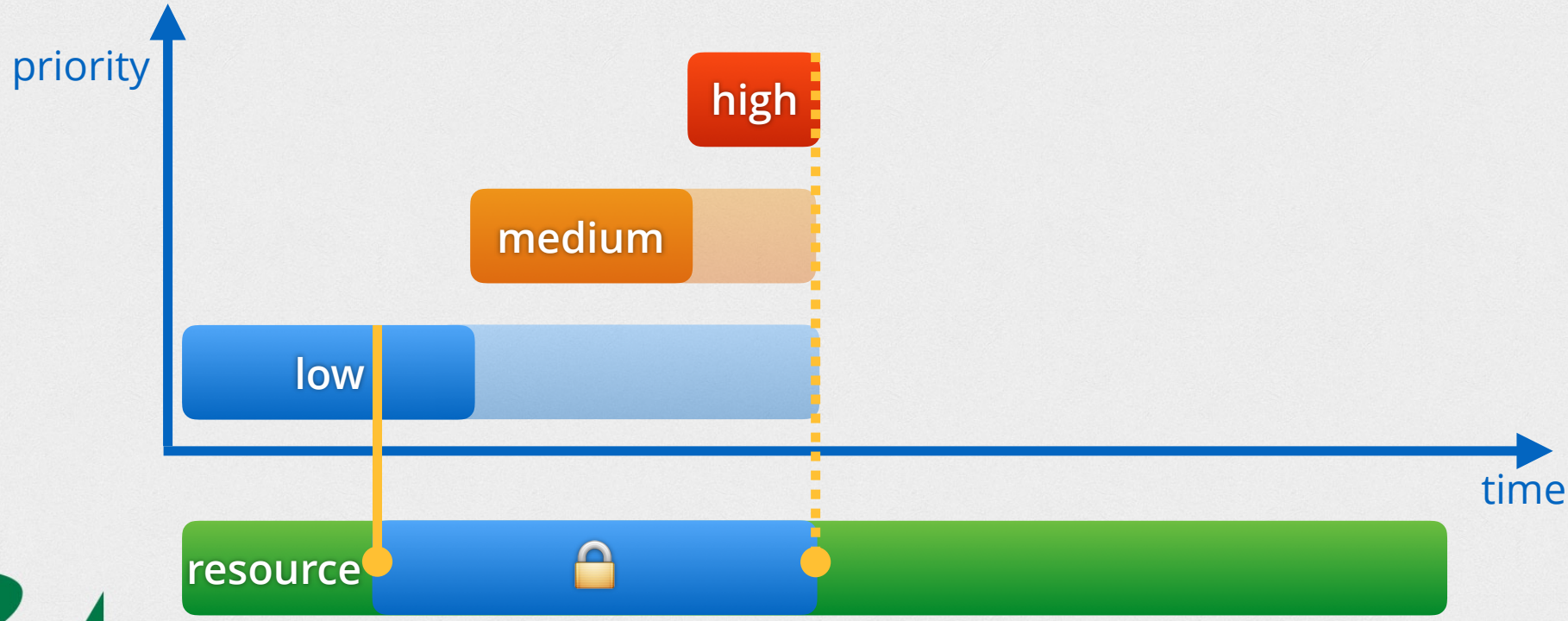

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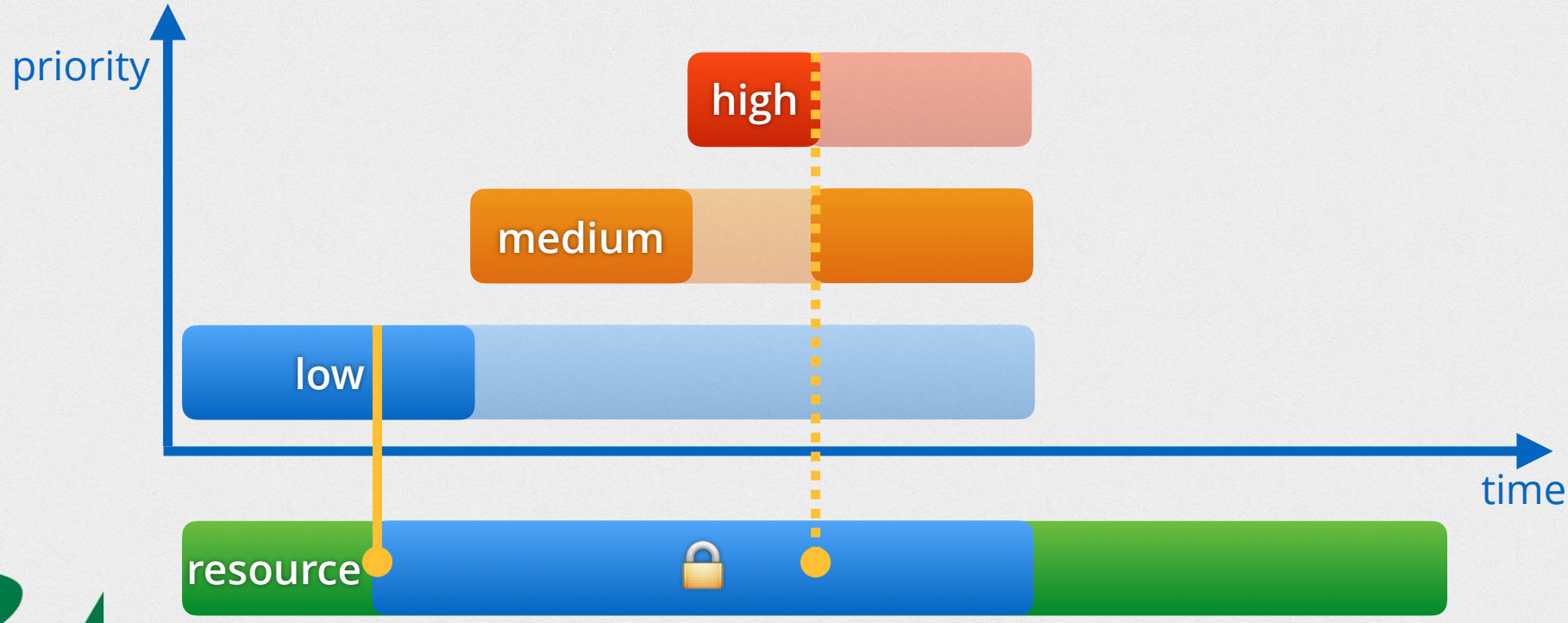

