

#IFREAK / 28.10.2022

Was Kubernetes- Ingress-Regeln mit der Chomsky- Hierarchie zu tun haben

INOQ



LARS HUPEL

@LARSR_H



Lars Hupel

@larsr_h



Does any conference want "Chomsky hierarchy in action: FizzBuzz in Kubernetes" as a talk?



Lars Hupel @larsr_h · Jan 9, 2021

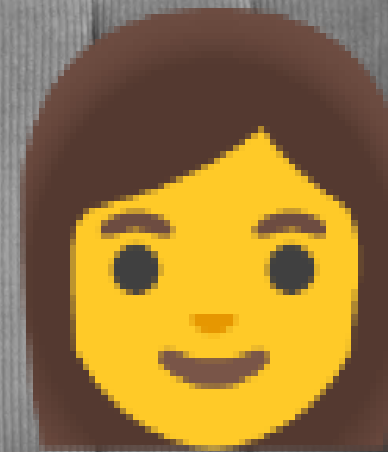
update: I have implemented FizzBuzz as a set of k8s ingress rules

[Show this thread](#)

7:20 PM · Jan 11, 2021 · Twitter Web App

Was ist FizzBuzz?

**Du kennst FizzBuzz
nicht?**





1

2

Fizz

4

Buzz

Fizz

7

8

Fizz

Buzz

11

Fizz

13

14

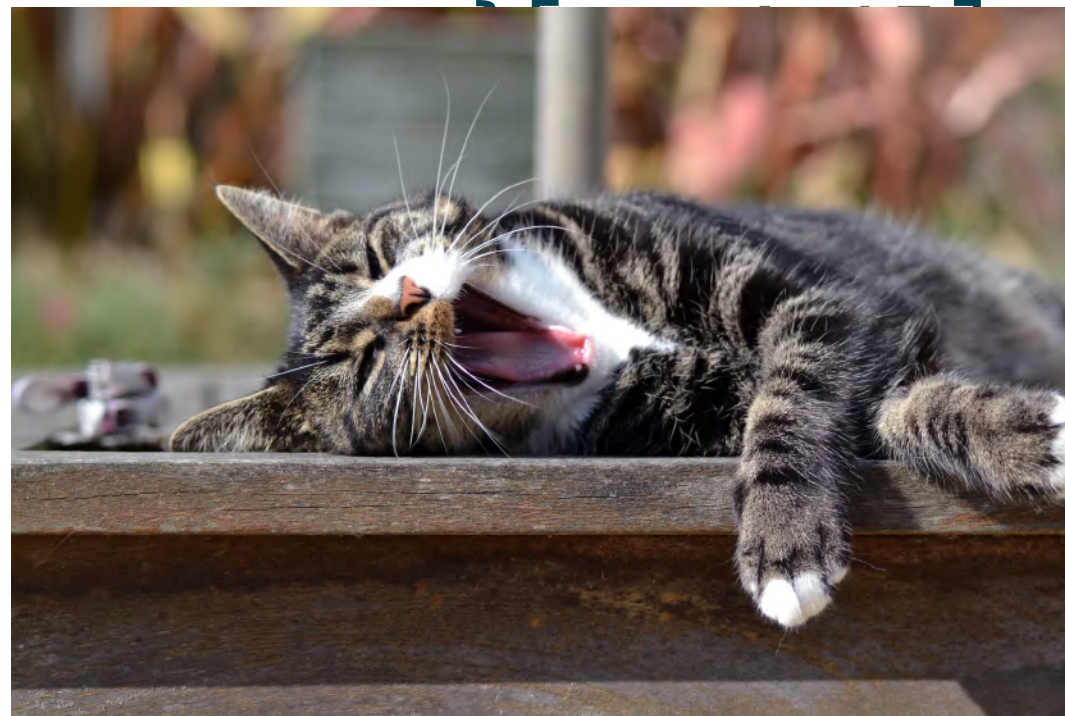
Fizzbuzz

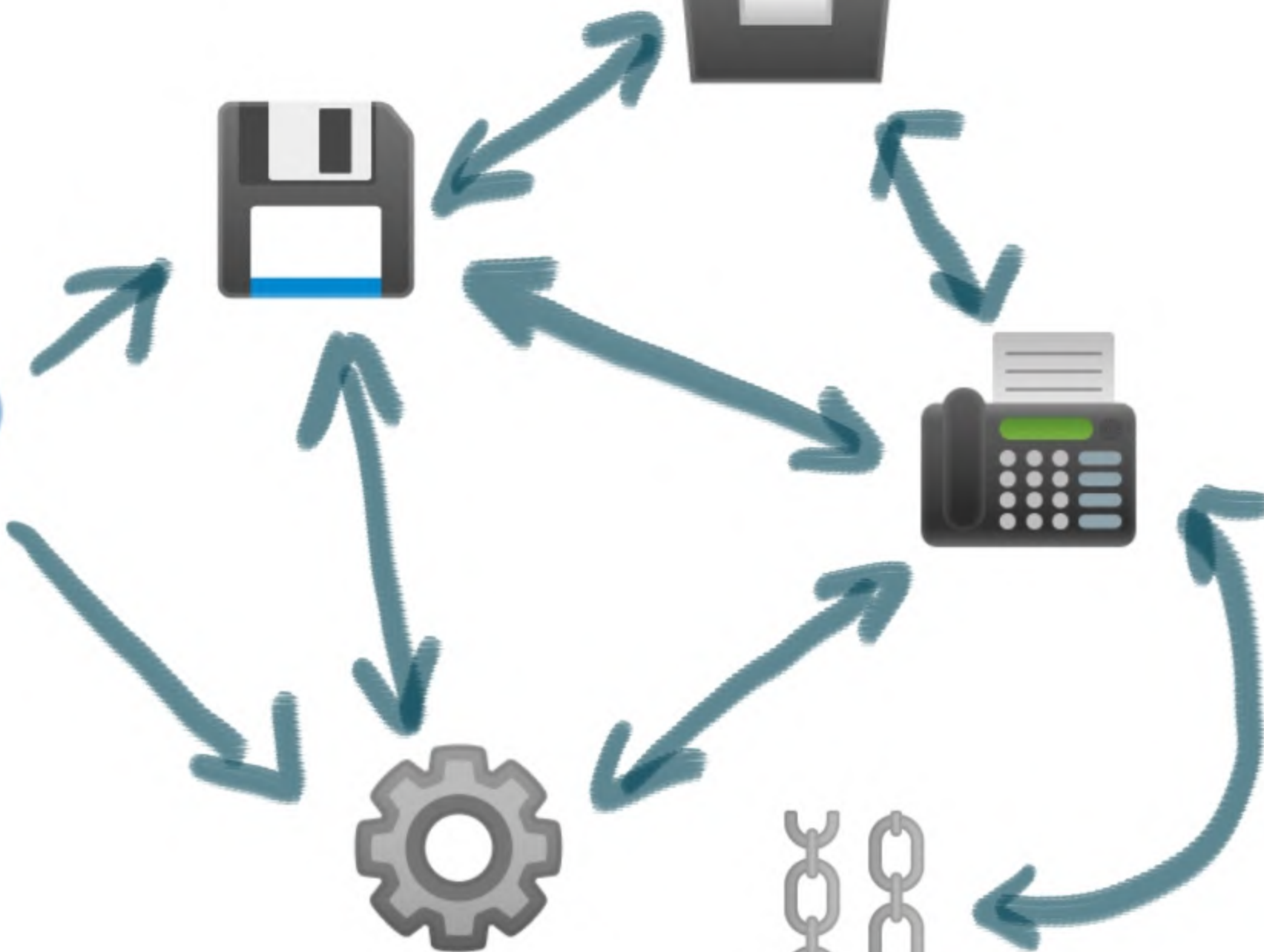
...

```
def buzzer(n):  
    return {  
        1: n,  
        6: "Fizz",  
        10: "Buzz",  
        0: "FizzBuzz"  
    }[n**4%15]  
  
for n in range(15):  
    print(buzzer(n + 1))
```



```
def buzzer(n):  
    return {  
        1: n,  
        6: "Fizz",  
        10: "Buzz",  
        0: "FizzBuzz"  
    }  
  
def fizzbuzz(n):  
    return buzzer(n + 1)
```







aws





Enterprise™ FizzBuzz requirements

Cloud Native

Web Scale

Low Code



$n \% 15 == 0$



?



Handwritten notes and equations covering various topics including physics, mathematics, and biology. Key sections include:

- Top Left:** Mathematical expressions like $11 \times 22 + 87$, $\langle \hat{a}^\dagger x \rangle$, and $14261(135 - n)8$.
- Top Center:** Equations such as $2 + 2 = 5 = \pi$, $2/224(\frac{n}{2})^8/10(\sqrt{95})$, and $2/46$.
- Top Right:** Physics formulas including $T = 2\pi\sqrt{\frac{L}{g}}$ (simple pend), $T = 2\pi\sqrt{\frac{I}{mgh}}$ (physical pend), and wave equations like $y(x,t) = y_m \sin(kx - \omega t)$.
- Middle Left:** Calculations involving $(\frac{1}{2} + \frac{1}{92}) \frac{22}{203} \{ \frac{4^\circ}{87} \}$ and $\frac{1}{125} (\frac{65}{227}) \frac{68}{713} = 4$.
- Middle Center:** Equations like $\frac{45}{95^\circ} \sqrt{9500(4) + (\frac{9}{10})} = (\sqrt{9361}(-\frac{2}{8}))$ and $\frac{45}{100}(\frac{4}{3}) + \sqrt{95619}$.
- Middle Right:** Interference formulas: $\frac{\Delta L}{\lambda} = 0.5, 1.5, 2.5$ (fully destructive) and $\frac{\Delta L}{\lambda} = 0, 1, 2$ (fully constructive).
- Bottom Left:** A diagram of a triangle with vertices labeled $\theta_m + \theta_{m+1}$, $\theta_m + 2\theta$, and θ_m . Below it is the equation $\Delta p_x = p \sin \varphi = \frac{h}{\lambda} \sin \varphi$.
- Bottom Center:** The Schrödinger equation $\hat{H}\psi = E\psi$ and the probability density $W = \int |\psi|^2 dv$.
- Bottom Right:** Thermodynamic formulas including $Q = nC_p \Delta T$ (constant pressure) and $Q = nC_v \Delta T$ (constant volume).

