Learning Elixir and Erlang with Advent of Code and Exercism: advantages and challenges

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adolfont.github.io

Presentation script

- Who am I?
- What is Advent of Code?
- What is Exercism?
- What is good/bad in AoC/Exercism?
- **How to use AoC and/or Exercism to learn Erlang and/or Elixir?**

Who am I?

- Professor at the Federal University of Technology – Parana (UTFPR)
- Co-host of Elixir em Foco (Elixir in Focus) podcast (in Brazilian Portuguese)
- Member of the Education, Training, & Adoption Working Group of the Erlang Ecosystem Foundation
- YouTube EN, YouTube PT, Instagram, Telegram, GitHub, Twitch, TikTok...

Which are the difficulties in learning Elixir and Erlang?

- Common programming pitfalls
- Erlang/Elixir pitfalls
  - Functional programming concepts
  - Syntax details
  - Not knowing the best practices of the communities
  - Concurrency/OTP (difficult by itself)

What helps? (in my opinion)

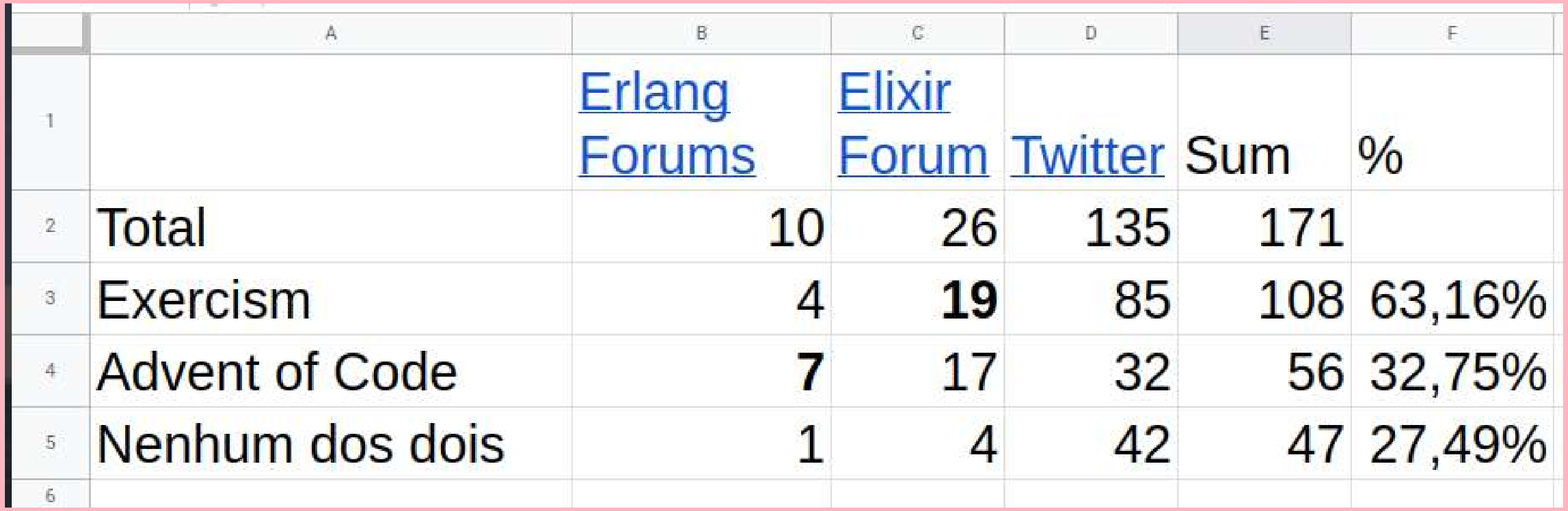
- Reading books or well-structured materials (Elixir School)
- Having a mentor
- Chatting with other people
- Participating in the community
  - Elixir Forum
  - Erlang Forums
  - #MyElixirStatus, #ElixirLang, #WeBEAMtogether, #Erlang
  - Elixir World
- Listening to podcasts
- What else?

What helps? (in my opinion)

- Putting knowledge into practice - just a little bit above your current level
- Write code idiomatically, the way more experienced people in the community write

Which is most used? I don't know, but...

"Have you ever solved an Advent of Code or an Exercism challenge?"



	A	B	C	D	E	F
1		Erlang Forums	Elixir Forum	Twitter	Sum	%
2	Total	10	26	135	171	
3	Exercism	4	**19**	85	108	63,16%
4	Advent of Code	**7**	17	32	56	32,75%
5	Nenhum dos dois	1	4	42	47	27,49%
6						

What is the Advent of Code?

- Website: https://adventofcode.com/
- Wikipedia: https://en.wikipedia.org/wiki/Advent_of_Code
- Creator: Eric Wastl
- Annual “event” that goes from December 1st to December 25th
  - It's a kind of competition
  - There are private leaderboards
  - What counts for the ranking is who finds the answer, usually a number, first
- So the time zone counts.

