

# flatMappy bird

Martin Carolan

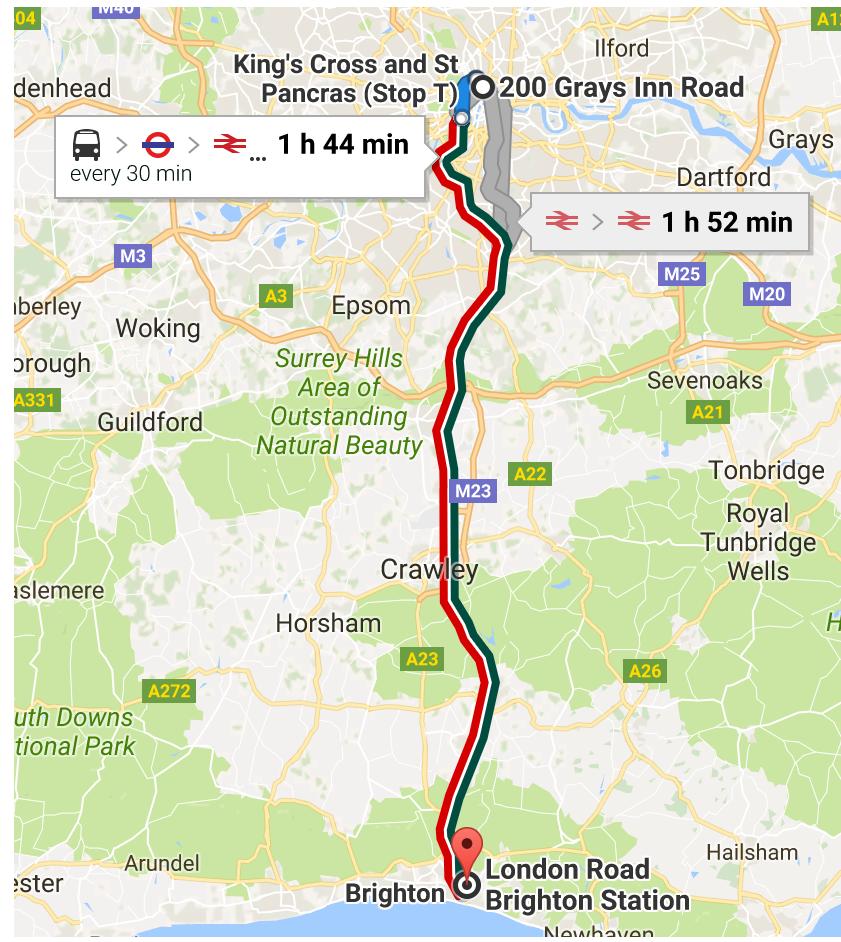
<https://github.com/mcarolan/flatmappy-bird>

@mcarolan88

[mail@mcarolan.net](mailto:mail@mcarolan.net)