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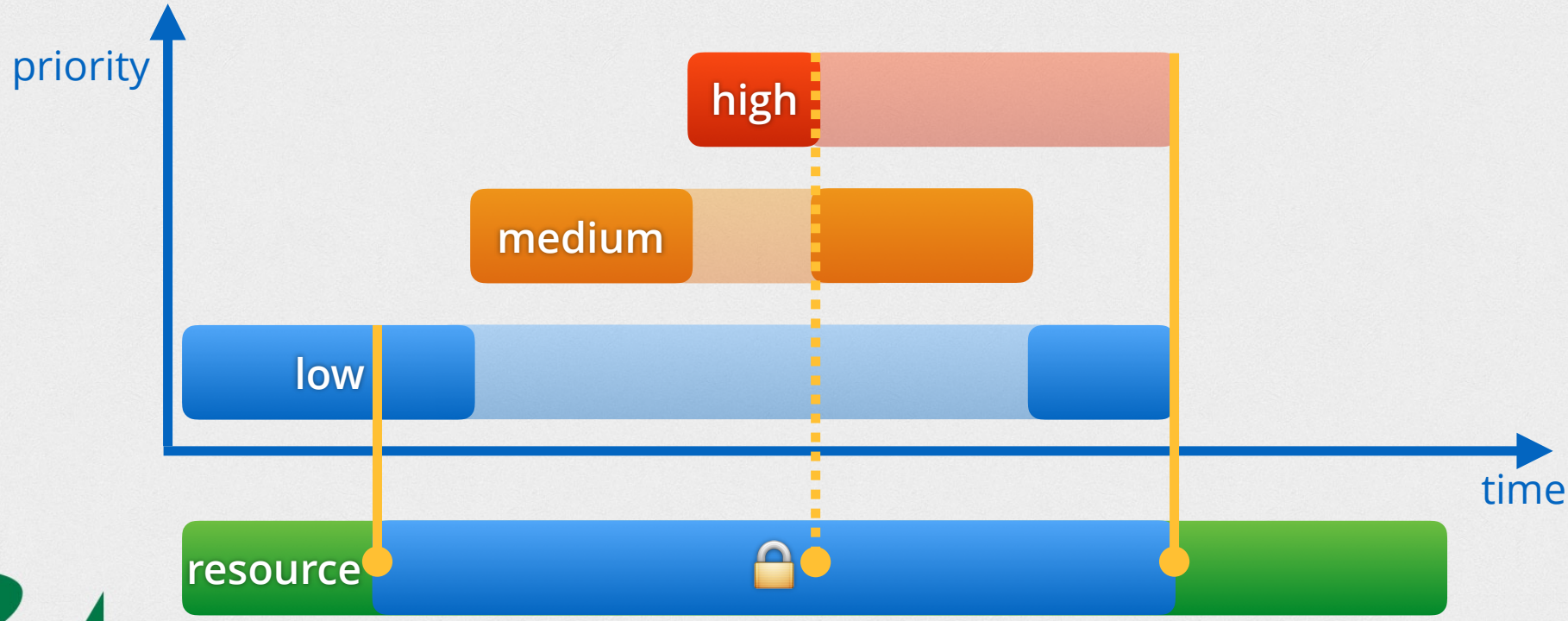