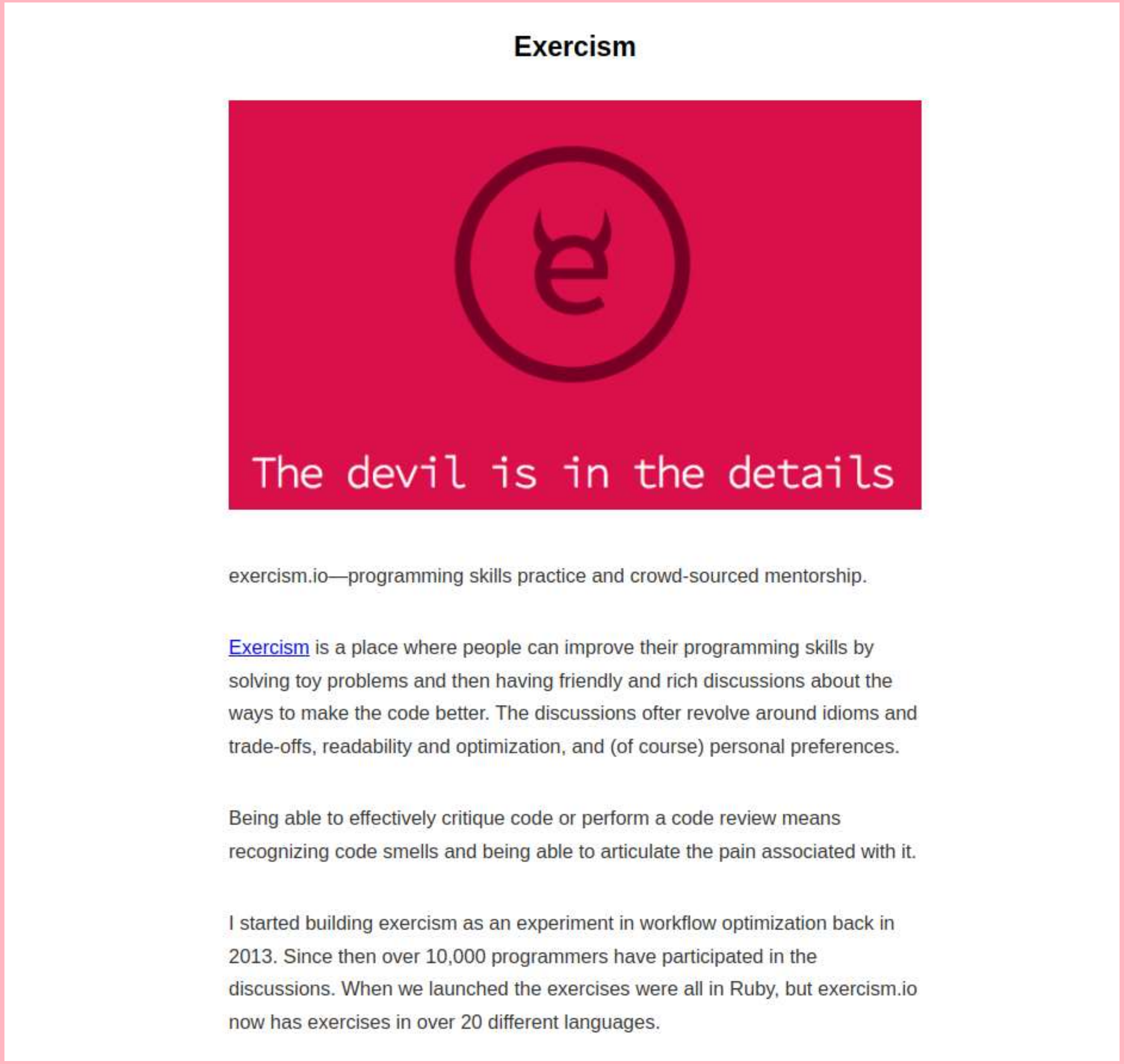
Me in Advent of Code

- 2021: 1 to 10, 13 and 14 - total 12x2 = 24
- 2020: 1 to 9 and part 1 of day 10: total 19
- 2019: 1 and 2. Total: 4

Where I am saving my solutions as of 2021
https://github.com/adolfont/pensandoemelixir/tree/main/adventofcode/

Important!

- Relatively long description (631, 577, 1002)
- Pay close attention to the wording!
  - Day 2 Part 1 2019
  - *"To do this, before running the program, replace position 1 with the value 12 and replace position 2 with the value 2."*
- Undisclosed difficulty
- Ad-hoc solutions