# How did this all start?





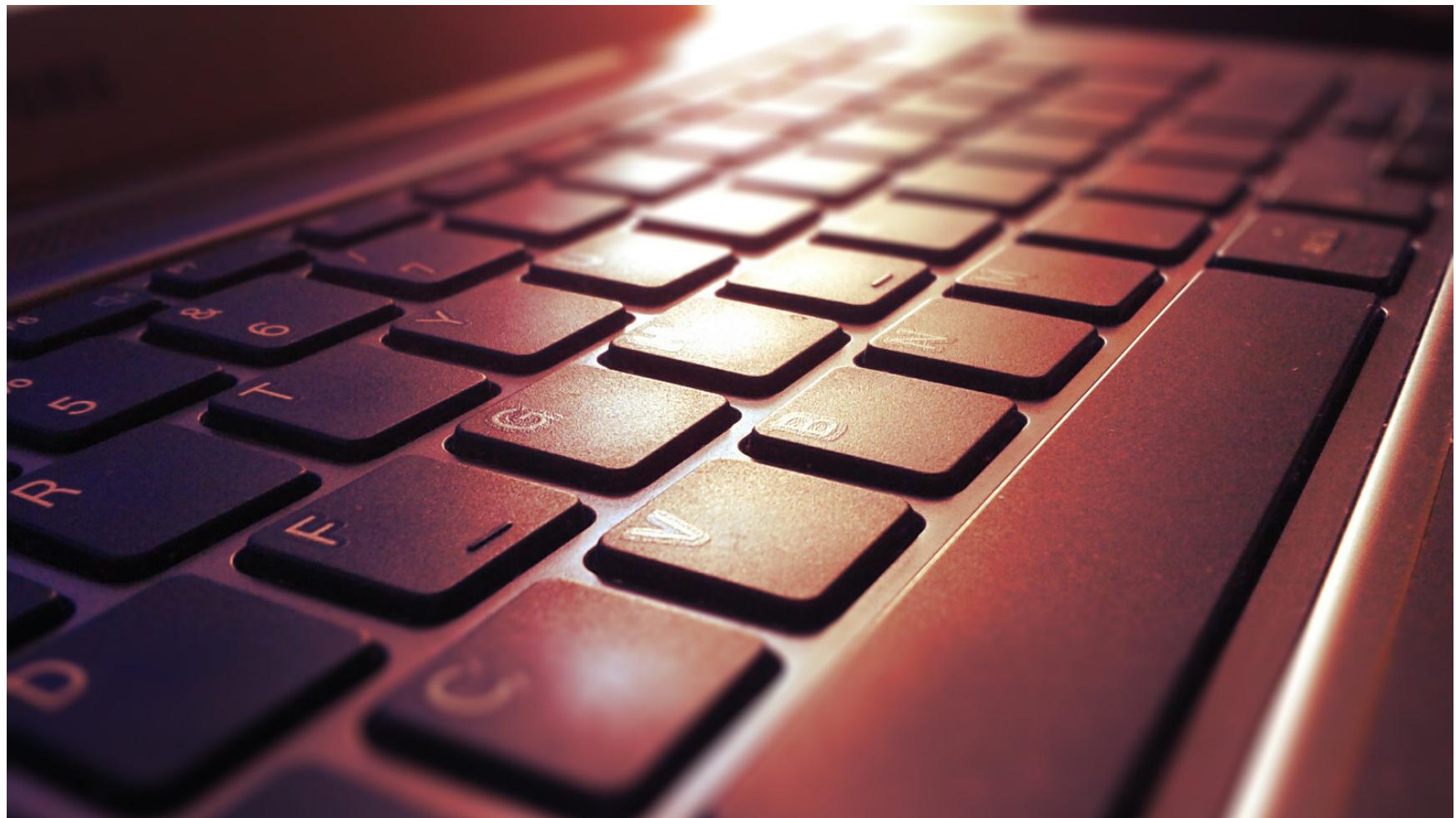
















Hands-on Scala.js

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Hands-on Scala.js

Intro to Scala.js

About Javascript

About Scala.js

Hands On

Getting Started

Making a Canvas App

Interactive Web Pages

The Command Line

Cross Publishing Libraries

Integrating Client-Server

In Depth

Advanced Techniques

# Hands-on Scala.js

Writing client-side web applications in Scala

`var x = 0.0`

`type Graph = (String, Double => Double)`

`val graphs = Seq[Graph](`

`("red", sin),`

`("green", x => abs(x % 4 - 2) - 1),`

`("blue", x => sin(x/12) * sin(x))`

`).zipWithIndex`

`dom.setInterval(() => {`

`x = (x + 1) % w; if (x == 0) clear()`

`for (((color, f), i) <- graphs) {`

`val offset = h / 3 * (i + 0.5)`

`val y = f(x / w * 75) * h / 30`

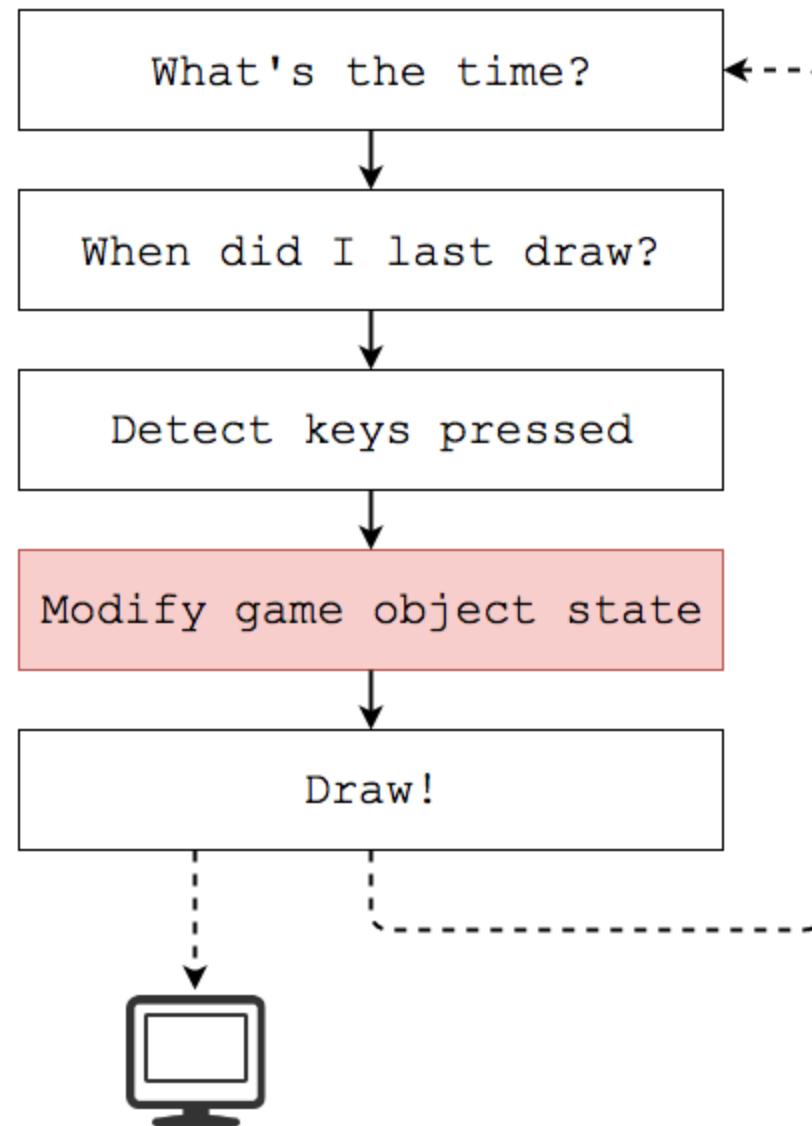
`brush.fillStyle = color`

`brush.fillRect(x, y + offset, 3, 3)`

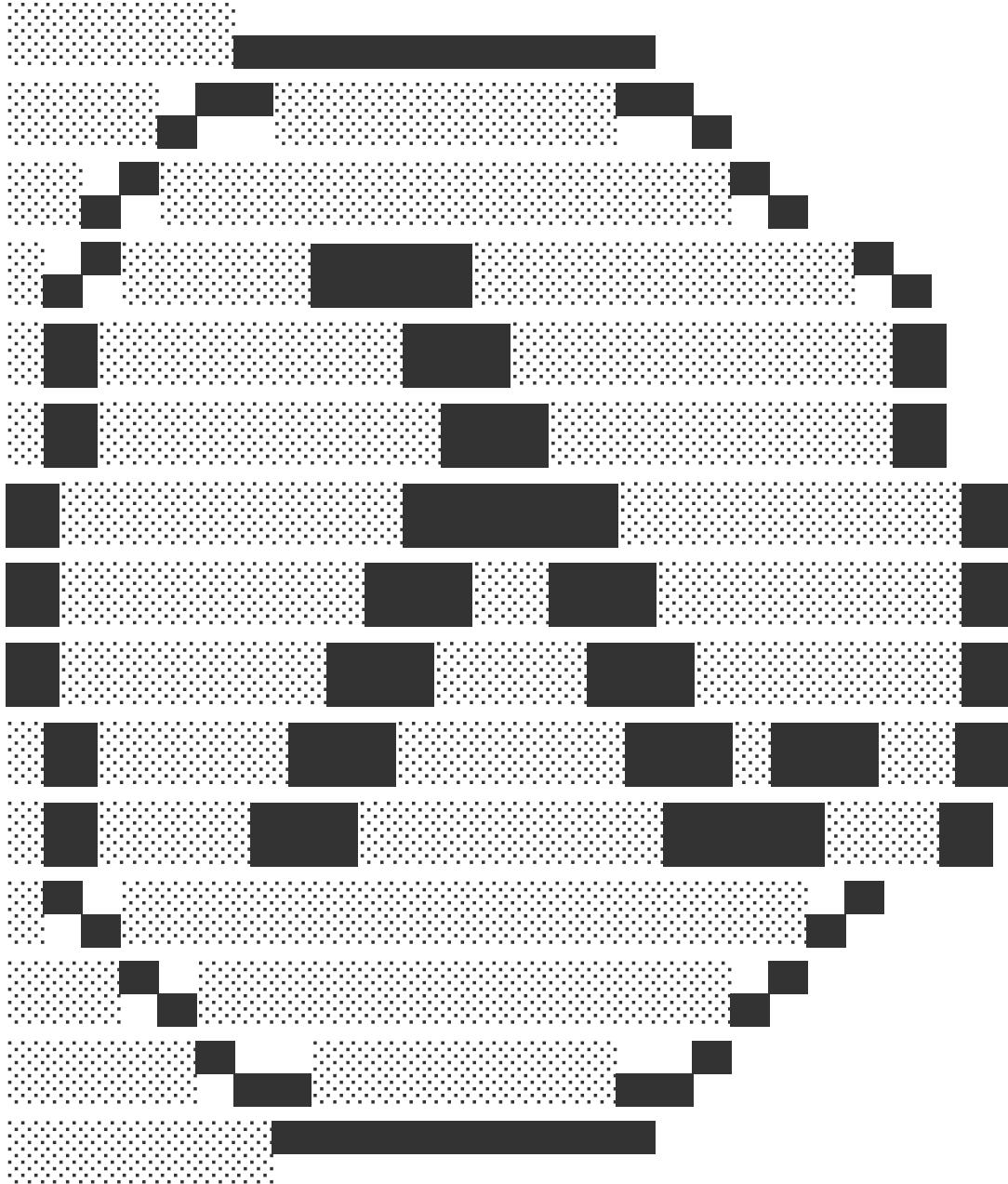
`}`

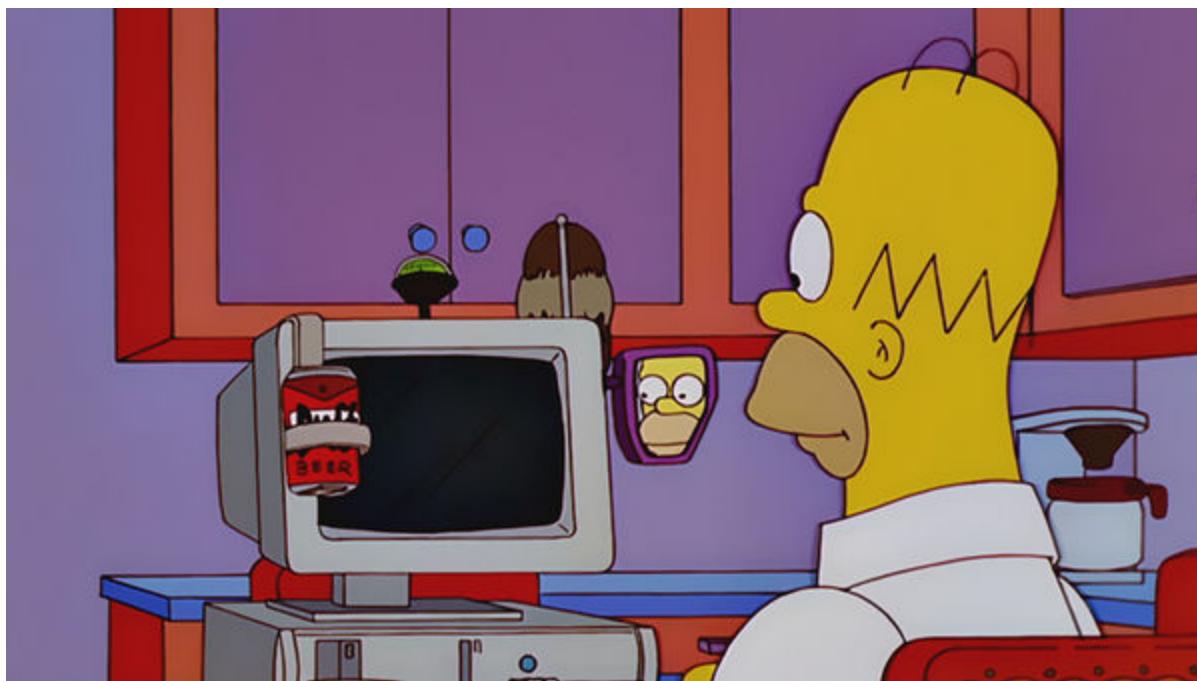