**Hören Sie
mir mal zu,
dann können
Sie nämlich
noch was
lernen.**



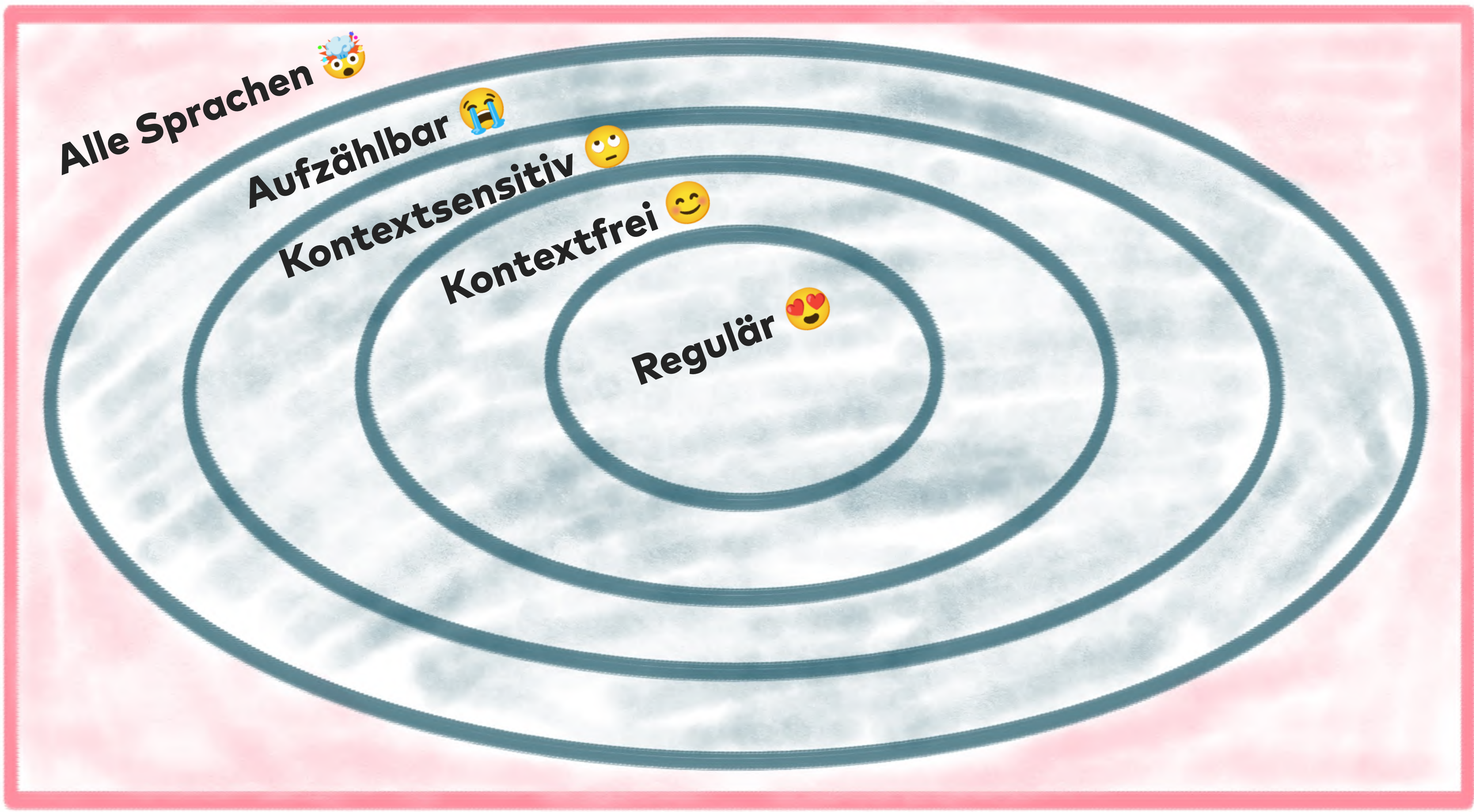
**Wat is eine
Sprache?
Da stellen
mer uns ma
janz domm.**