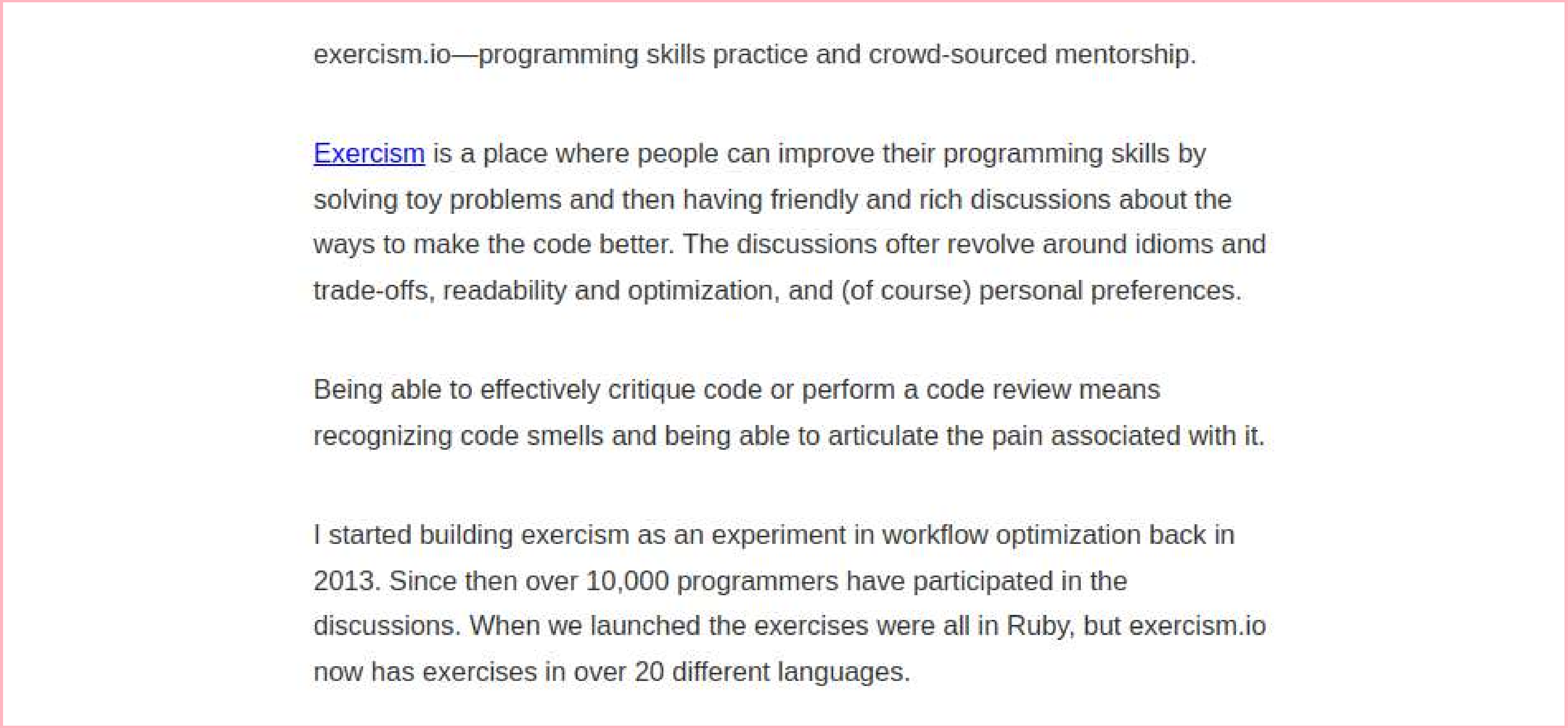
Exercism

exercism.io—programming skills practice and crowd-sourced mentorship.

Exercism is a place where people can improve their programming skills by solving toy problems and then having friendly and rich discussions about the ways to make the code better. The discussions ofter revolve around idioms and trade-offs, readability and optimization, and (of course) personal preferences.

Being able to effectively critique code or perform a code review means recognizing code smells and being able to articulate the pain associated with it.

I started building exercism as an experiment in workflow optimization back in 2013. Since then over 10,000 programmers have participated in the discussions. When we launched the exercises were all in Ruby, but exercism.io now has exercises in over 20 different languages.



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What is Exercism?

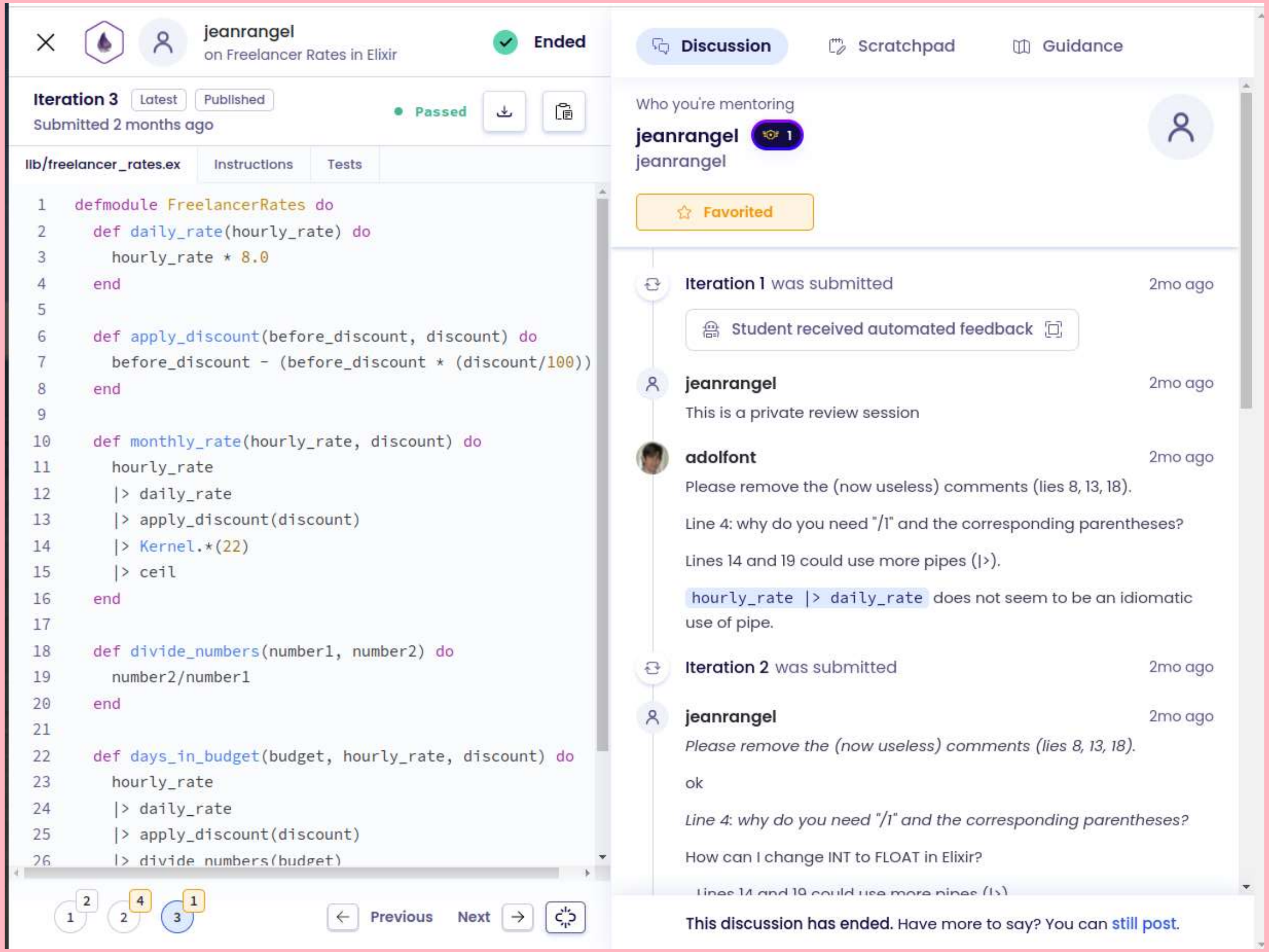
- Created by Katrina Owen
  - read https://www.kytrinyx.com/exercism/ !!!
  - and https://en.wikipedia.org/wiki/Exercism
- Exercises + free mentoring
- It gives you short descriptions (72, 96, 172)
- It provides you with tests for your programming language
- Current version: version 3