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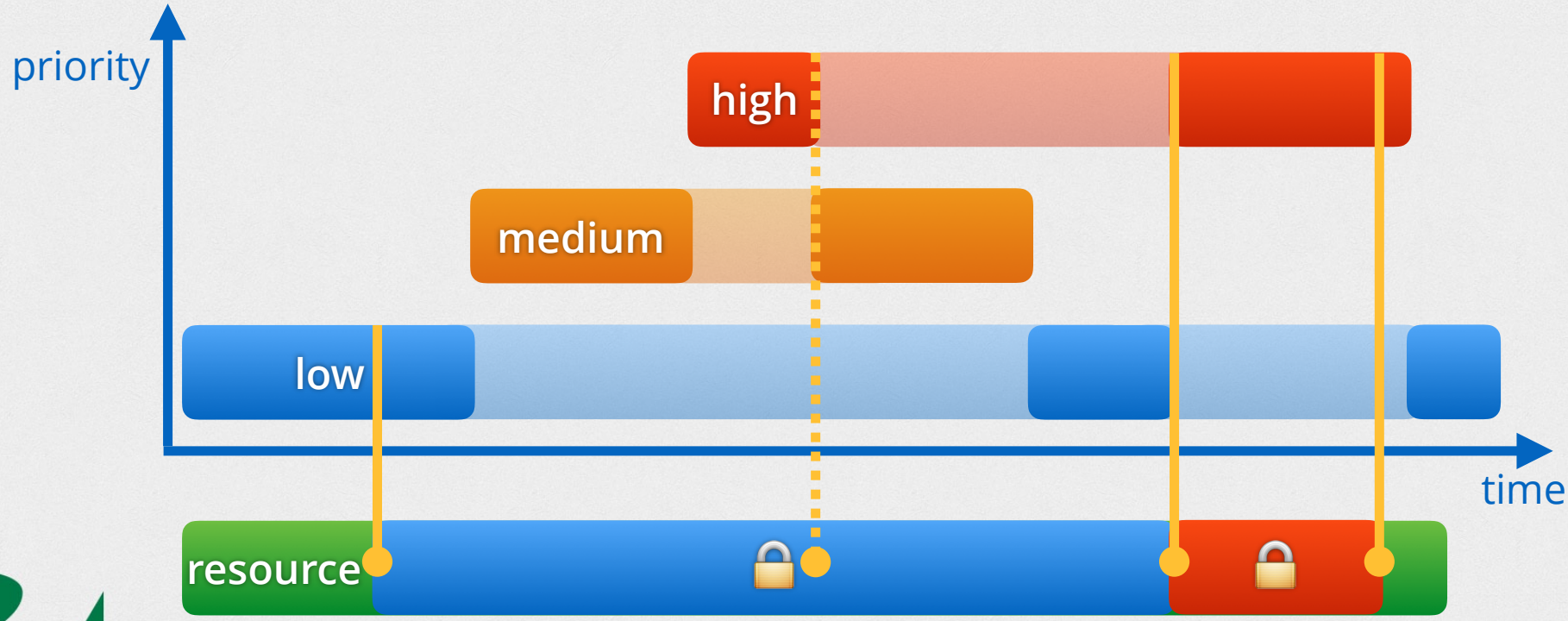

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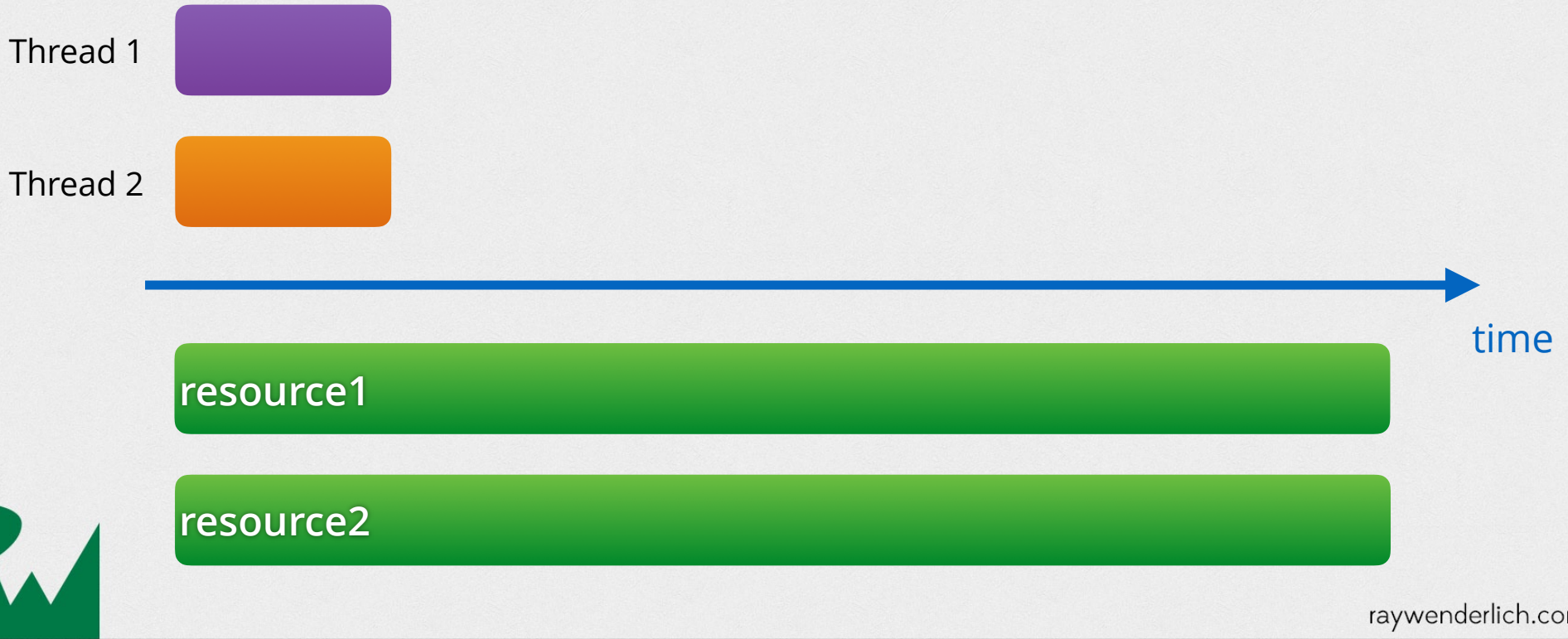
Deadlock