abc







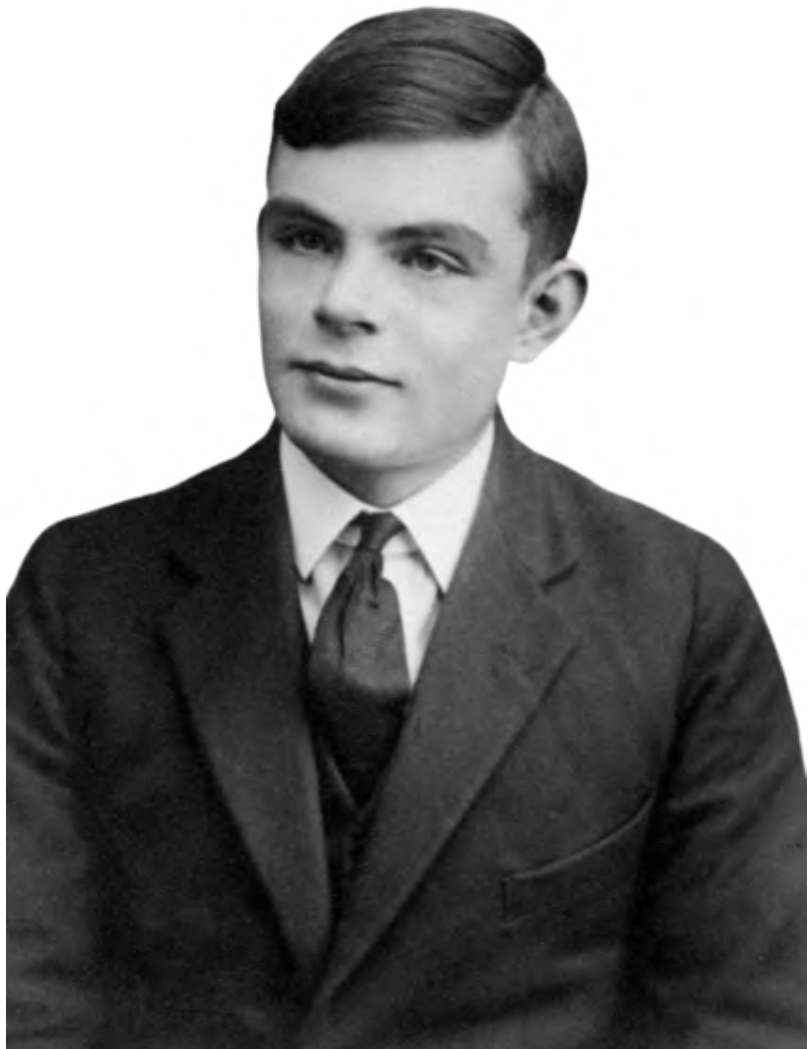
Alle Sprachen 🤯

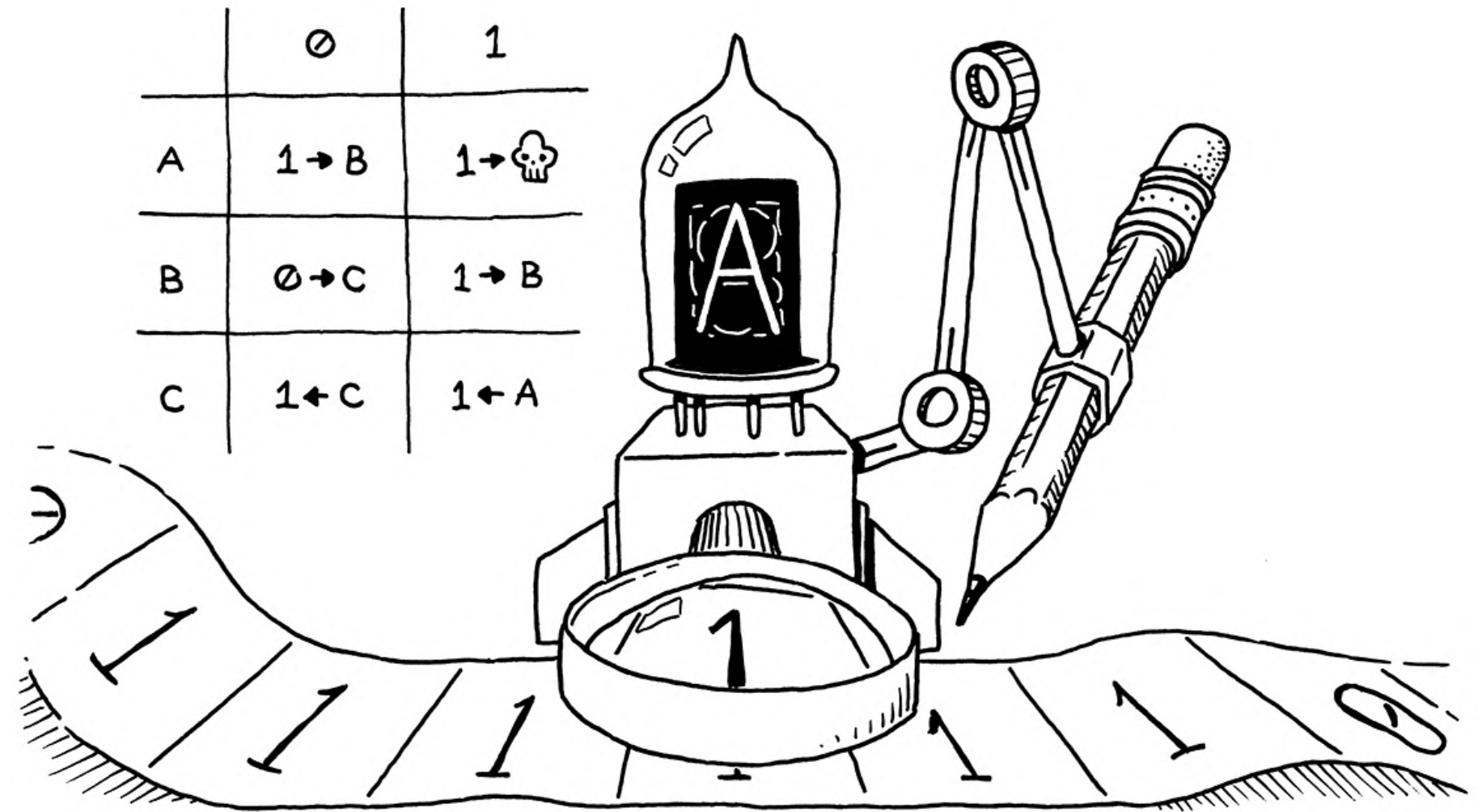
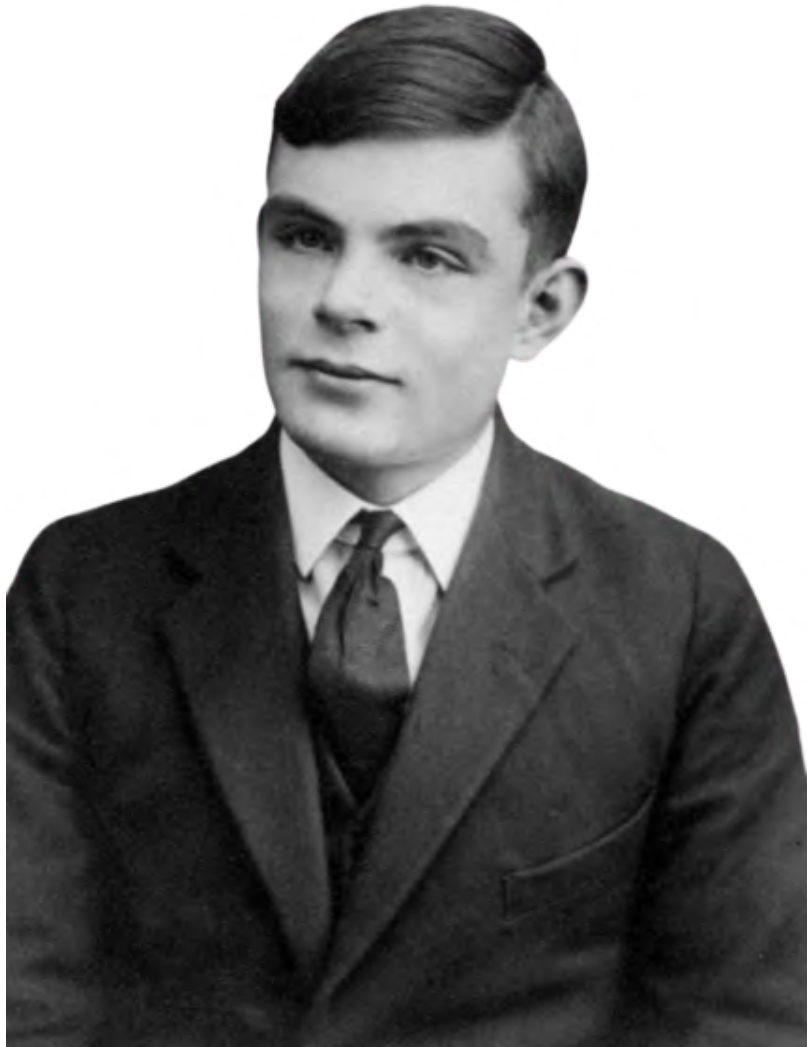
Aufzählbar 😭

Kontextsensitiv 😬

Kontextfrei 😊

Regulär 😍





Klasse	Modell	Laufzeit	Beispiel
Unentscheidbar	✗	✗	☐
Entscheidbar	TM	?	Post
Kontextsensitiv			
Kontextfrei			
Regulär			

~~Alle Sprachen~~ 🤯

~~Aufzählbar~~ 😭

Kontextsensitiv 🤔

Kontextfrei 😊

Regulär 😍

100%

ONE HUNDRED PERCENT
COMPREHENSIVE
AUTHORITATIVE
WHAT YOU NEED
ONE HUNDRED PERCENT

Create exciting,
dynamic Web sites
without becoming
a programmer

Focus on technologies
you will use most, such
as schemas, XHTML,
SVG, and RDDL

Build your knowledge
of the leading data
format technology
for the Web



XML 1.1

Bible

3rd Edition

Elliotte Rusty Harold

COMPANION
WEB SITE

Features code examples,
XML 1.1 specification, valuable
information from previous editions,
and useful XML reference material

Klasse	Modell	Laufzeit	Beispiel
Unentscheidbar	✗	✗	
Entscheidbar	TM	?	Post
Kontextsensitiv	LBA	?	XML
Kontextfrei			
Regulär			

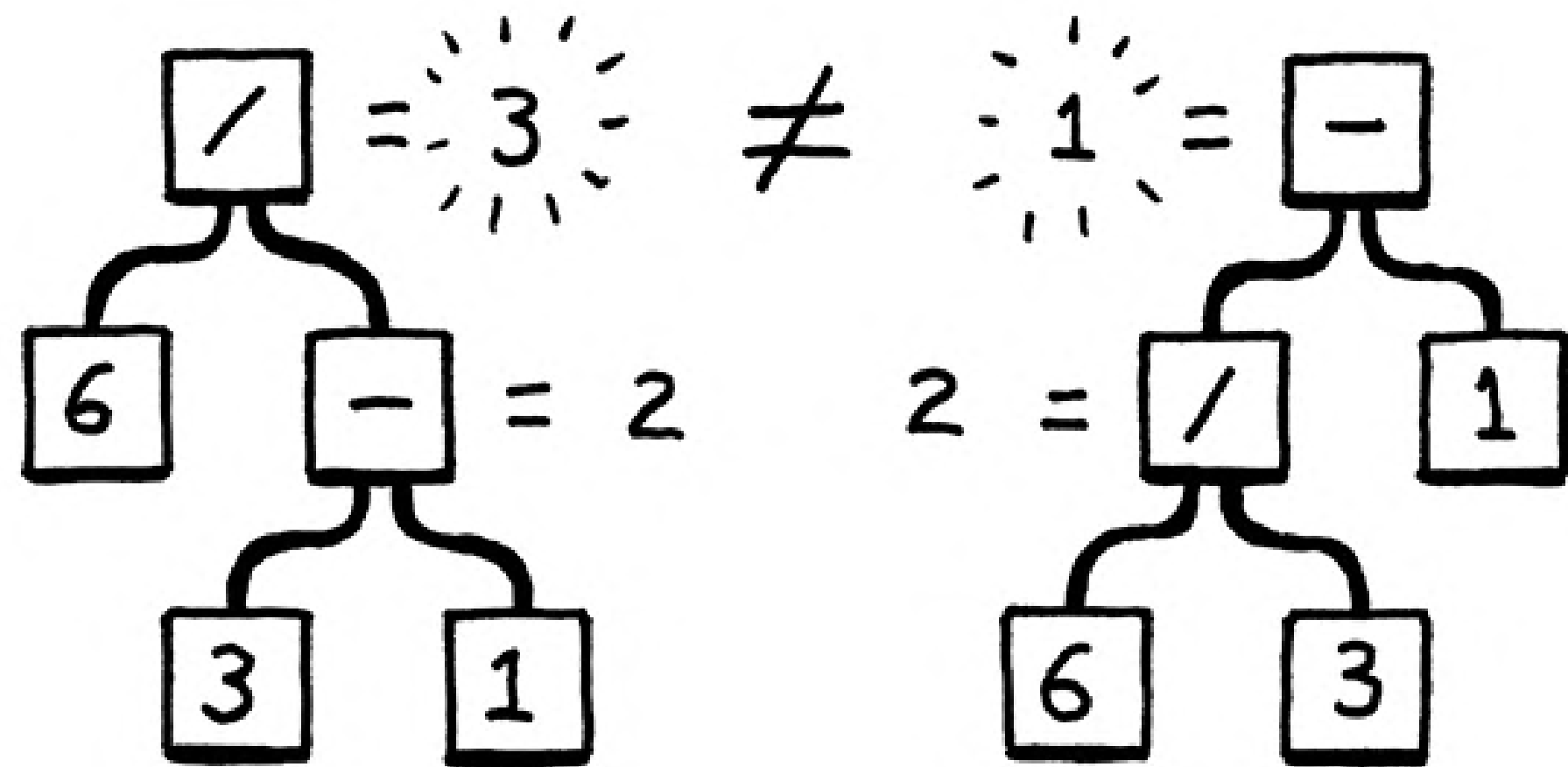
~~Alle Sprachen 🤯~~

~~Aufzählbar 😭~~

~~Kontextsensitiv 🤔~~

Kontextfrei 😊

Regulär 🥰





Klasse	Modell	Laufzeit	Beispiel
Unentscheidbar	✗	✗	☐
Entscheidbar	TM	?	Post
Kontextsensitiv	LBA	?	XML
Kontextfrei	PDA/CFG	$O(n^3)$	arith. Ausdrücke
Regulär			