Access https://exercism.org/https://exercism.org/

Mentoring example

Private link:

https://exercism.org/mentoring/discussions/ad416ef10f1e42b4b97445f2ee672f53



```elixir
1  defmodule FreelancerRates do
2    def daily_rate(hourly_rate) do
3      hourly_rate * 8.0
4    end
5
6    def apply_discount(before_discount, discount) do
7      before_discount - (before_discount * (discount/100))
8    end
9
10   def monthly_rate(hourly_rate, discount) do
11     hourly_rate
12     |> daily_rate
13     |> apply_discount(discount)
14     |> Kernel.*(22)
15     |> ceil
16   end
17
18   def divide_numbers(number1, number2) do
19     number2/number1
20   end
21
22   def days_in_budget(budget, hourly_rate, discount) do
23     hourly_rate
24     |> daily_rate
25     |> apply_discount(discount)
26     |> divide_numbers(budget)
```

Iteration 1 was submitted 2mo ago

Student received automated feedback

jeanrangel 2mo ago

This is a private review session

adolfont 2mo ago

Please remove the (now useless) comments (lies 8, 13, 18).

Line 4: why do you need "/1" and the corresponding parentheses?

Lines 14 and 19 could use more pipes (|>).

`hourly_rate |> daily_rate` does not seem to be an idiomatic use of pipe.

Iteration 2 was submitted 2mo ago

jeanrangel 2mo ago

Please remove the (now useless) comments (lies 8, 13, 18).

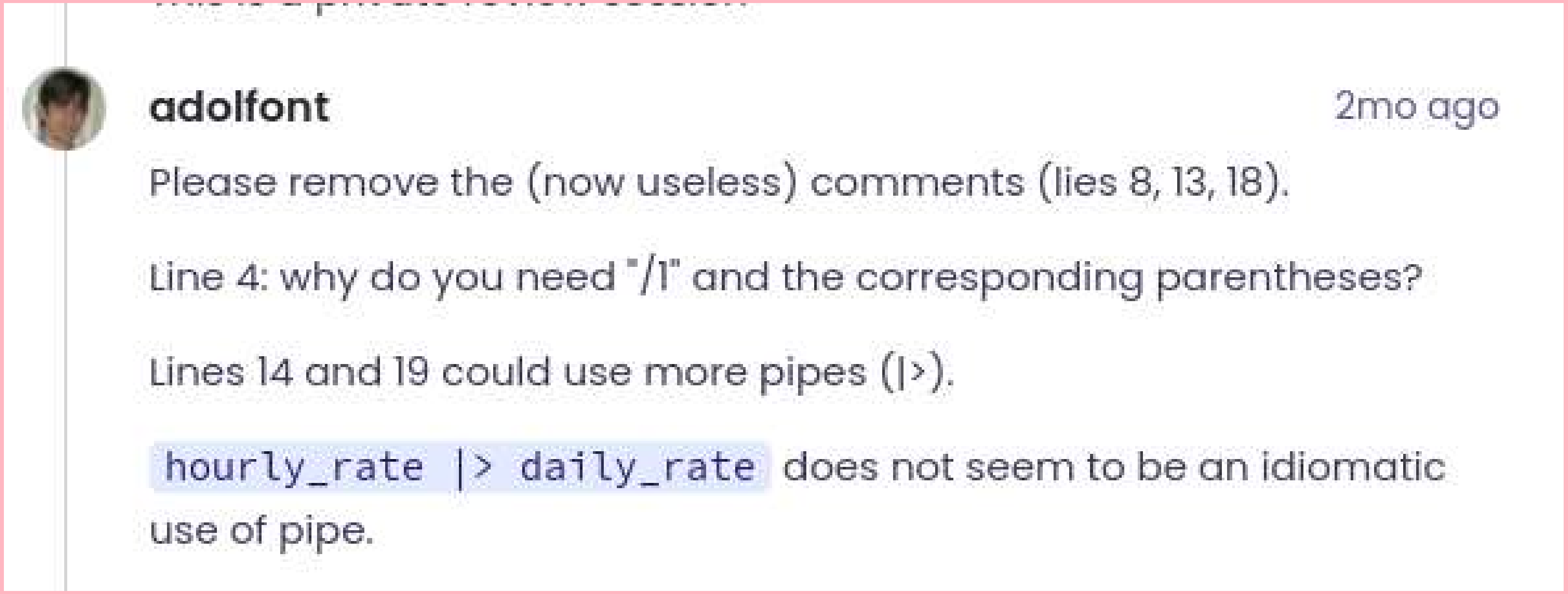
ok

Line 4: why do you need "/1" and the corresponding parentheses?