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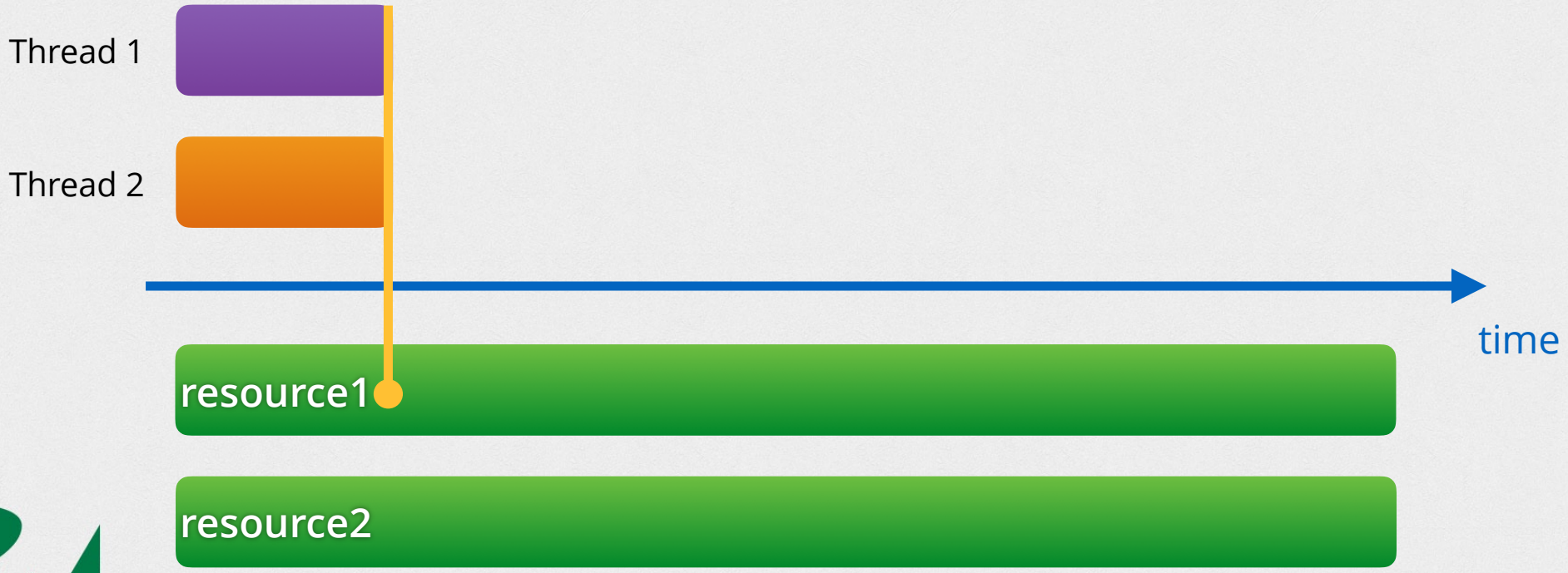

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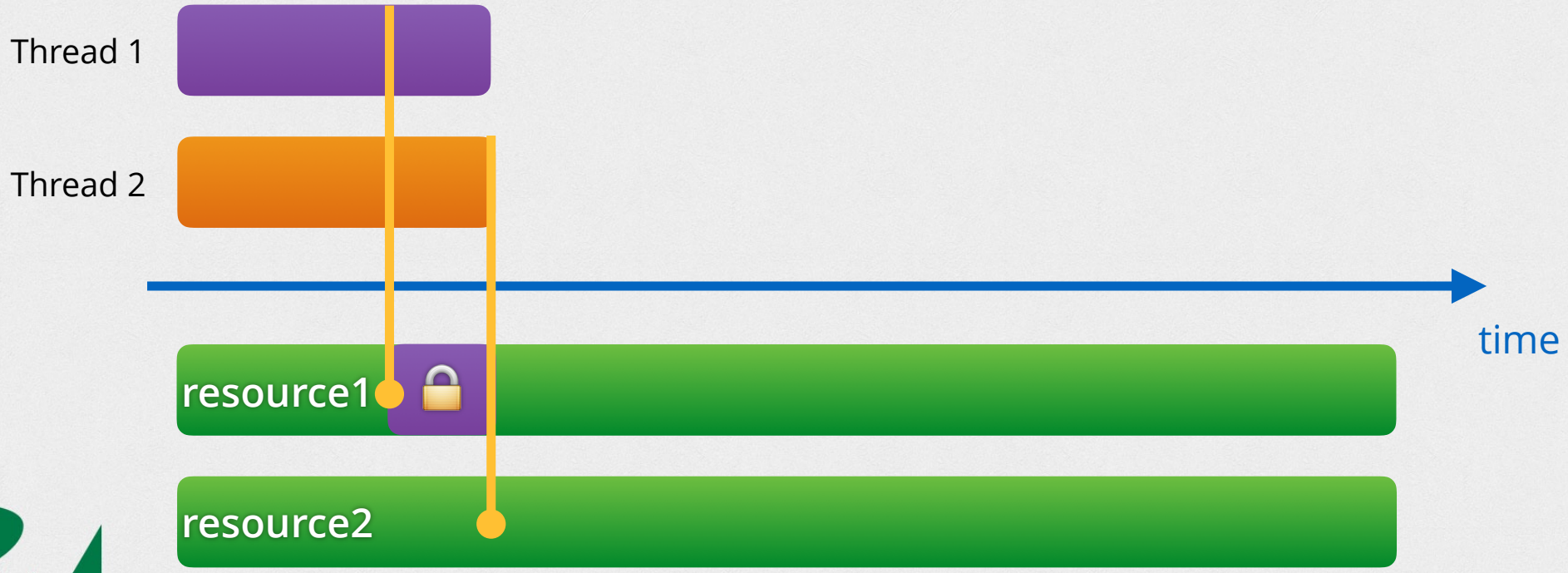