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Branch: master → codeblog / 2012 / 2012-01-17-declarative-game-logic-afrp.md Find file Copy path

blastrock Fixed typos ca581f2 on 1 Oct 2013

2 contributors

429 lines (301 sloc) 18.2 KB Raw Blame History

# Purely Functional, Declarative Game Logic Using Reactive Programming

In the [previous article](#) I introduced the `Coroutine` data type. In this second part I will show how coroutines can be used to implement a fixed time-step reactive programming library and use that library for modeling a simple game. The code examples will require a [basic proficiency](#) in reading Haskell code.

<https://github.com/leonidas/codeblog/blob/master/2012/2012-01-08-streams-coroutines.md>

<https://github.com/leonidas/codeblog/blob/master/2012/2012-01-17-declarative-game-logic-afrp.md>

# CoRoutine

# CoRoutine

Transformers of time varying values, e.g:

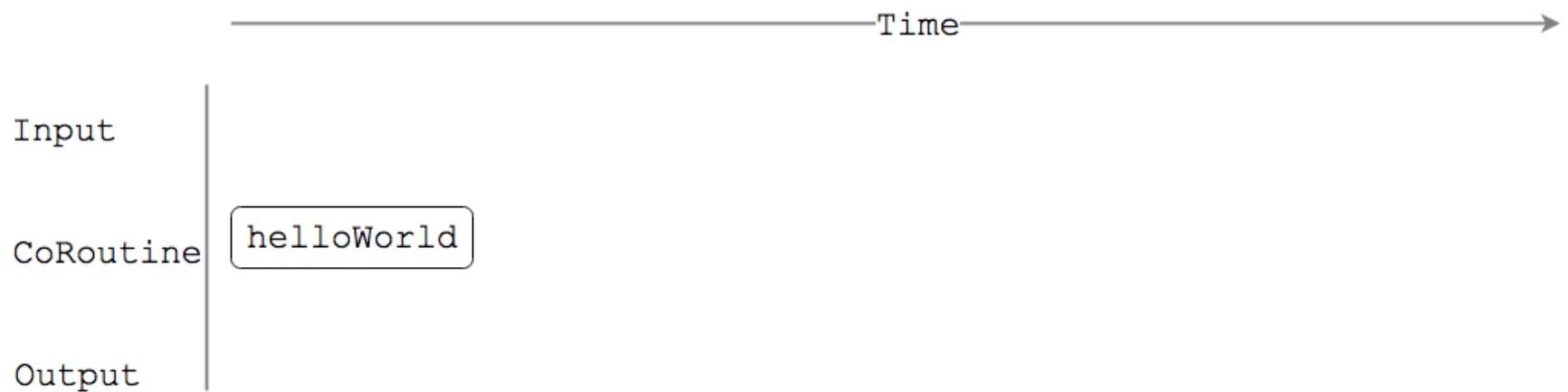
- Head of a queue
- Keyboard state
- Temperature

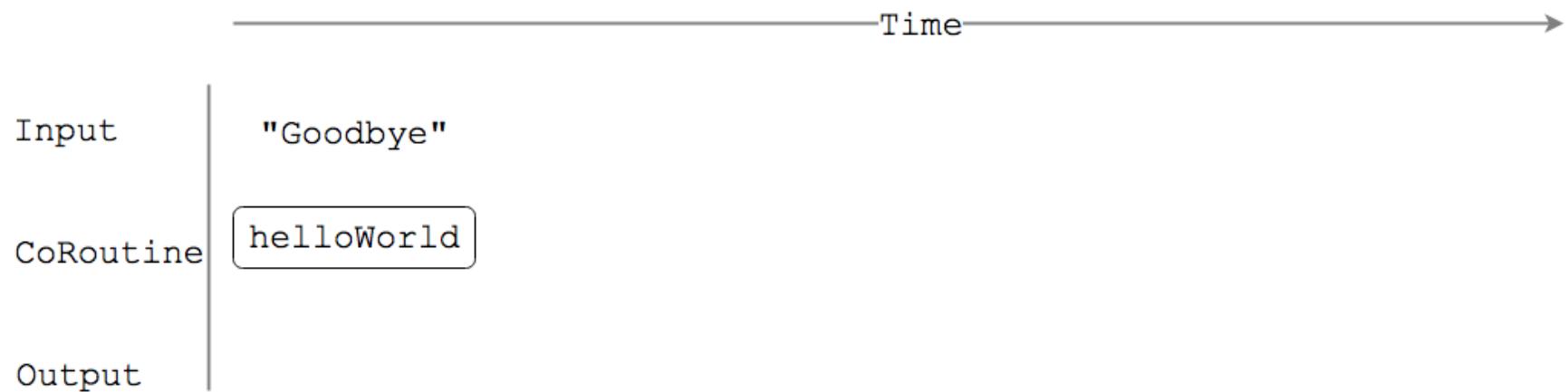
# Problem

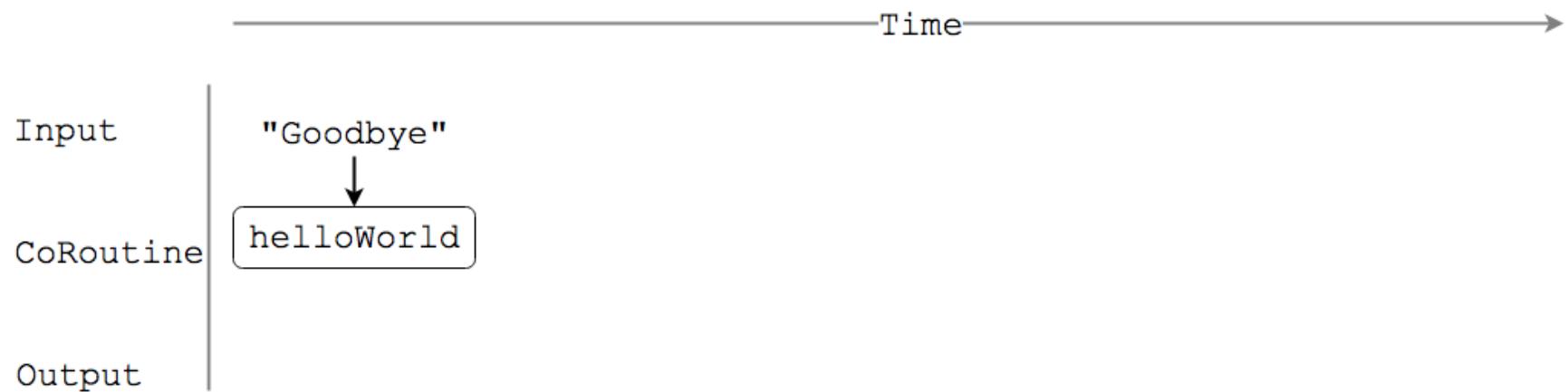
There is a time varying `String` value.