How can I change INT to FLOAT in Elixir?

Lines 14 and 19 could use more pipes (|>).

This discussion has ended. Have more to say? You can still post.



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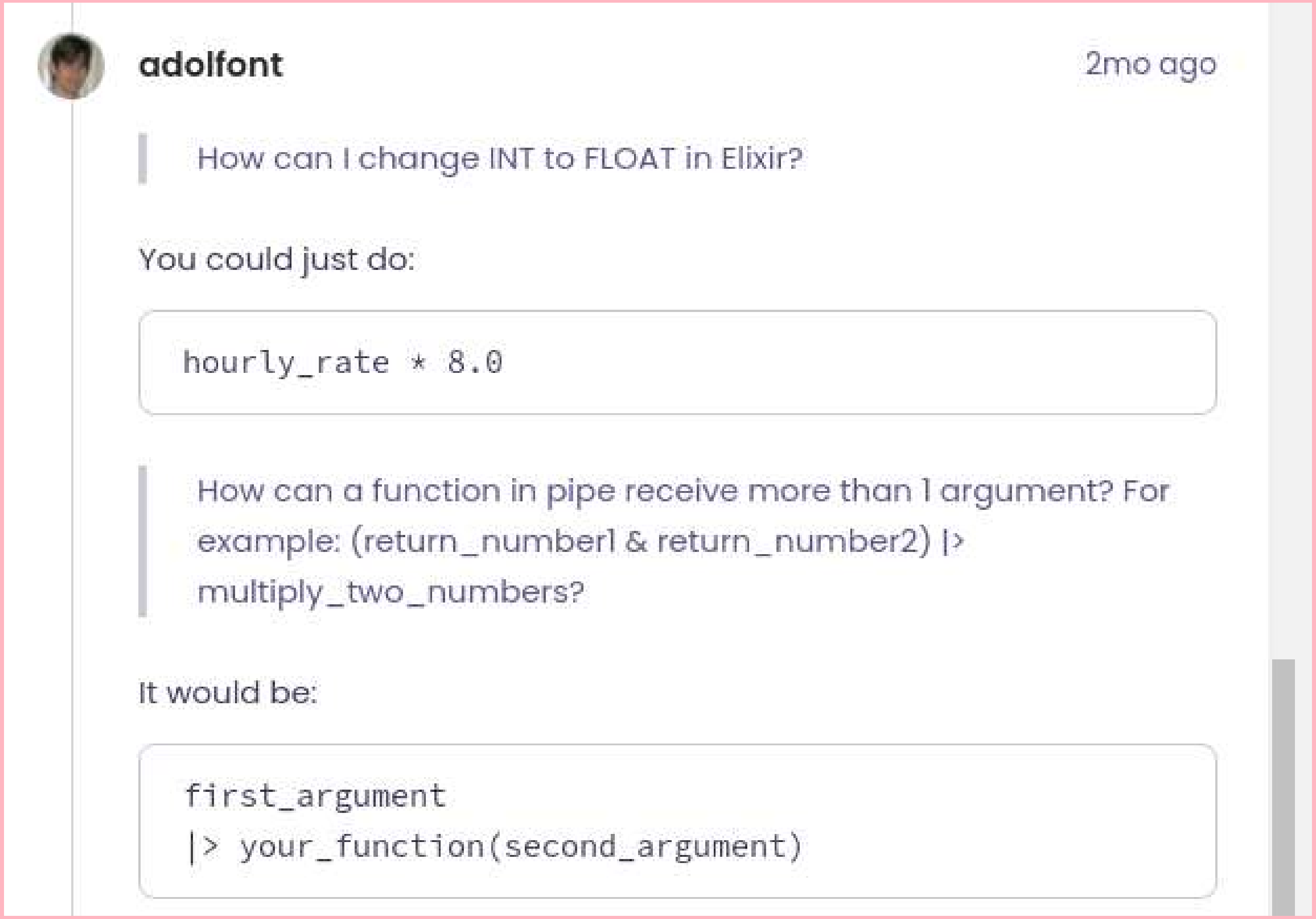


adolfont 2mo ago

> How can I change INT to FLOAT in Elixir?