~~Alle Sprachen~~ 🤯

~~Aufzählbar~~ 😭

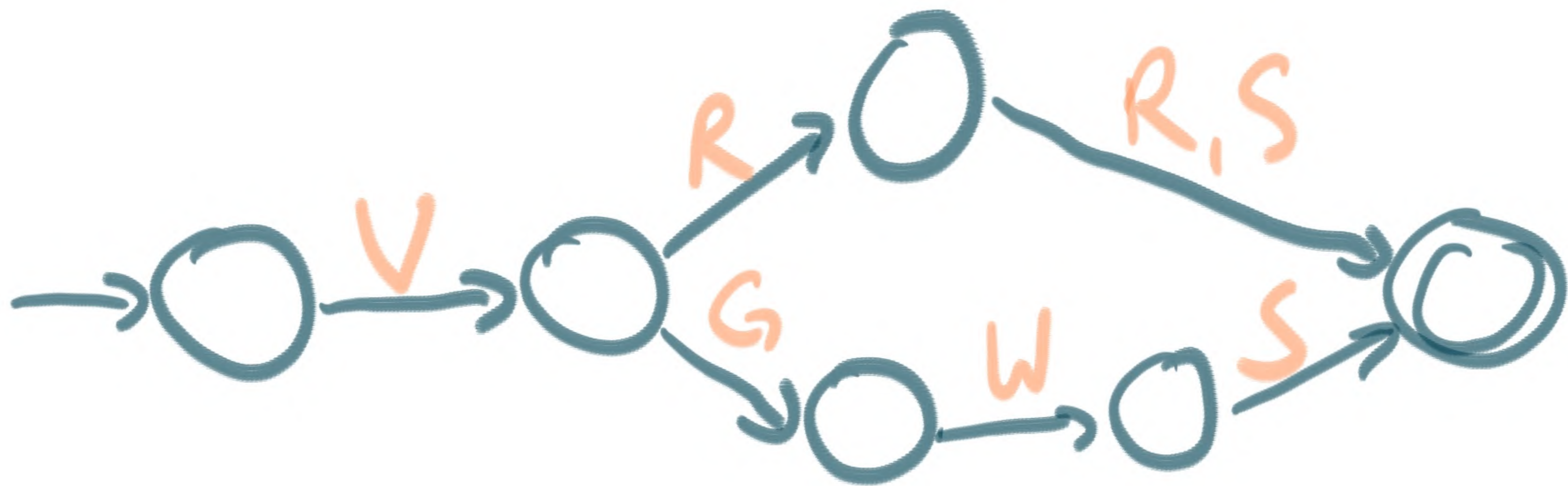
~~Kontextsensitiv~~ 😬

~~Kontextfrei~~ 😊

Regulär 🥰



Endlich reguläre Leute.



Klasse	Modell	Laufzeit	Beispiel
Unentscheidbar	✗	✗	☐
Entscheidbar	TM	?	Post
Kontextsensitiv	LBA	?	XML
Kontextfrei	PDA/CFG	$\mathcal{O}(n^3)$	arith. Ausdrücke
Regulär	DFA/RE	$\mathcal{O}(n)$	Lexer



$$\begin{aligned} 124 &= 1 \cdot 100 \\ &\quad + 2 \cdot 10 \\ &\quad + 4 \cdot 1 \end{aligned}$$

$$124 \bmod 3 = 1$$

$$12 \bmod 3$$

$$12 \bmod 3$$

$$= (1 \cdot 10 + 2) \bmod 3$$

$$12 \bmod 3$$

$$= (1 \cdot 10 + 2) \bmod 3$$

$$= ((1 \bmod 3) \cdot 10 \bmod 3 \\ + 2 \bmod 3) \bmod 3$$

$$12 \bmod 3$$

$$= (1 \cdot 10 + 2) \bmod 3$$

$$= ((1 \bmod 3) \cdot 10 \bmod 3$$

$$+ 2 \bmod 3) \bmod 3$$

$$= 0$$

$$124 \bmod 3$$

$$124 \bmod 3$$

$$= (12 \cdot 10 + 4) \bmod 3$$

$$124 \bmod 3$$

$$= (12 \cdot 10 + 4) \bmod 3$$

$$= ((12 \bmod 3) \cdot 10 \bmod 3 \\ + 4 \bmod 3) \bmod 3$$

$$124 \bmod 3$$

$$= (12 \cdot 10 + 4) \bmod 3$$

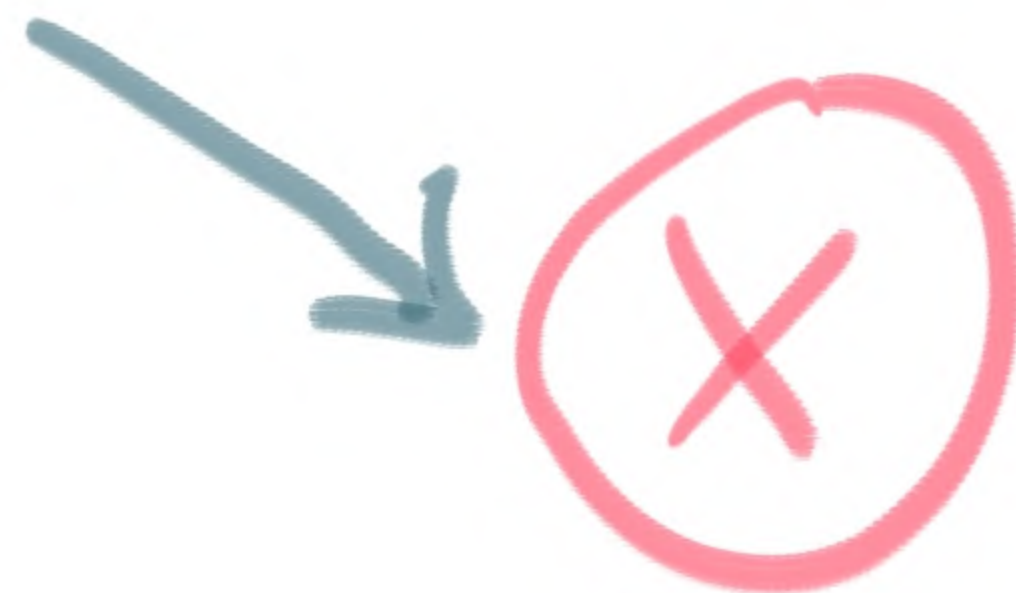
$$= ((12 \bmod 3) \cdot 10 \bmod 3 \\ + 4 \bmod 3) \bmod 3$$

$$= 1$$

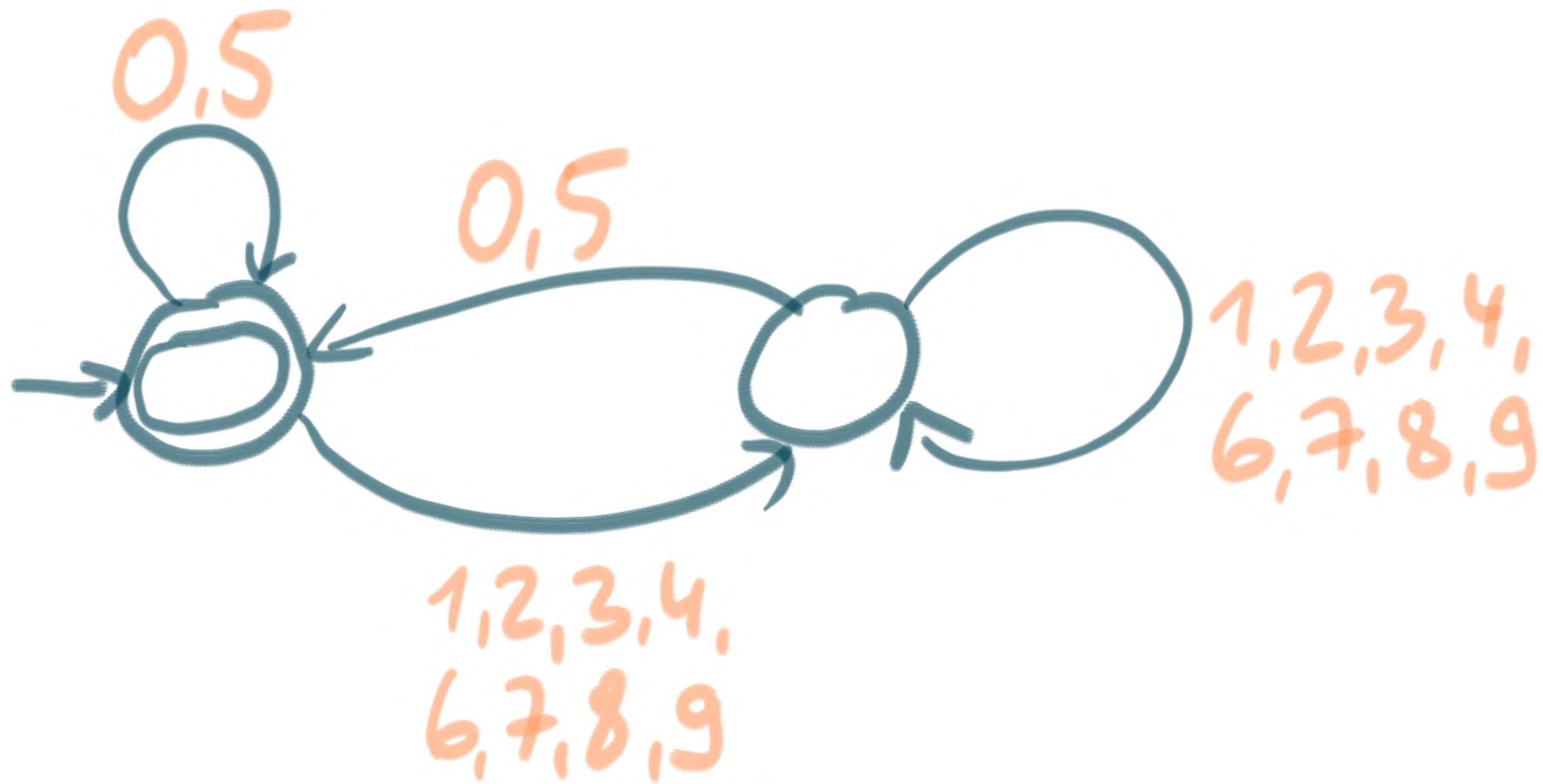
157...