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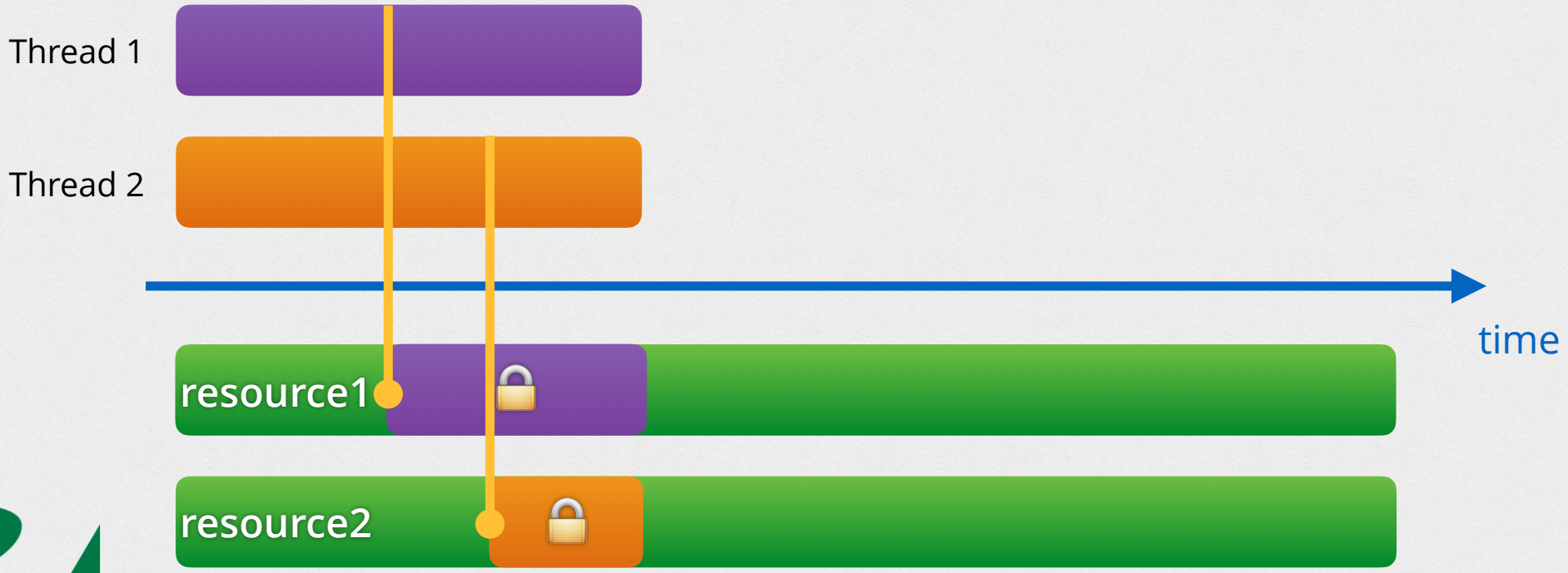

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Tasks & Queues

- Simpler abstraction
- Scales with system and conditions
- Lower overhead
- Serial queues include intrinsic locking