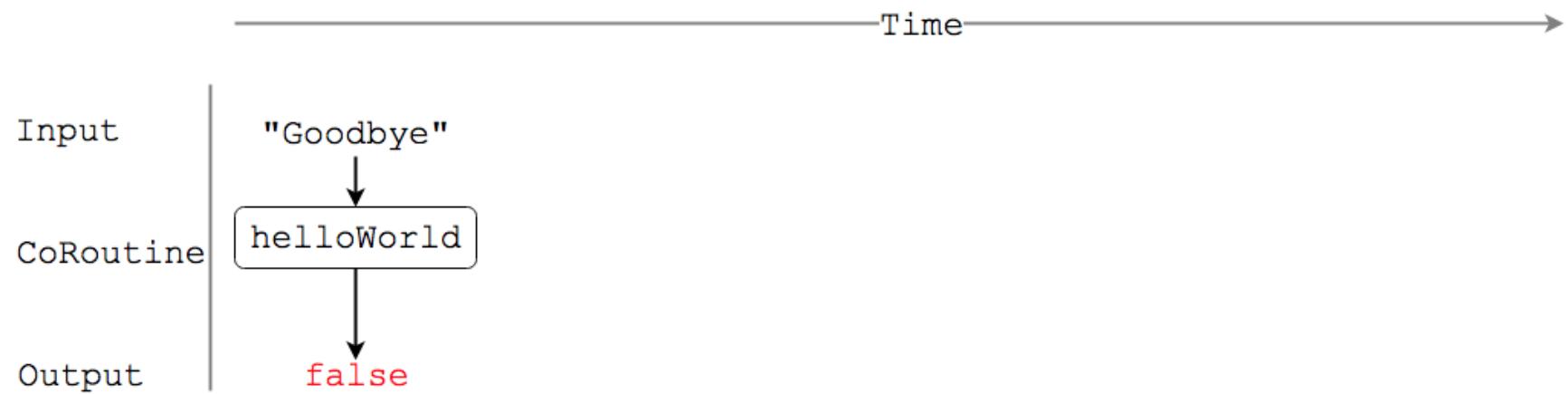
We want to transform it to a time varying `Boolean`:

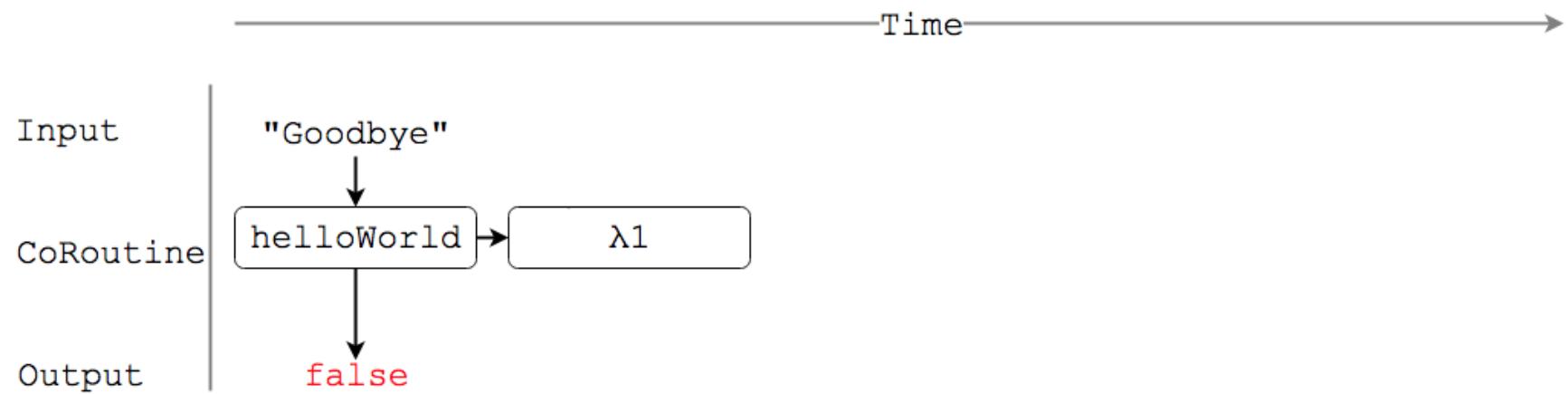
- The latest value of the `String` is "World"  
AND
- The previous value of the `String` was "Hello"