You could just do:

```
hourly_rate * 8.0
```

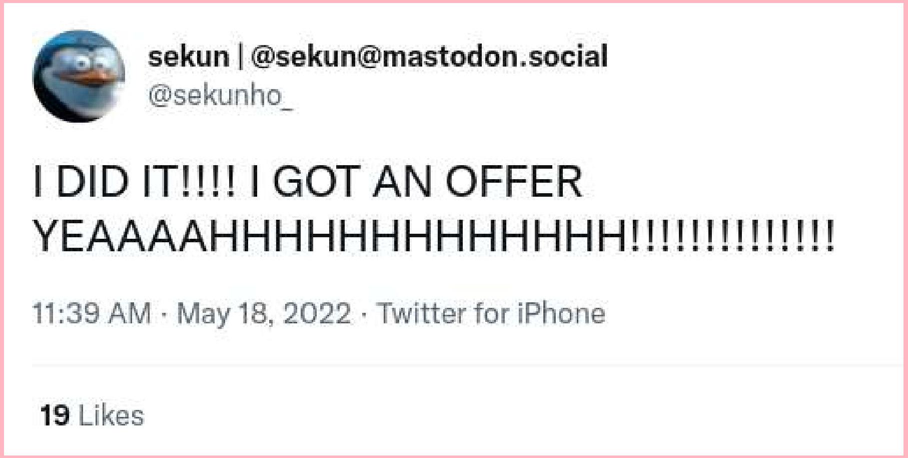
> How can a function in pipe receive more than 1 argument? For example: (return_number1 & return_number2) |> multiply_two_numbers?

It would be:

```
first_argument
|> your_function(second_argument)
```

José Valim and the Advent of Code

- José Valim's Twitch: 2018 and 2021
- Sekun's YouTube playlist with shorter, edited versions of Valim's videos
  - Support SEKUN



sekun | @sekun@mastodon.social
@sekunho_

I DID IT!!!! I GOT AN OFFER
YEAAAAHHHHHHHHHHHHH!!!!!!!!!!!!!!

11:39 AM · May 18, 2022 · Twitter for iPhone

19 Likes

Good/bad in AoC

- What's good about AoC?
  - Community (Twitter, Elixir Forum and Erlang Forums)
- What is "bad" in AoC?
  - Weekends! *But SpawnFest too :)*
  - December! *Spring/Summer in the Southern Hemisphere*
  - Some challenges require (a lot of) prior knowledge (programming competitions)
  - Is there a stimulus to write unreadable code?

Good/bad in Exercism

- What is good about Exercism?
  - mentoring
  - tests
  - automatic feedback
- What is "bad" in Exercism?
  - the tests are already there
    - It is impossible to do TDD
  - v3 kind of discourages mentoring (debatable)

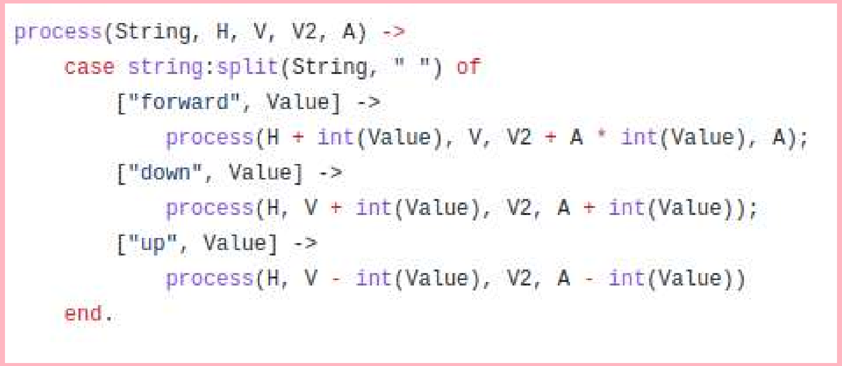
What have I learned? 1/3

- Use of Enum (Valim) #aoc #elixir
  - *There's an Enum function for that!*
- Lots of pipes!
- Functions with the same name but different arity, one being public and the other private #erlang #exercism
- Various uses of list comprehension:

```
[command(S) || S <- string:split(String, [$\n], all), S =/= ""].
```

What have I learned? 2/3

- case #erlang #aoc

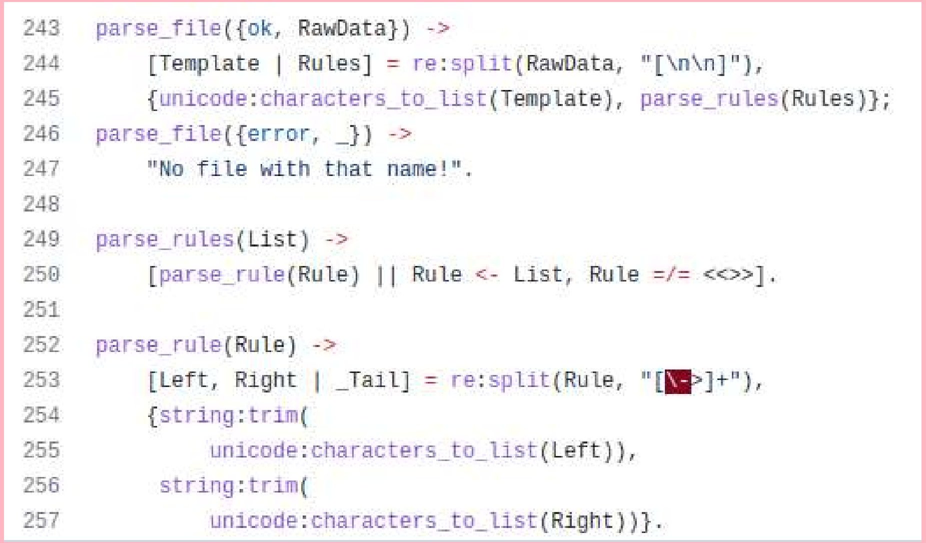


```
process(String, H, V, V2, A) ->
    case string:split(String, " ") of
        ["forward", Value] ->
            process(H + int(Value), V, V2 + A * int(Value), A);
        ["down", Value] ->
            process(H, V + int(Value), V2, A + int(Value));
        ["up", Value] ->
            process(H, V - int(Value), V2, A - int(Value))
    end.
```