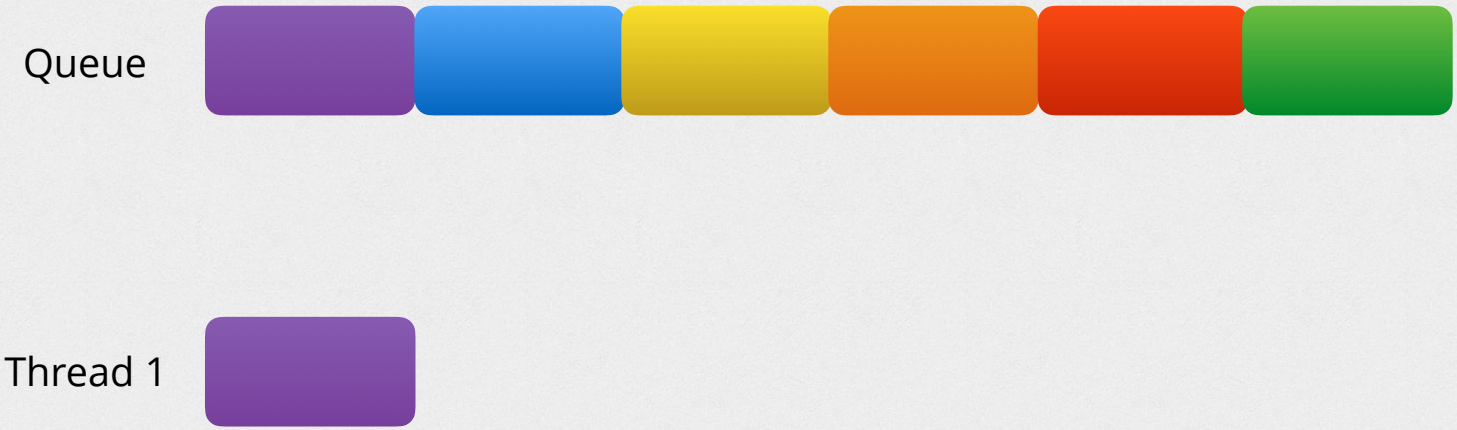
Tasks & Queues

Queue

Thread 1

Thread 2

Tasks & Queues



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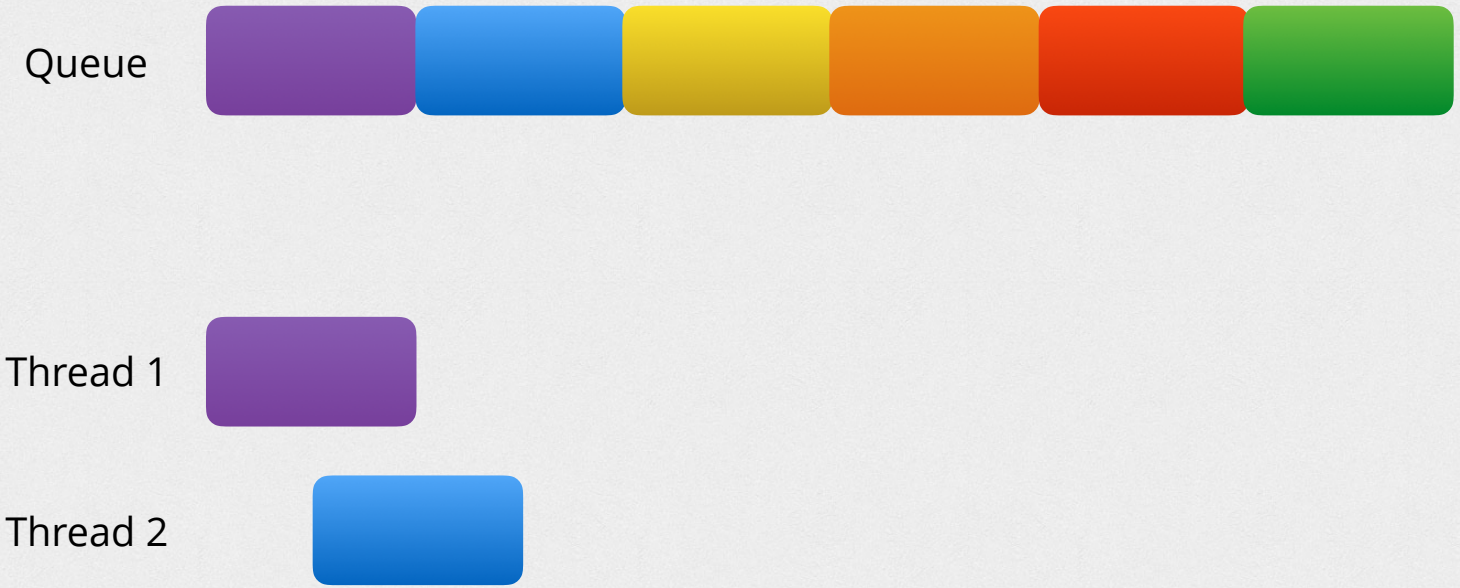

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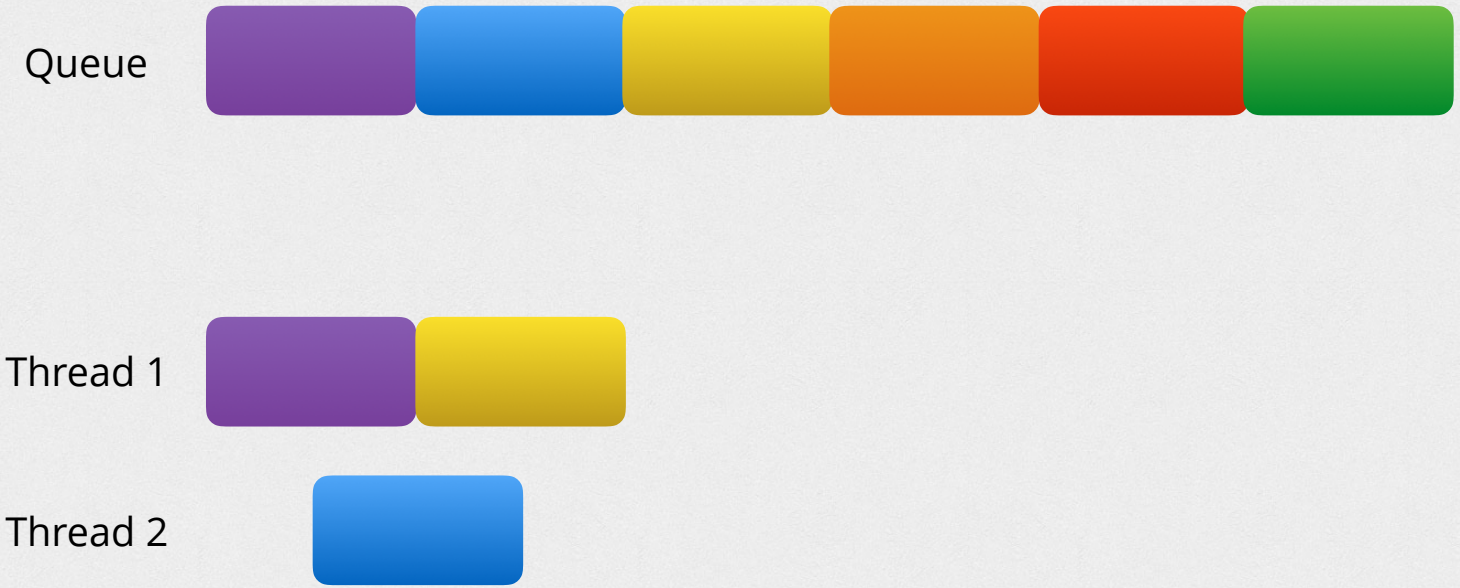