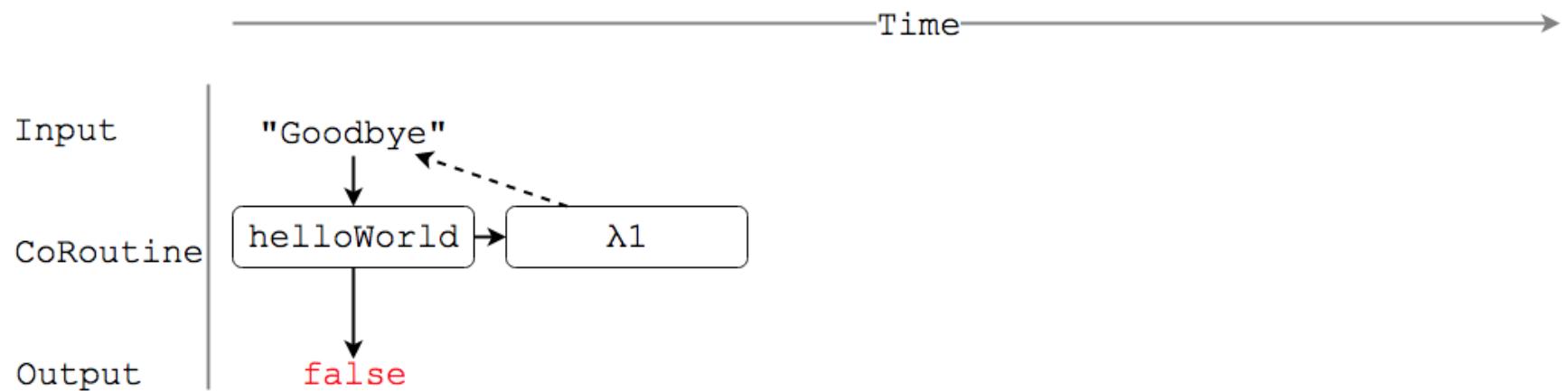


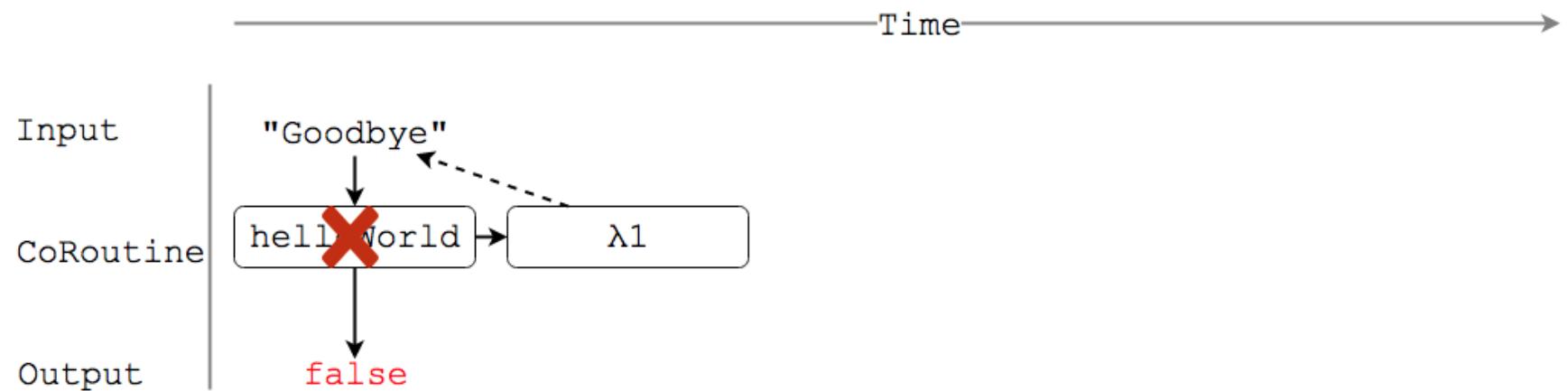


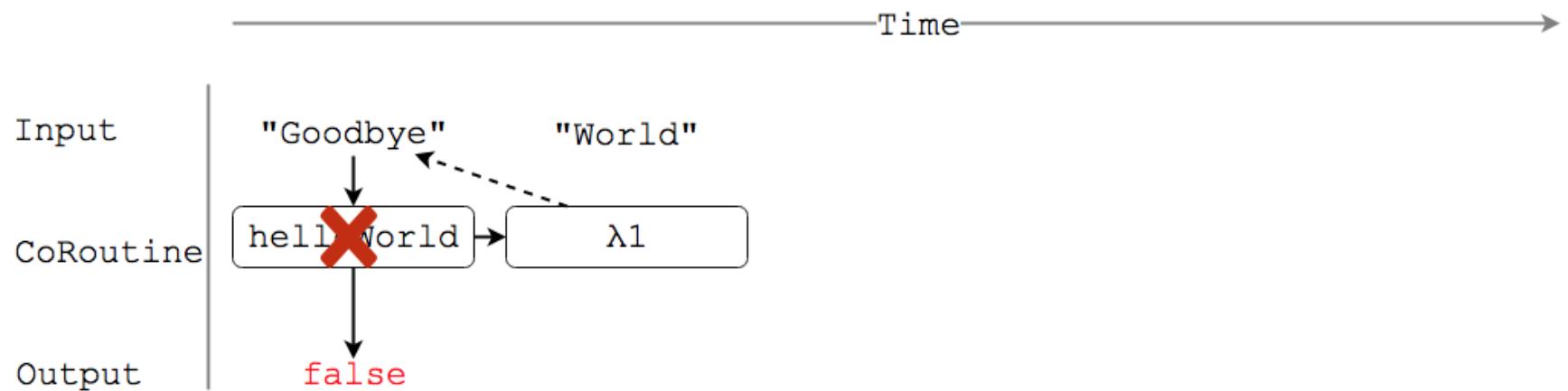


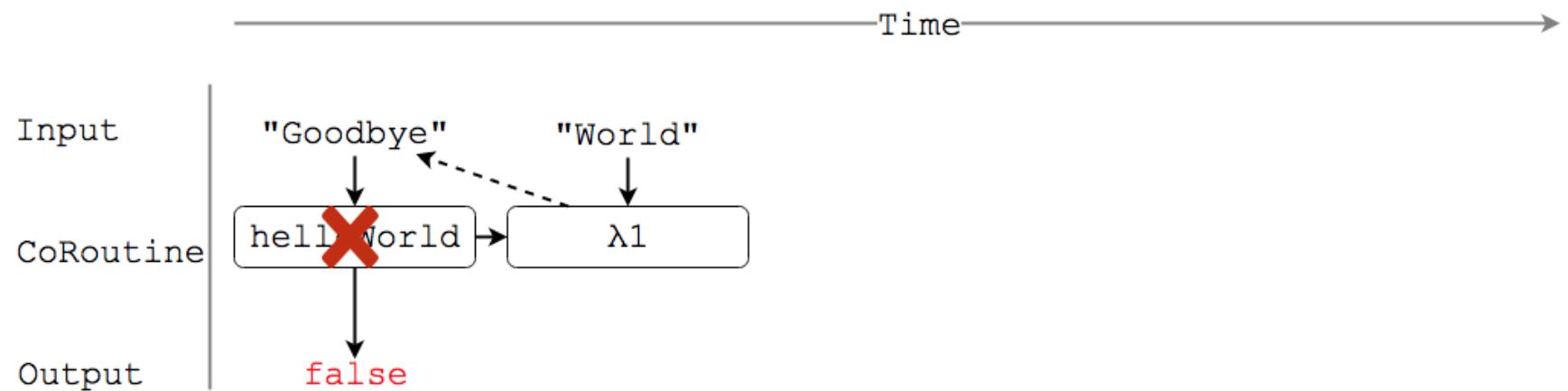


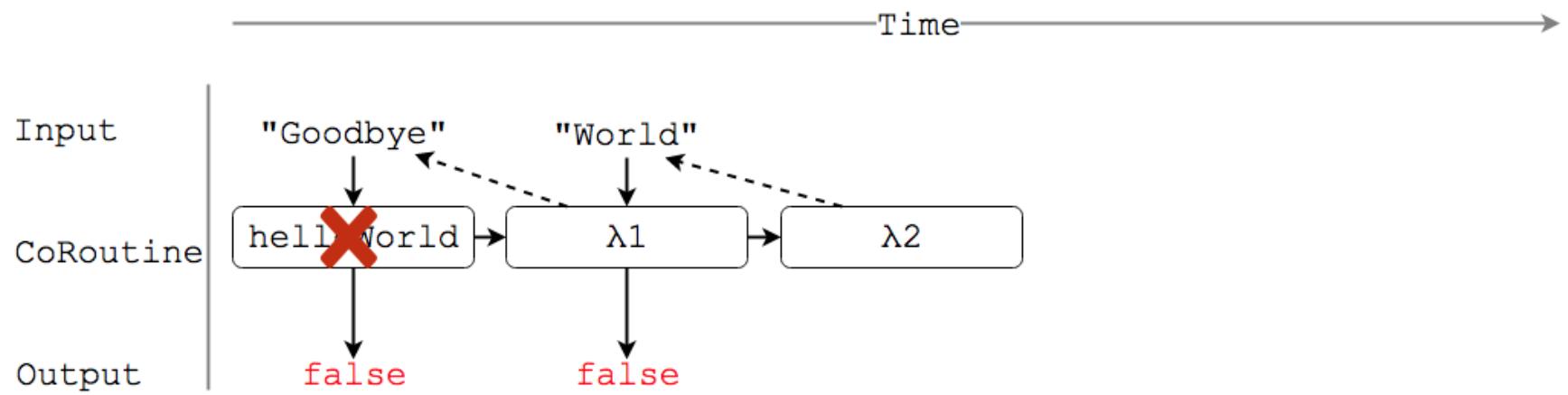


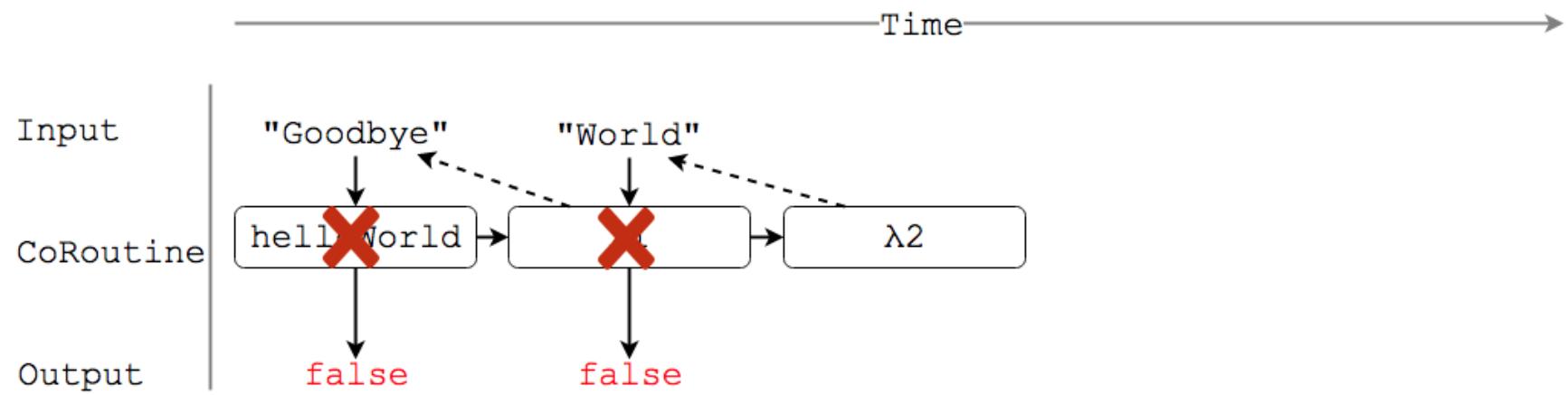


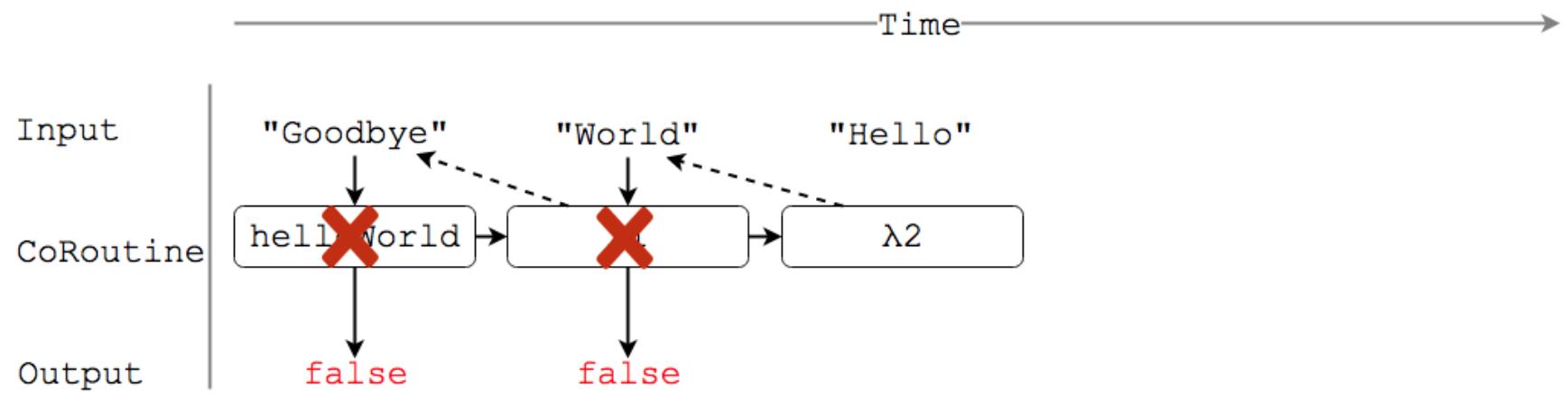


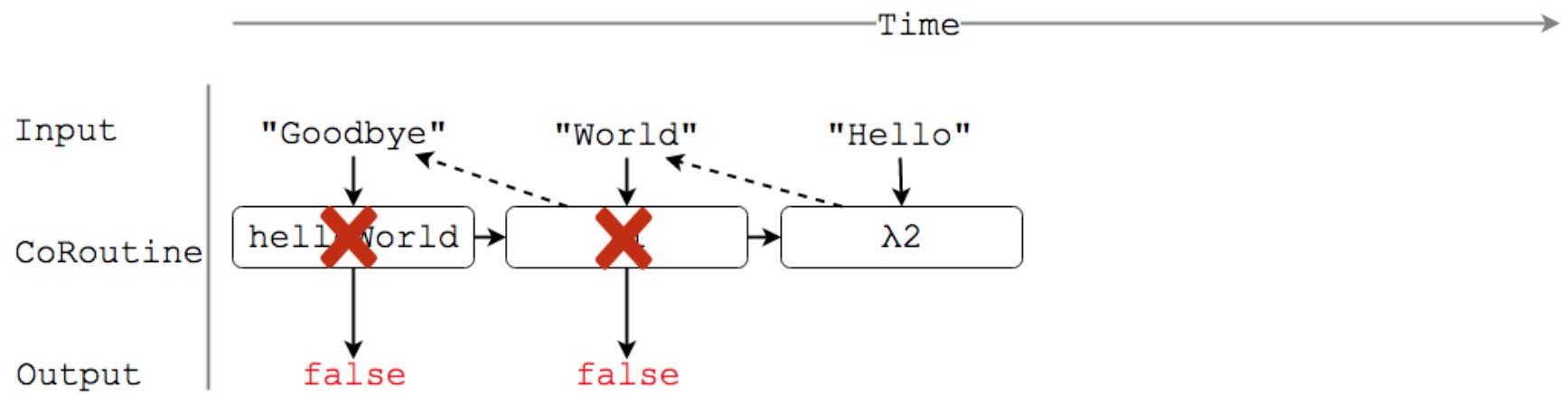


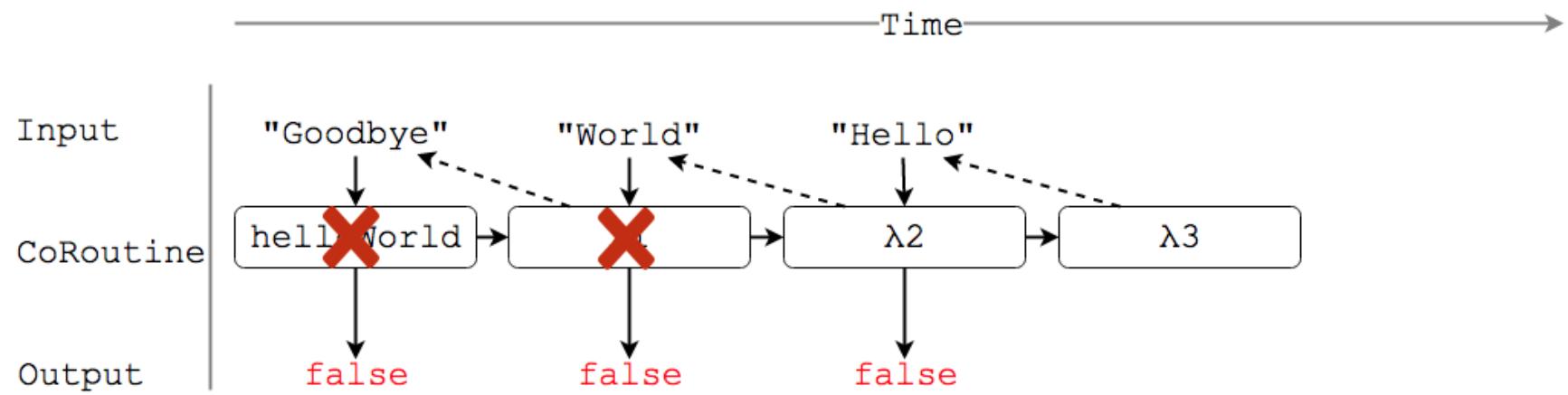


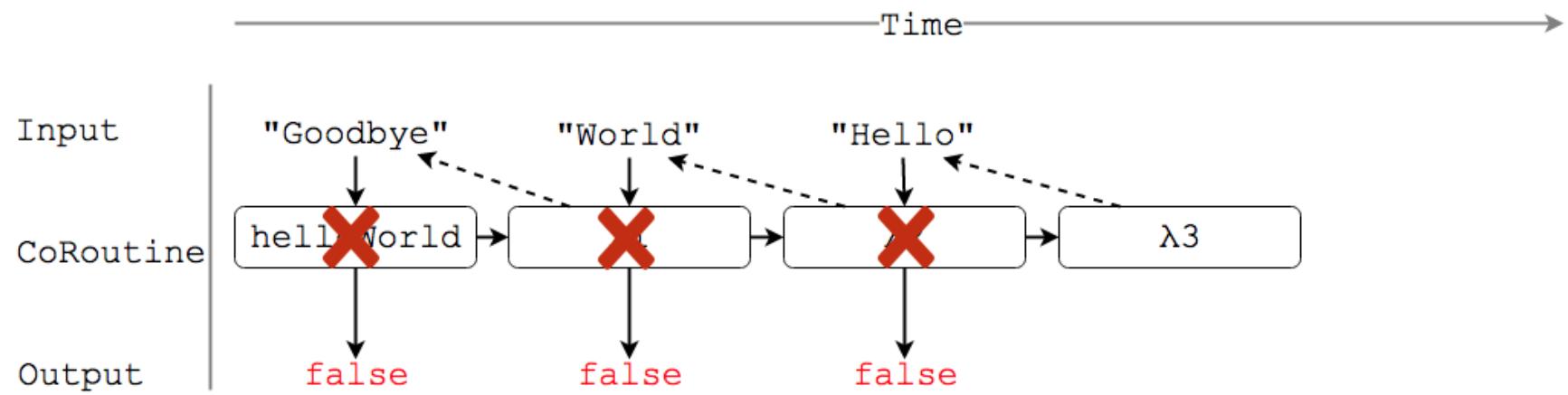


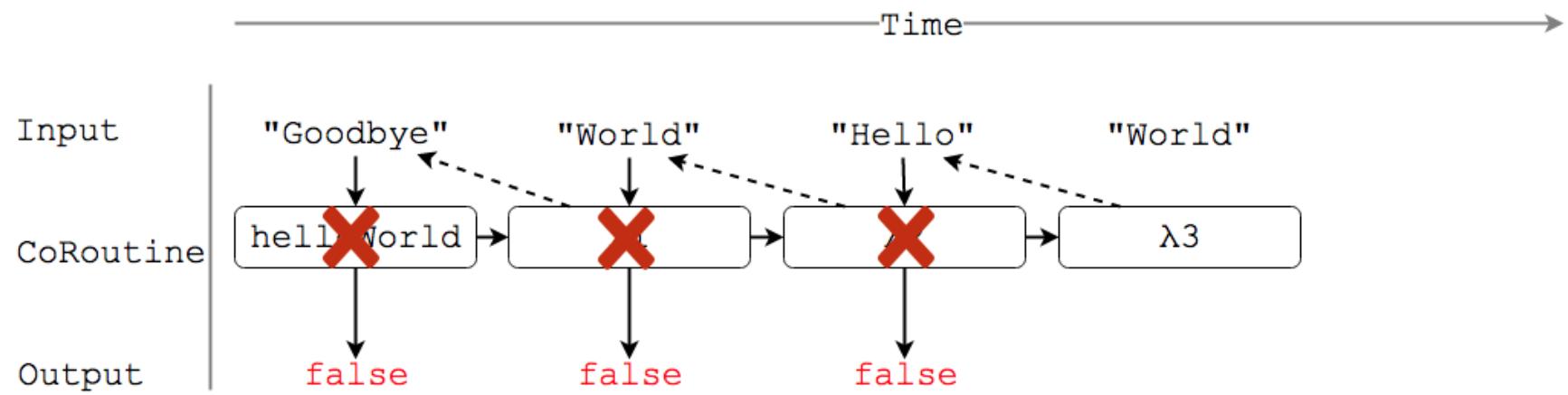


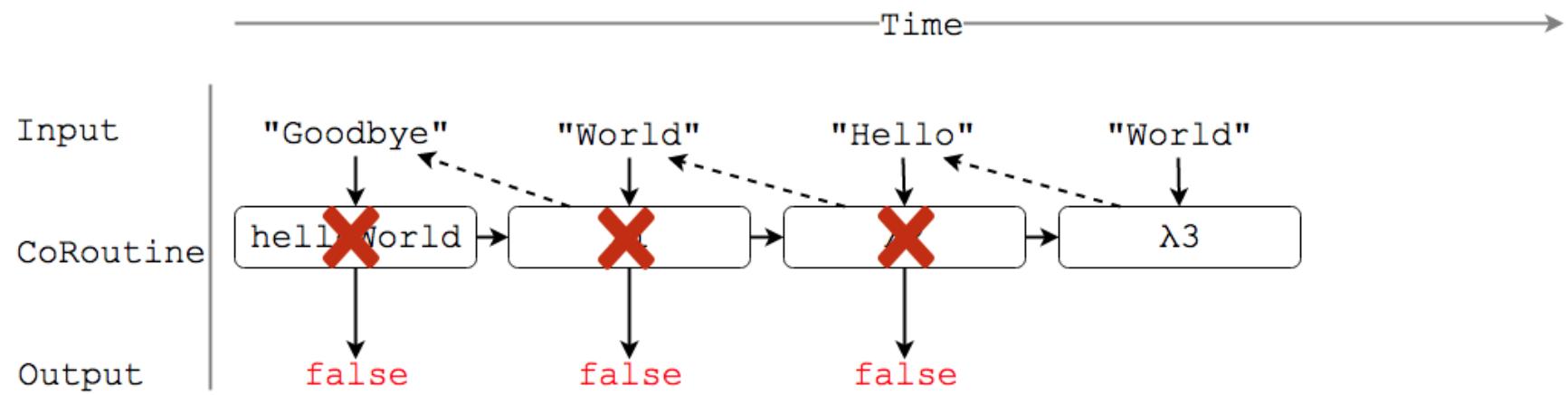


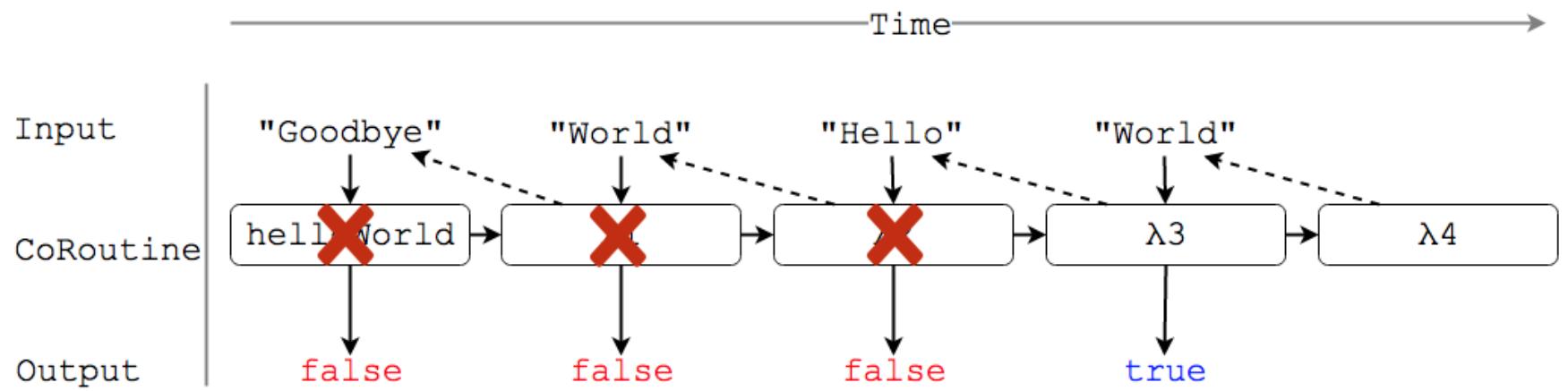


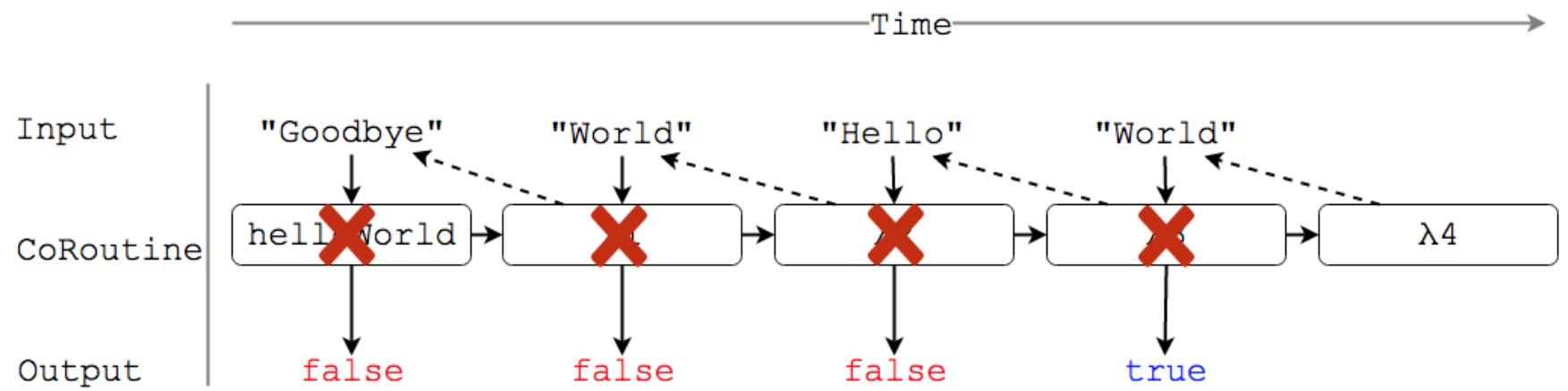