- read, understand and run code from others #erlang #aoc

What have I learned? 2/3

- re:split



```erlang
parse_file({ok, RawData}) ->
    [Template | Rules] = re:split(RawData, "[\n\n]"),
    {unicode:characters_to_list(Template), parse_rules(Rules)};
parse_file({error, _}) ->
    "No file with that name!".

parse_rules(List) ->
    [parse_rule(Rule) || Rule <- List, Rule =/= <<>>].

parse_rule(Rule) ->
    [Left, Right | _Tail] = re:split(Rule, "[\->]+"),
    {string:trim(
         unicode:characters_to_list(Left)),
     string:trim(
         unicode:characters_to_list(Right))}.
```

How to use AoC to learn Erlang and/or Elixir?

- During December:
  - Set a time limit
  - Try to do both tasks for the day
  - If you can, read others' solutions (on Elixir Forum or Erlang Forums)
  - If not, then either give up or try to complete it another day

How to use Exercism to learn Erlang and/or Elixir?

- Join the two tracks
- Ask for mentorship whenever possible
    - You can do that with the link
- Look at other people's solutions
- Share your solution on the platform

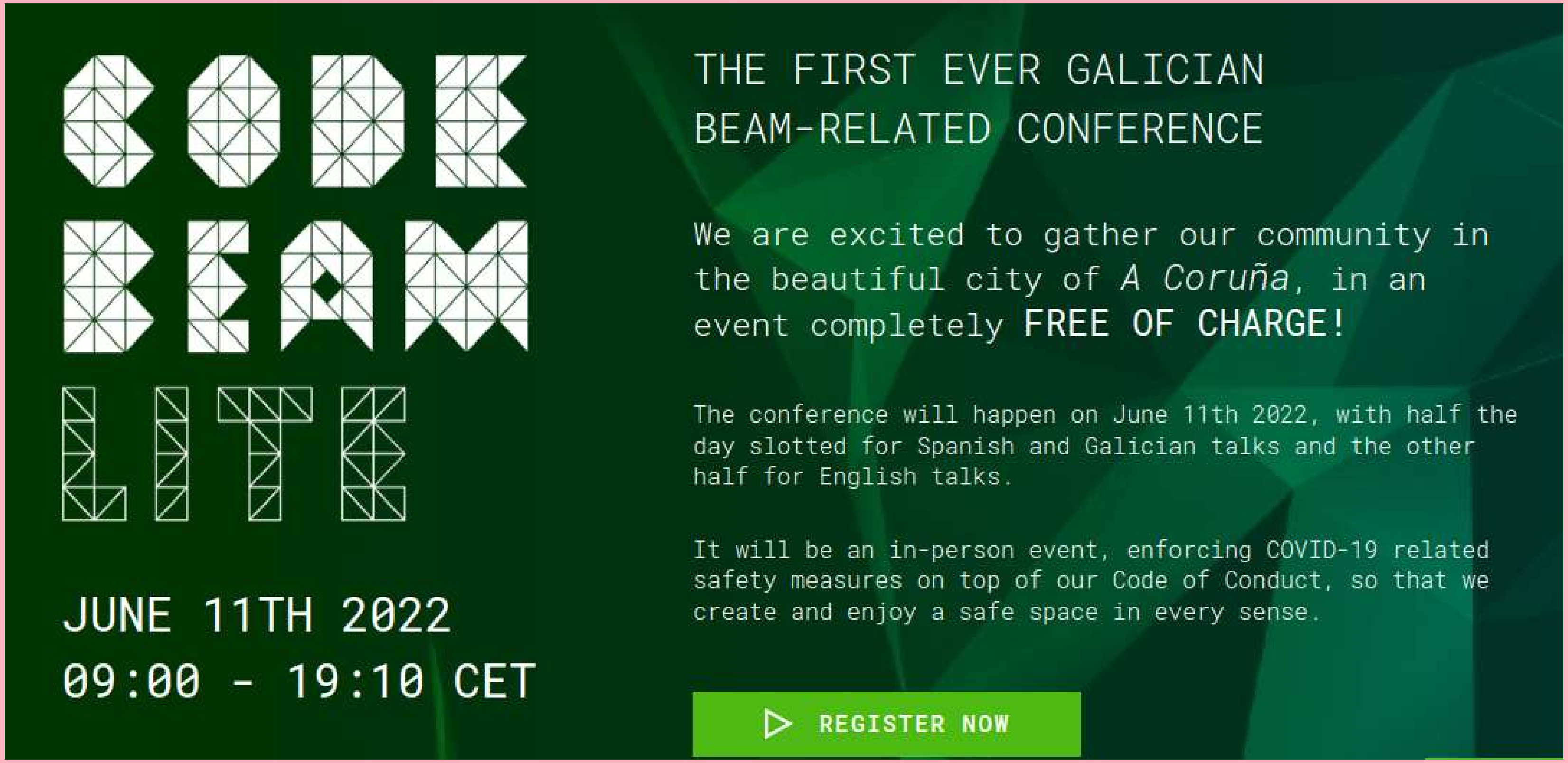
Final Tips

- "Sharpen the Saw" (Habit 7 - Sharpen the Saw)
- Exercise to stay in shape

Announcements

Code BEAM A Corunha

https://www.codebeamcorunha.es



JUNE 11TH 2022
09:00 - 19:10 CET

THE FIRST EVER GALICIAN BEAM-RELATED CONFERENCE