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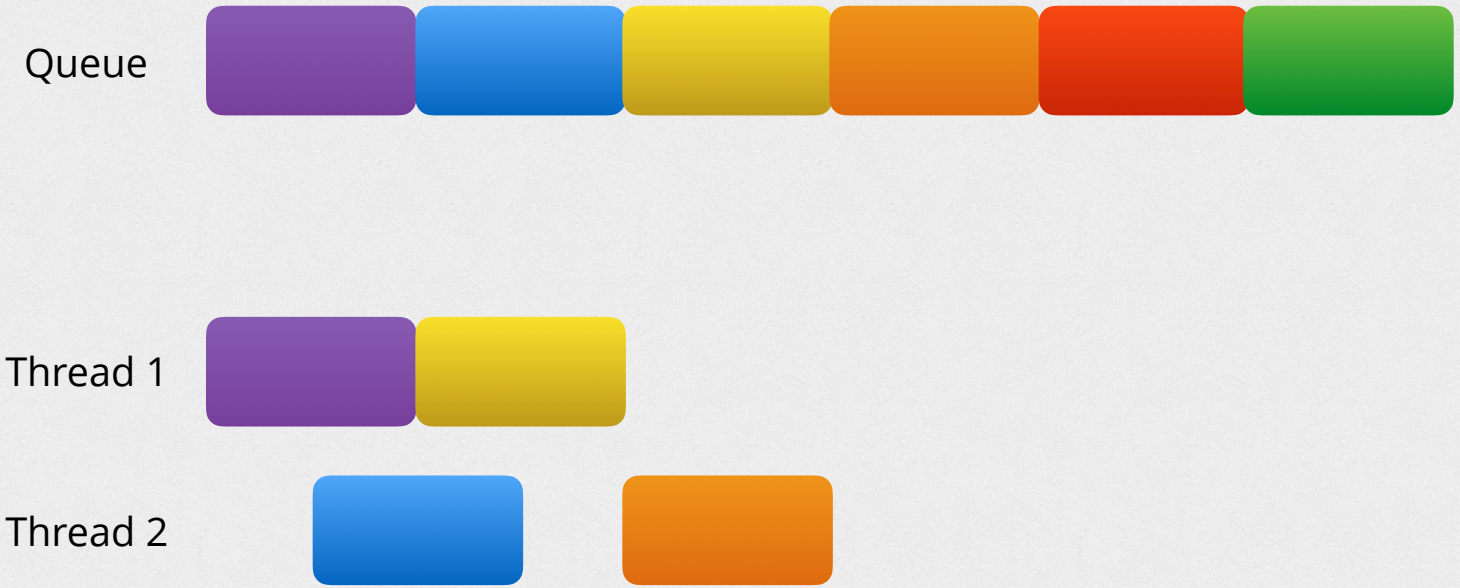

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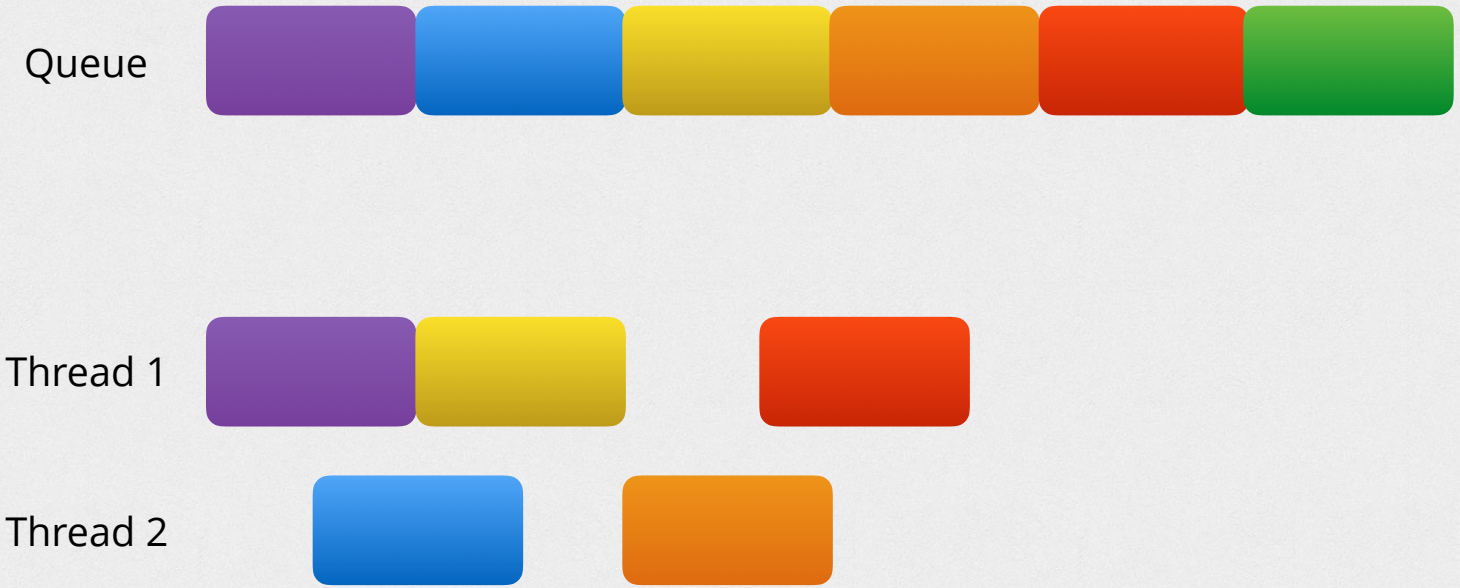