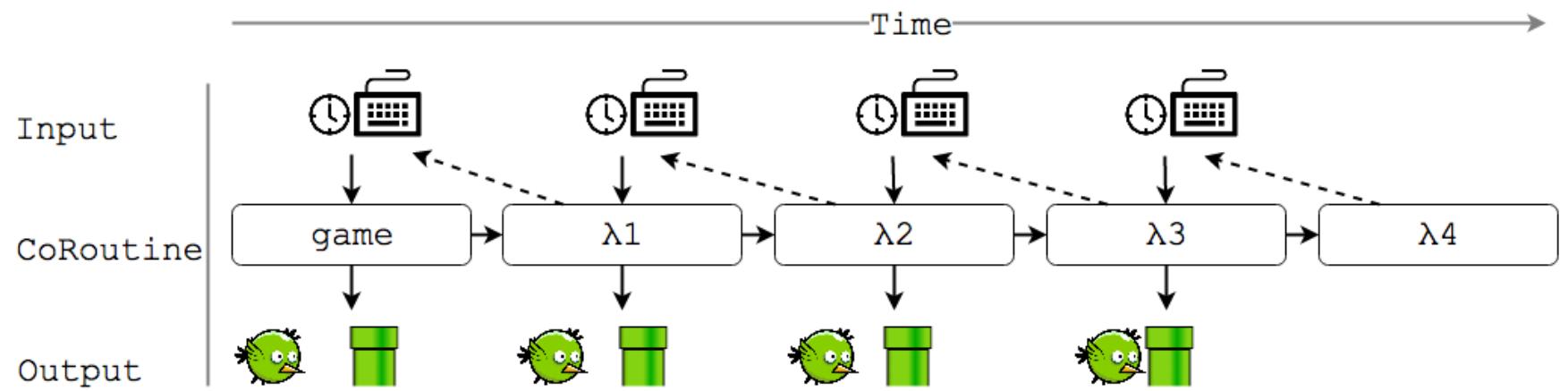






```
trait CoRoutine[A, B] {  
    def apply(input: A): (B, CoRoutine[A, B])  
}
```

```
val helloWorld: CoRoutine[String, Boolean] = ???  
  
val (res1, helloWorldNext) = helloWorld("Hello")  
println(res1)  
  
val (res2, helloWorldNextNext) = helloWorldNext("World")  
println(res2)
```





Ok interesting, what's the game?

# Demo

**What time varying values are in this game?**

- Clock
- Keyboard input

- Clock
  - Player falls at a constant rate with regards to current clock reading