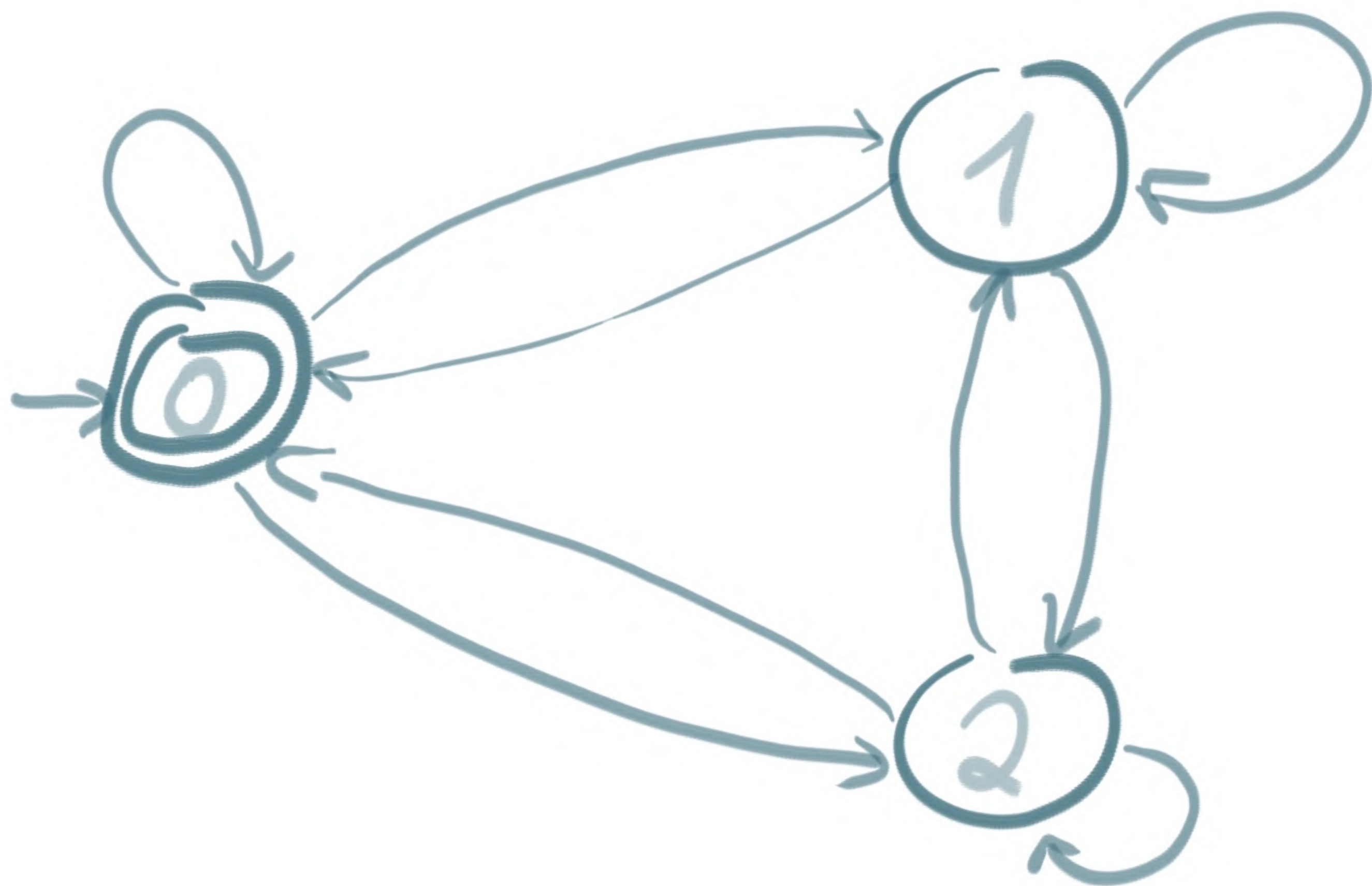
$x \bmod k$
 $= 0?$

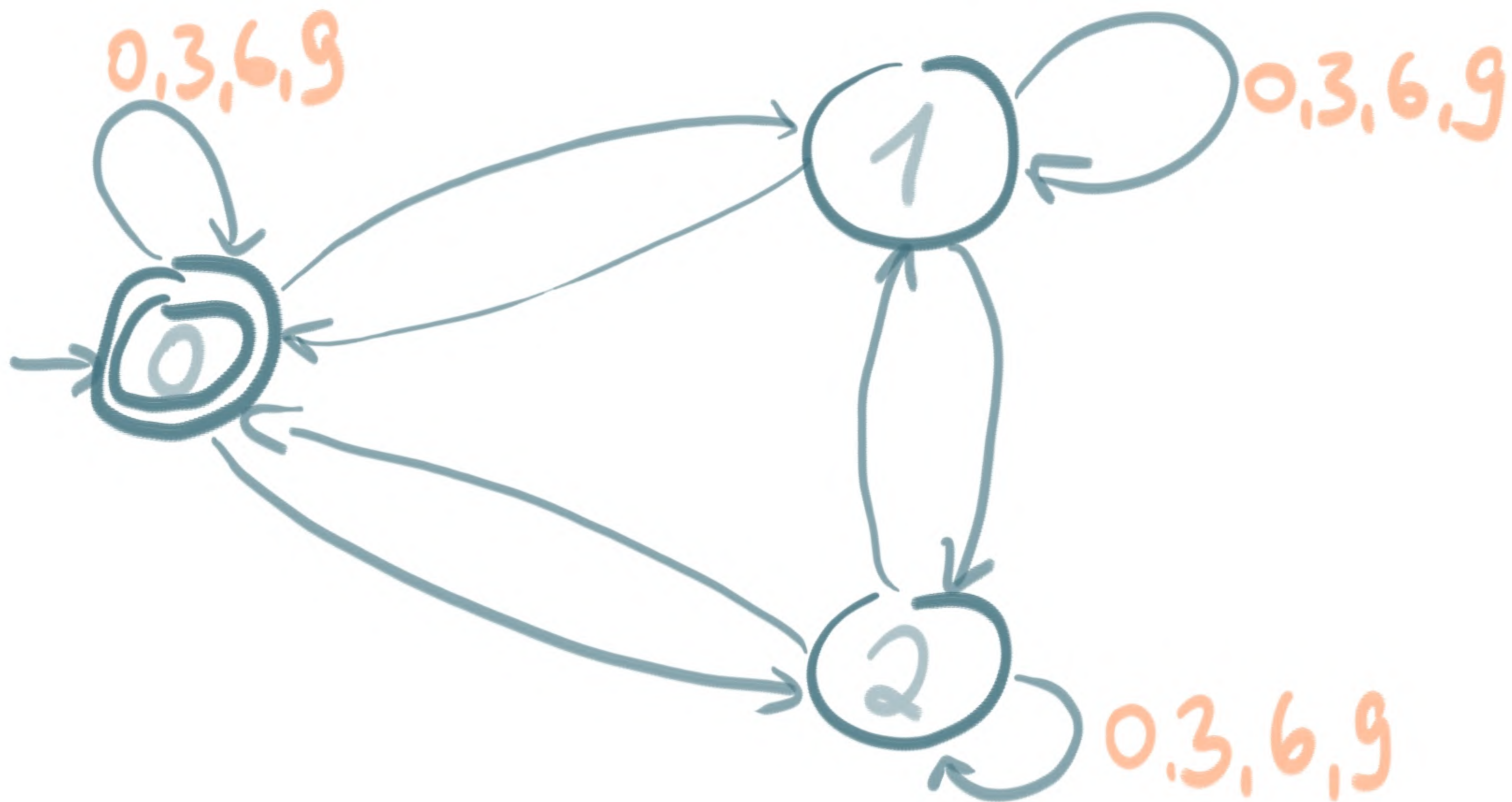


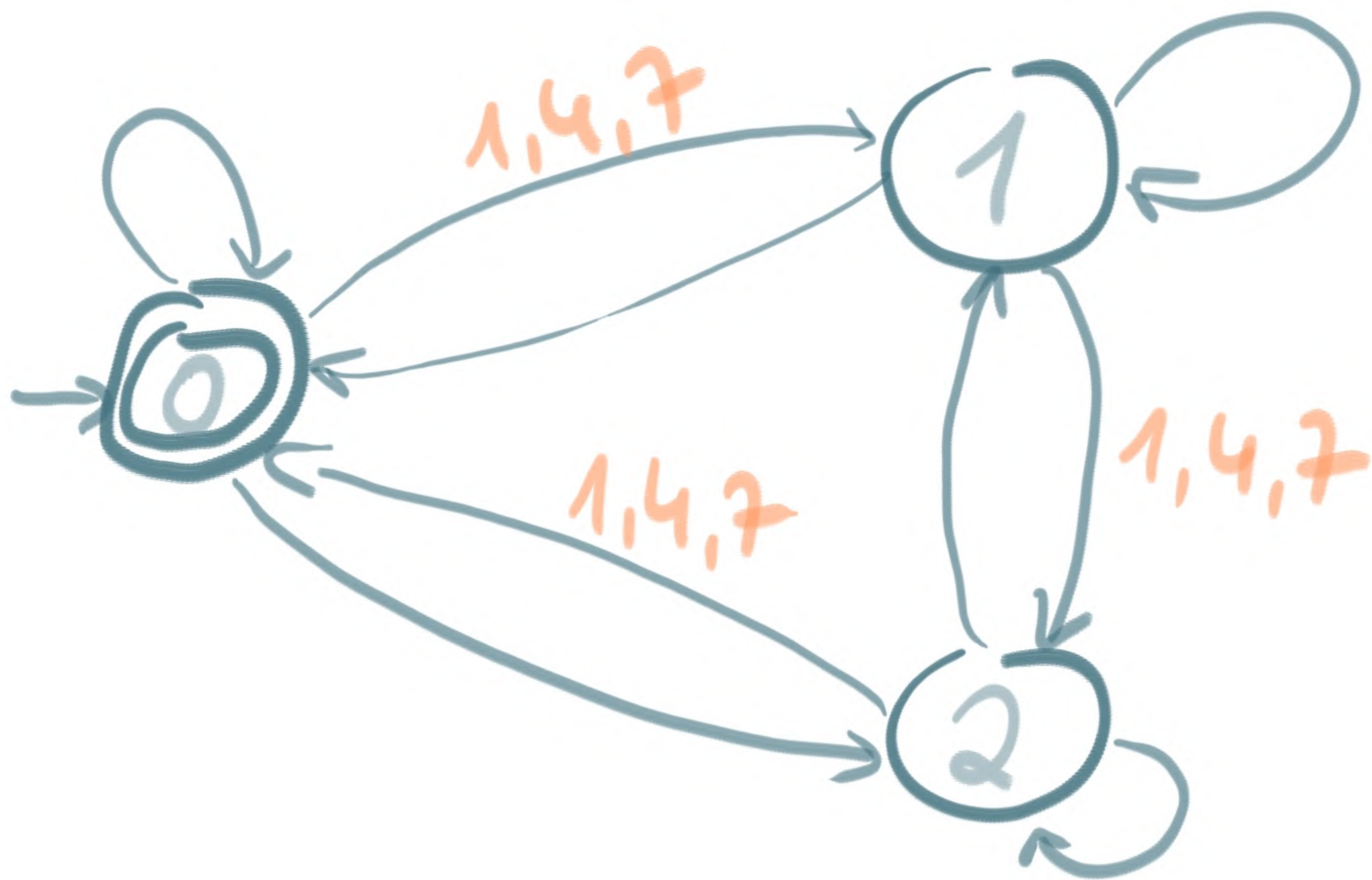


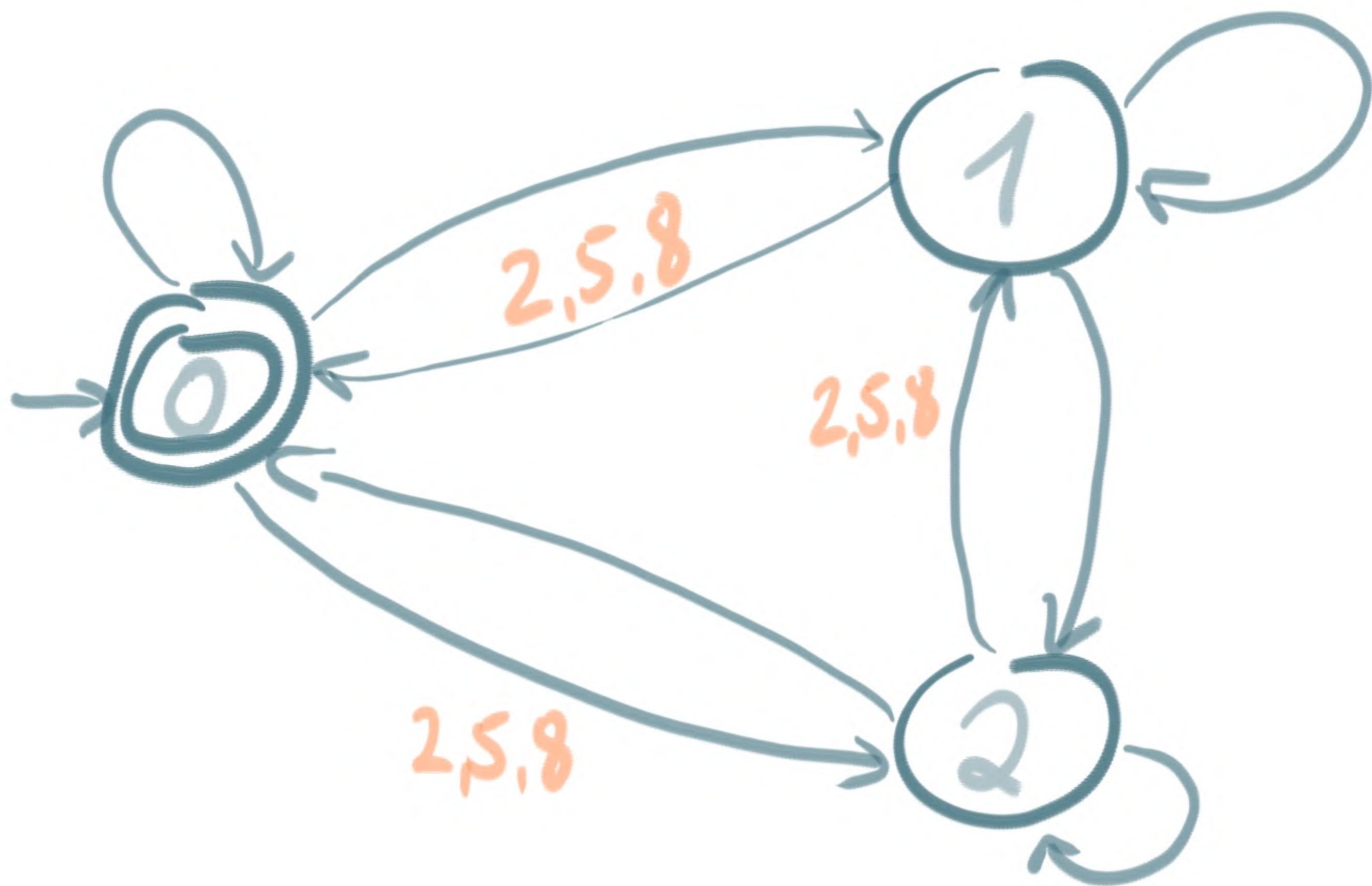


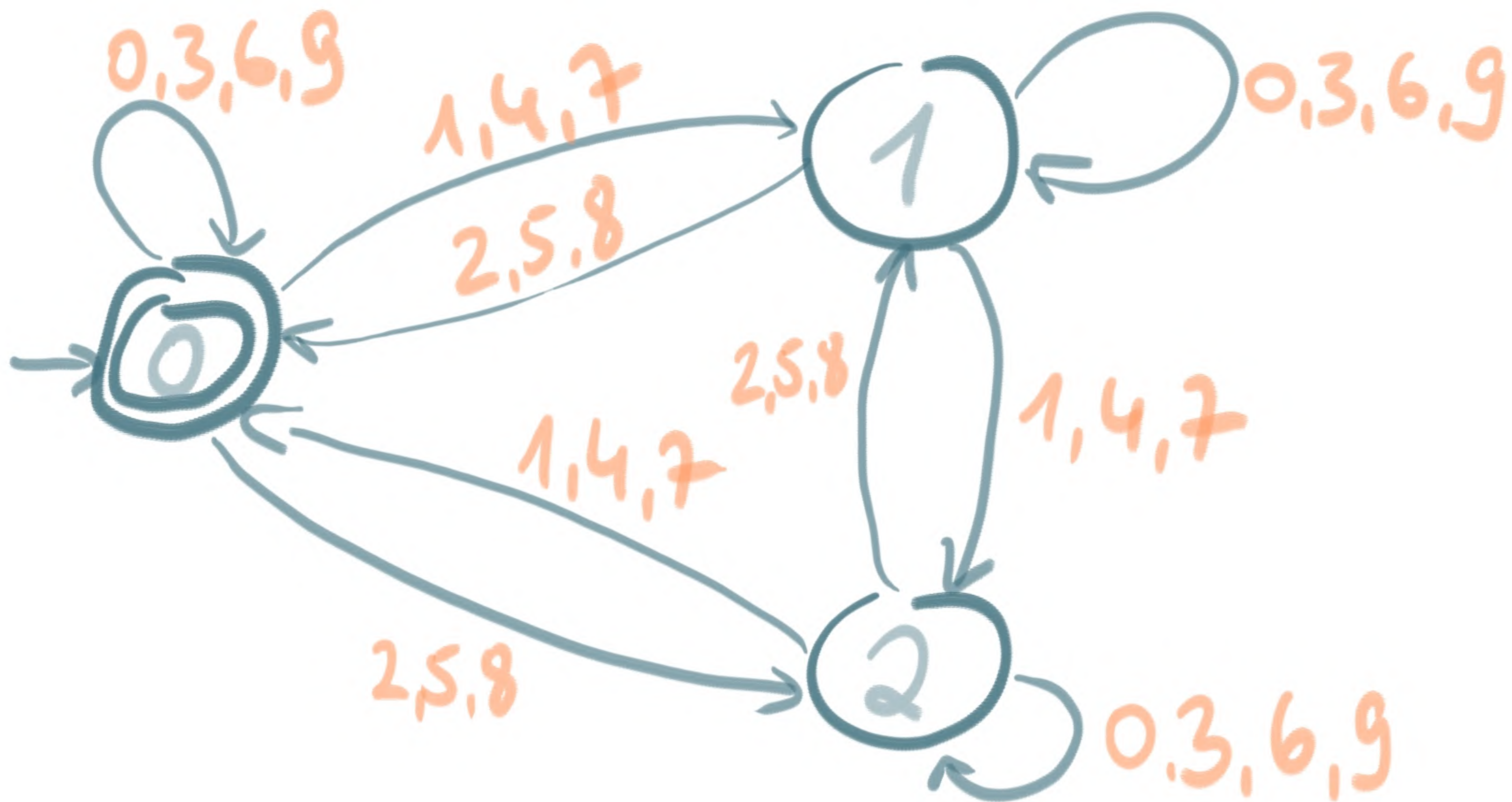


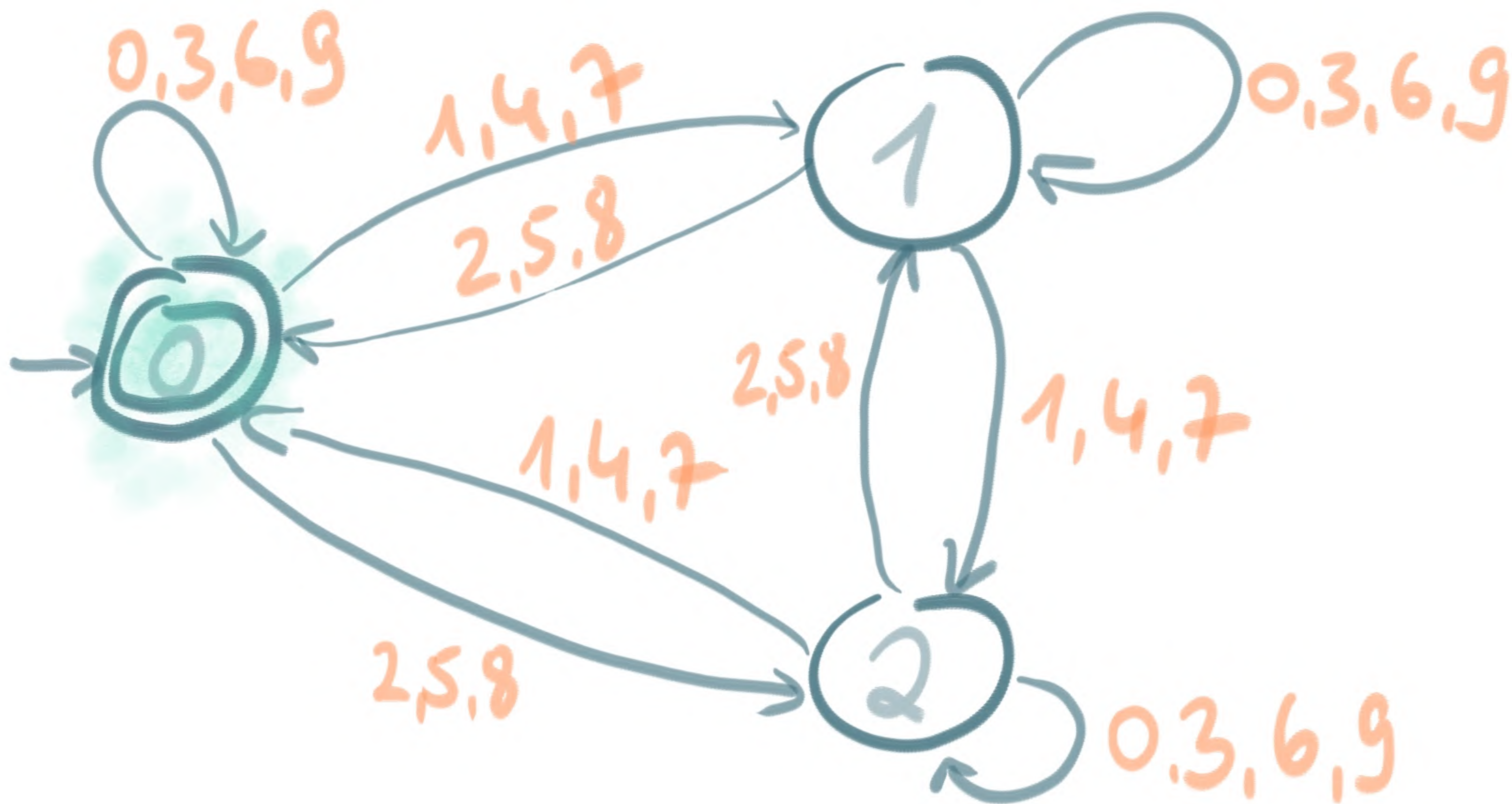


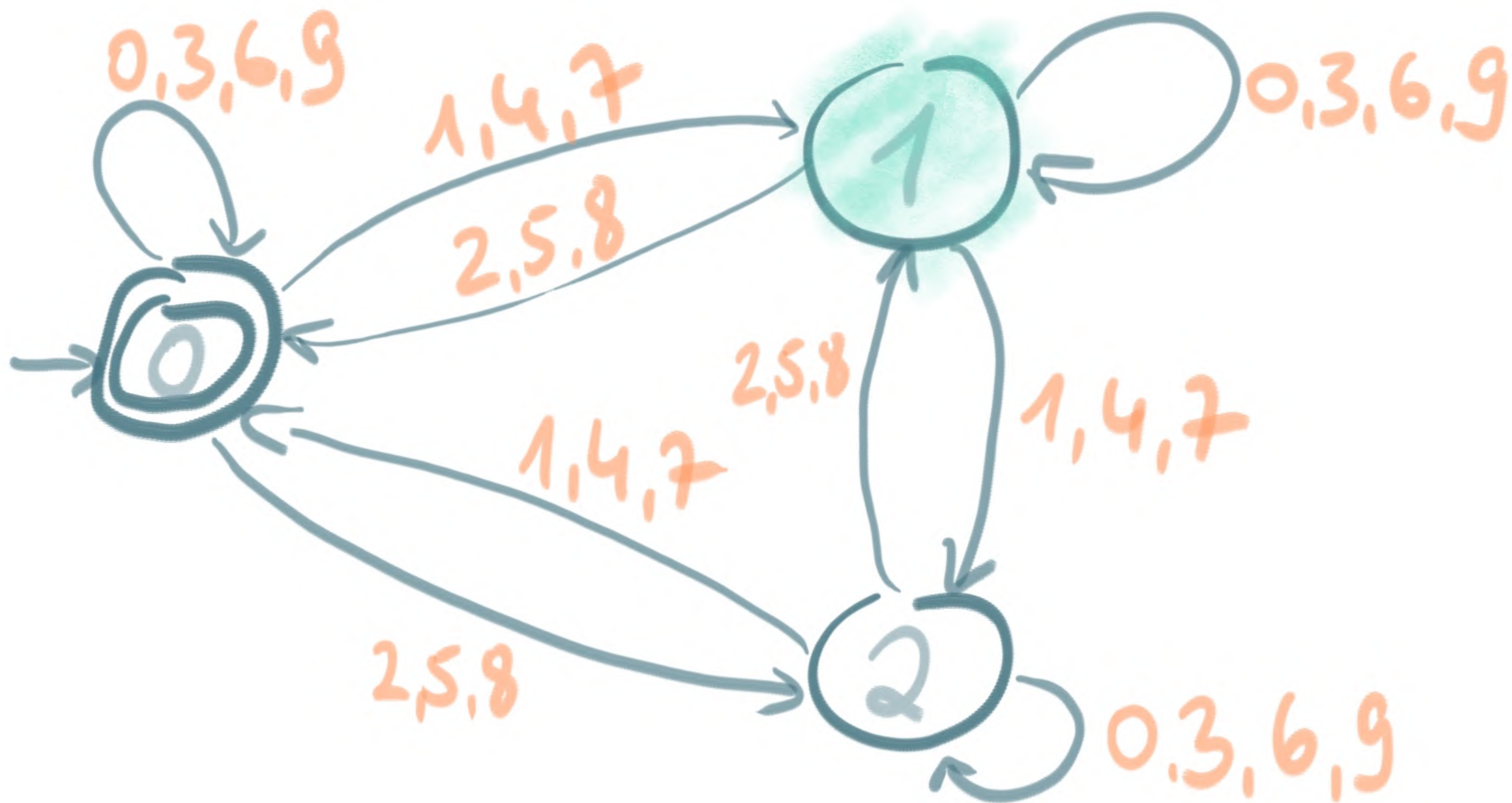


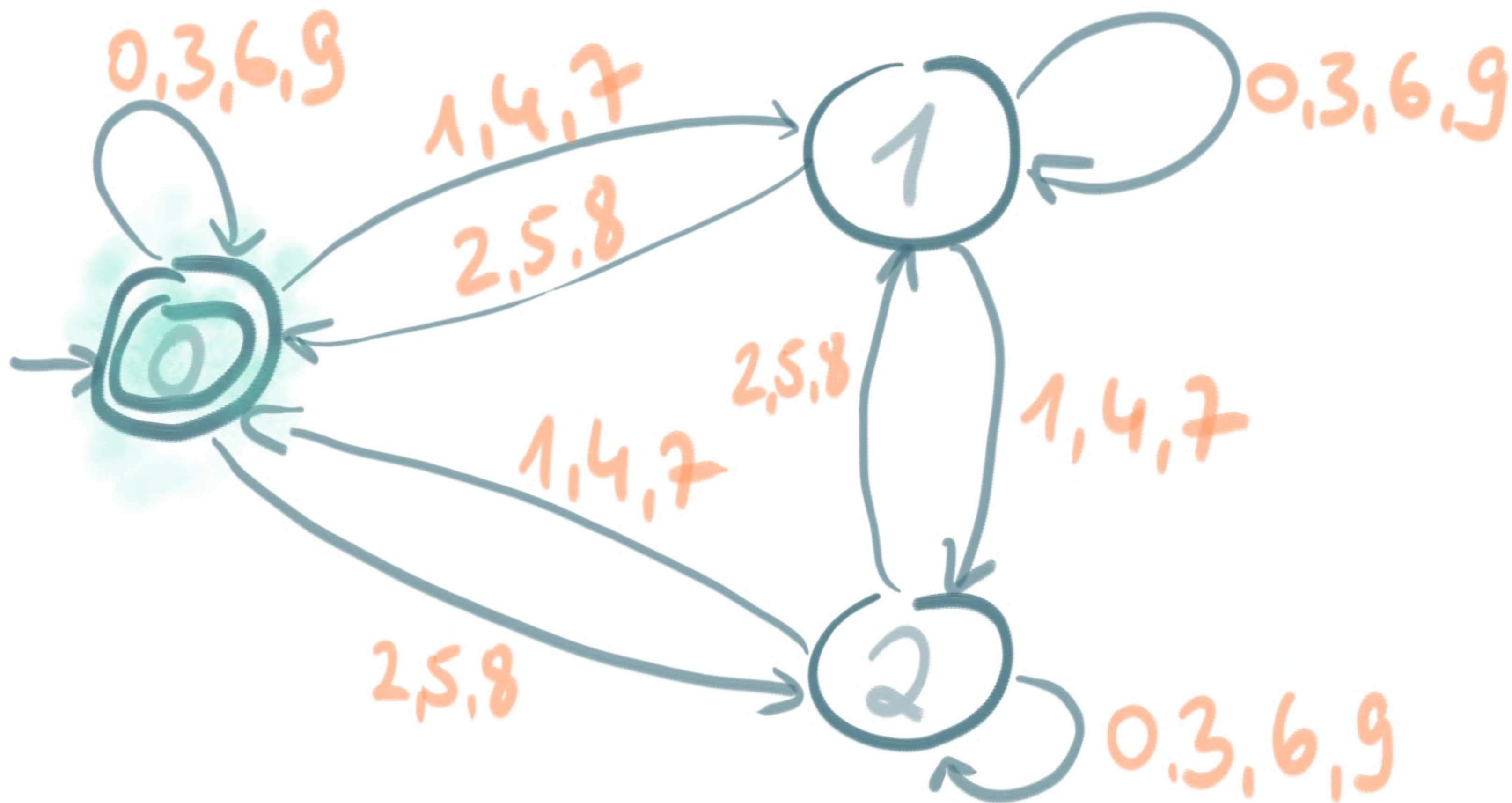


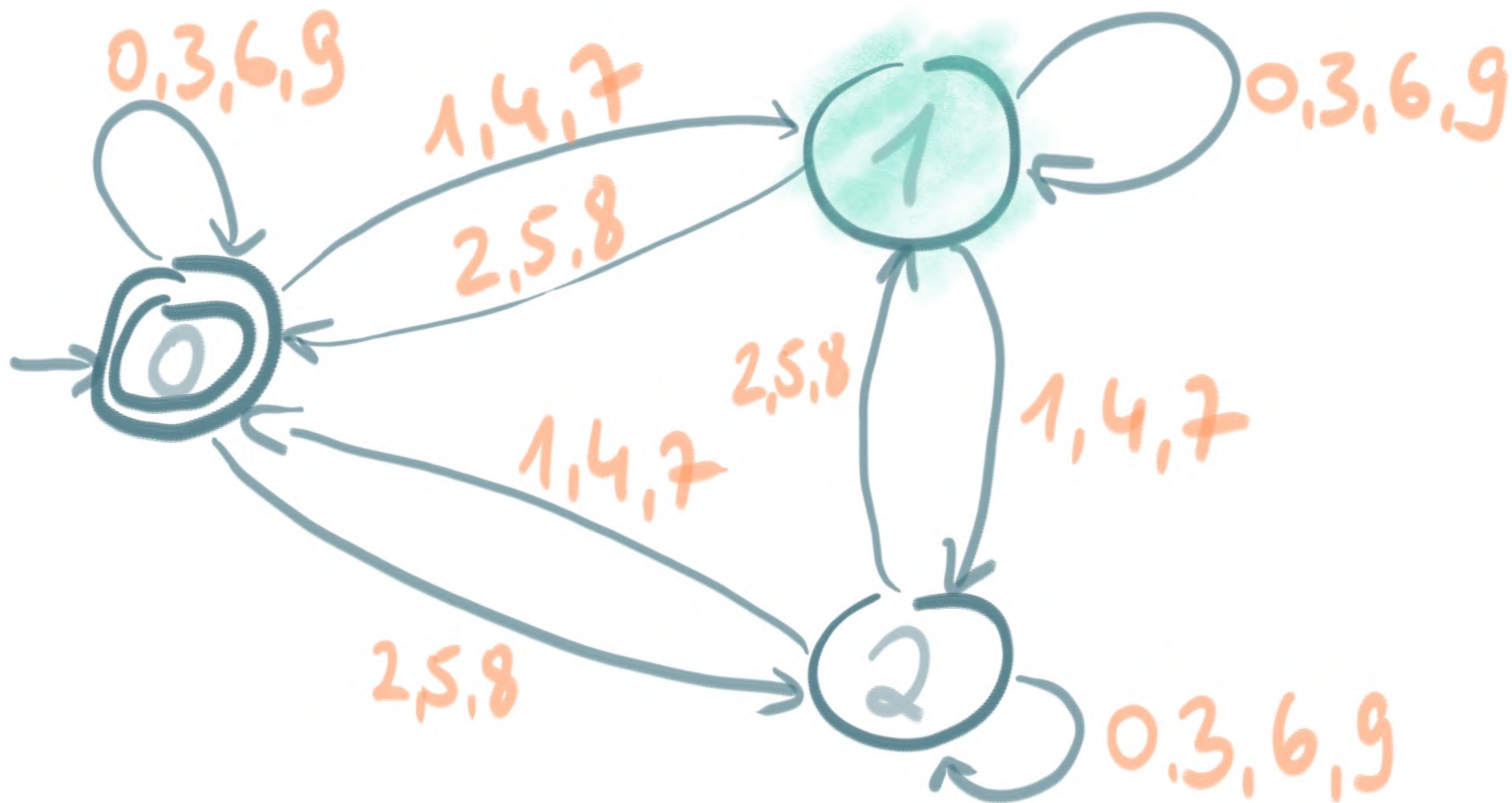