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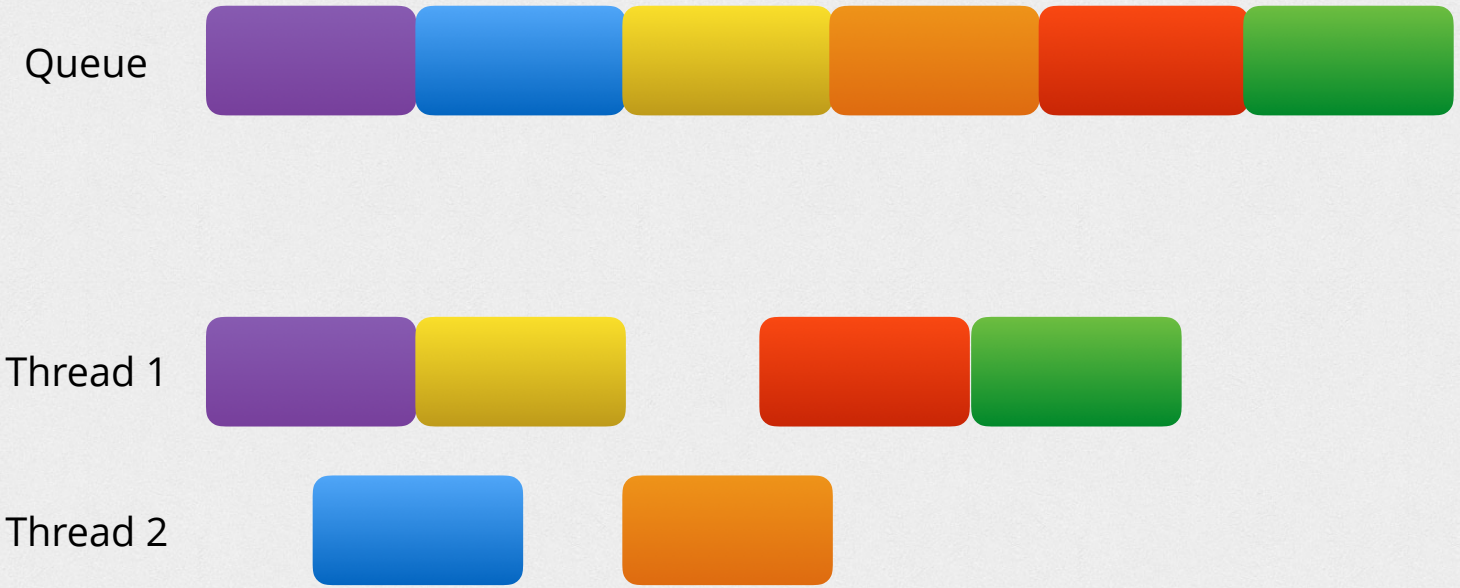
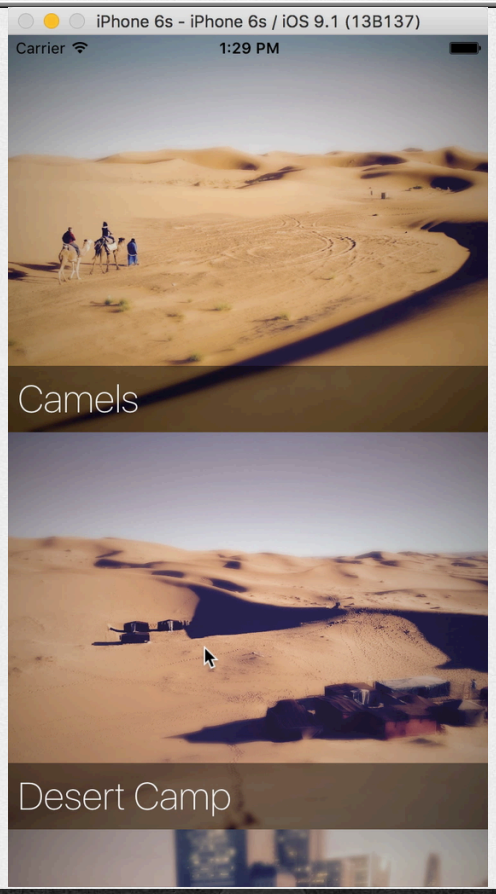


Act I: NSOperation

- NSOperation
- NSOperationQueue
- Async Operations
- Dependencies
- Cancellation
- NSOperation in Practice



Act II: Grand Central Dispatch

- Fire & Forget with GCD
- Dispatch Groups
- Thread-safe resources
- GCD Delights

Where to go from here?