  - Pipe moves at a constant rate with regards to current clock reading
- Keyboard input
  - Player rises at a constant rate with regards to whether the space bar key is currently pressed

```
case class GameState(player: Player, pipe: Pipe, lost: Boolean)  
val game: CoRoutine[(Set[Key], Time), GameState] = ???
```

## Building blocks

map, >>>

case study

none crazy applications

pNhwM5-77ihw8-oTwyQb-dteNS-bkSYHH-4u3pAF-a6Yj8h-  
6pypTD-kZSzJ3-fcryvD-ajC5LU-9De9QT-7zizEa-eCgF8-  
kj3Ru-eV1rEG-aEuC9-6dVK9j-6pypBR-jm7aq-5g1duM-  
xoEbF2-o5epCf-6pCXbS-6h6Zu8-6pyiwZ-6pCvB7-6pCy21-  
4cog75-7AcTfS-e6XAqK-4uo2MP-6pCs1m-6ASZJU-e1YtBB-  
6huVMT-d2iPZW-8jEqvi-977fud-6A7aJZ-6vmzV-gjmyZ-  
69QmoH-8cNM7c-pTTjA

<http://www.deviantart.com/art/Gaming-Icons-179546229>

<https://www.flickr.com/photos/marianopaulin02/16895155137/in/photolist-rJY61e-dN1SXG-49sN6T-dZa635-tfS3xJ-tfTcFJ-xNNHo6-bvVDie-wR9Mt9-5Z5q7d-o4EsFw-7q9qBF-6dYoeL-4qyEp4-cRGCeL-72tLMF-bFxRCV-5tWxwf-5tWxV3-7x7o1q-d8atD7-5tSaJe-4nWKA7-ese74Y-xAMYw-4myiwF-oqisgw-cRGChh-9BVHmk-7dcFo-8jqLdc-6sHJFL-6yq1bj-g9FyfG-DWtde-7bNZYS-cRGCD1-662Gp4-cRJxT1-7edja8-bw1FpU-kZo7LT-4WrmRD-obNw2V-69W4Z4-7FSUUK-c55zTU-7TawMW-d8auR5-36Tf5s>