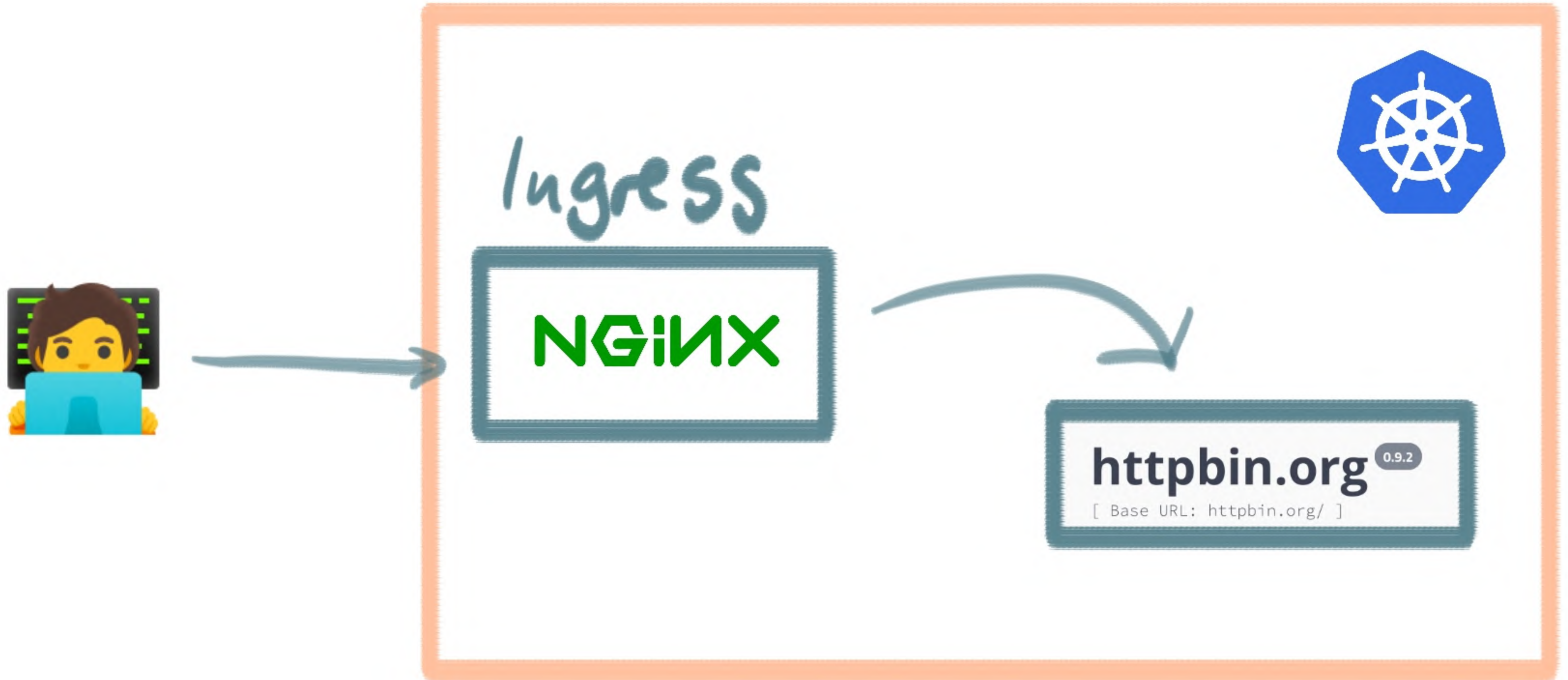






IMO# 9428750

Cluster





13
14
15
/ 15



NGINX



/ fizz
/ 4
/ buzz
/ fizzbuzz



apiVersion: networking.k8s.io/v1beta1

kind: Ingress

metadata:

name: fizzbuzz-5

annotations:

nginx.ingress.kubernetes.io/rewrite-target: /get?response=buzz

nginx.ingress.kubernetes.io/use-regex: "true"

spec:

rules:

– **http:**

paths:

– **path:** "/.*[05]\$"

backend:

serviceName: httpbin

servicePort: 80



$n \% 15 == 0$



```
/( [0369]|[147][0369]*([147]
[0369]*[258][0369]*)*([147]
[0369]*[147]|[258])|[258]
[0369]*([258][0369]*[147]
[0369]*)*([258][0369]*[258]|
[147]))*(0|[147][0369]*
([147][0369]*[258]
[0369]*)*5|[258][0369]*
([258][0369]*[147][0369]*)*
[258][0369]*5)$
```



Demo



**[github.com
/larsrh/fizzbuzz-k8s/](https://github.com/larsrh/fizzbuzz-k8s/)**



Carla Notarobot



@CarlaNotarobot

The plural of regex is regrets

12:01 AM · Aug 15, 2021 · Twitter for Android



Q&A



Lars Hupel

lars.hupel@innoq.com

[@larsr_h](#)

innoQ Deutschland GmbH

Krischerstr. 100
40789 Monheim
+49 2173 333660

Ohlauer Str. 43
10999 Berlin

Ludwigstr. 180E
63067 Offenbach

Kreuzstr. 16
80331 München

Hermannstr. 13
20095 Hamburg

Erftstr. 15-17
50672 Köln

Königstorggraben 11
90402 Nürnberg