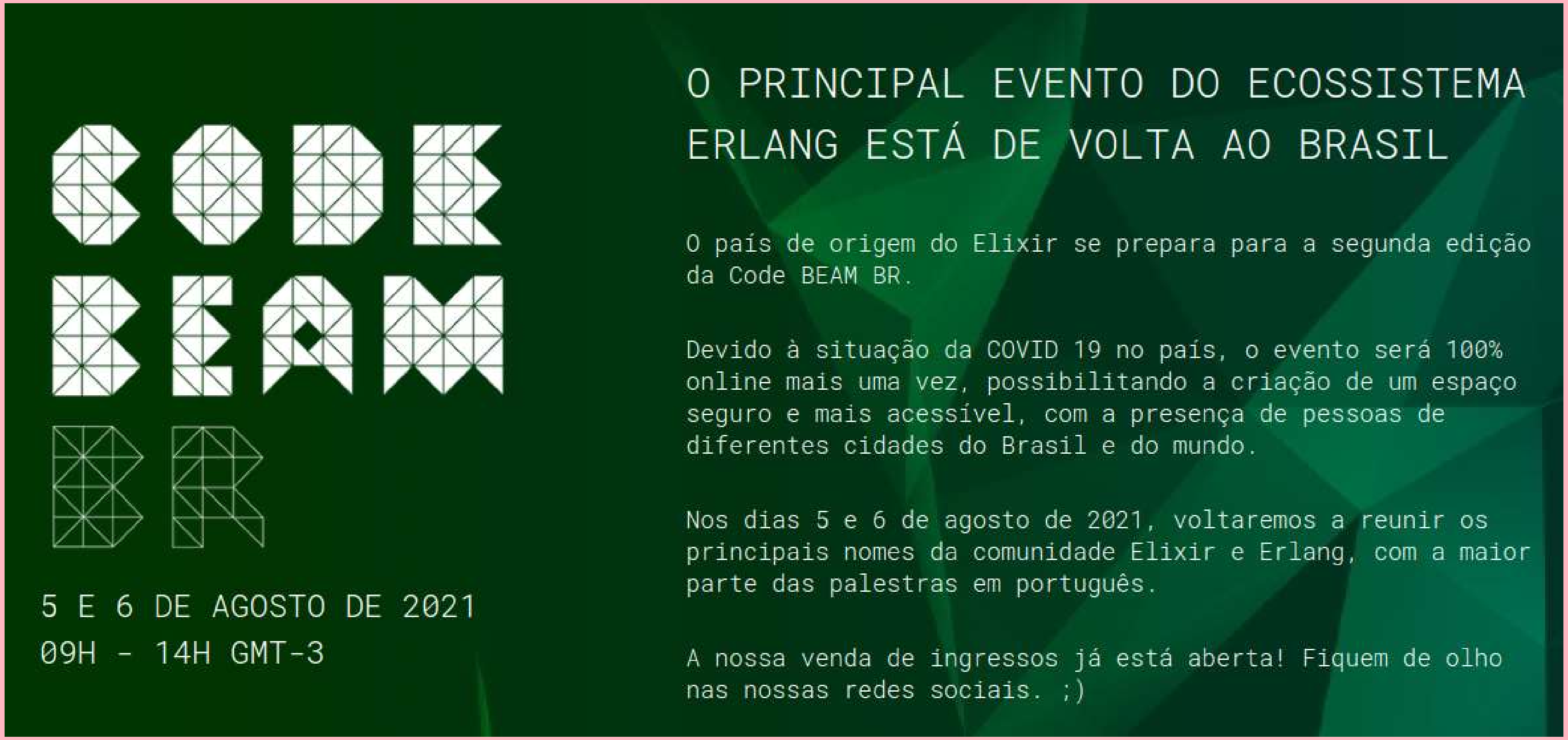
We are excited to gather our community in the beautiful city of *A Coruña*, in an event completely **FREE OF CHARGE!**

The conference will happen on June 11th 2022, with half the day slotted for Spanish and Galician talks and the other half for English talks.

It will be an in-person event, enforcing COVID-19 related safety measures on top of our Code of Conduct, so that we create and enjoy a safe space in every sense.

Code BEAM Brasil

https://www.codebeambr.com/



CODE BEAM BR

5 E 6 DE AGOSTO DE 2021
09H - 14H GMT-3

O PRINCIPAL EVENTO DO ECOSSISTEMA ERLANG ESTÁ DE VOLTA AO BRASIL

O país de origem do Elixir se prepara para a segunda edição da Code BEAM BR.

Devido à situação da COVID 19 no país, o evento será 100% online mais uma vez, possibilitando a criação de um espaço seguro e mais acessível, com a presença de pessoas de diferentes cidades do Brasil e do mundo.

Nos dias 5 e 6 de agosto de 2021, voltaremos a reunir os principais nomes da comunidade Elixir e Erlang, com a maior parte das palestras em português.

A nossa venda de ingressos já está aberta! Fiquem de olho nas nossas redes sociais. ;)

Elixir Brasil

https://elixirbrasil.com/

10 Years of Elixir

You can watch the recording!

https://bit.ly/10YearsOfElixir

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adolfont.github.io

Slides