

Roassal3 updates:

To infinity and **beyond**



Inria

Milton Mamani

1 September 2023
Lyon

Who I am?

Name: Milton Mamani Torres
Occupation: Software
Engineer in
Rmod team, Inria
Email: aevaluation@gmail.com
Country: Bolivia



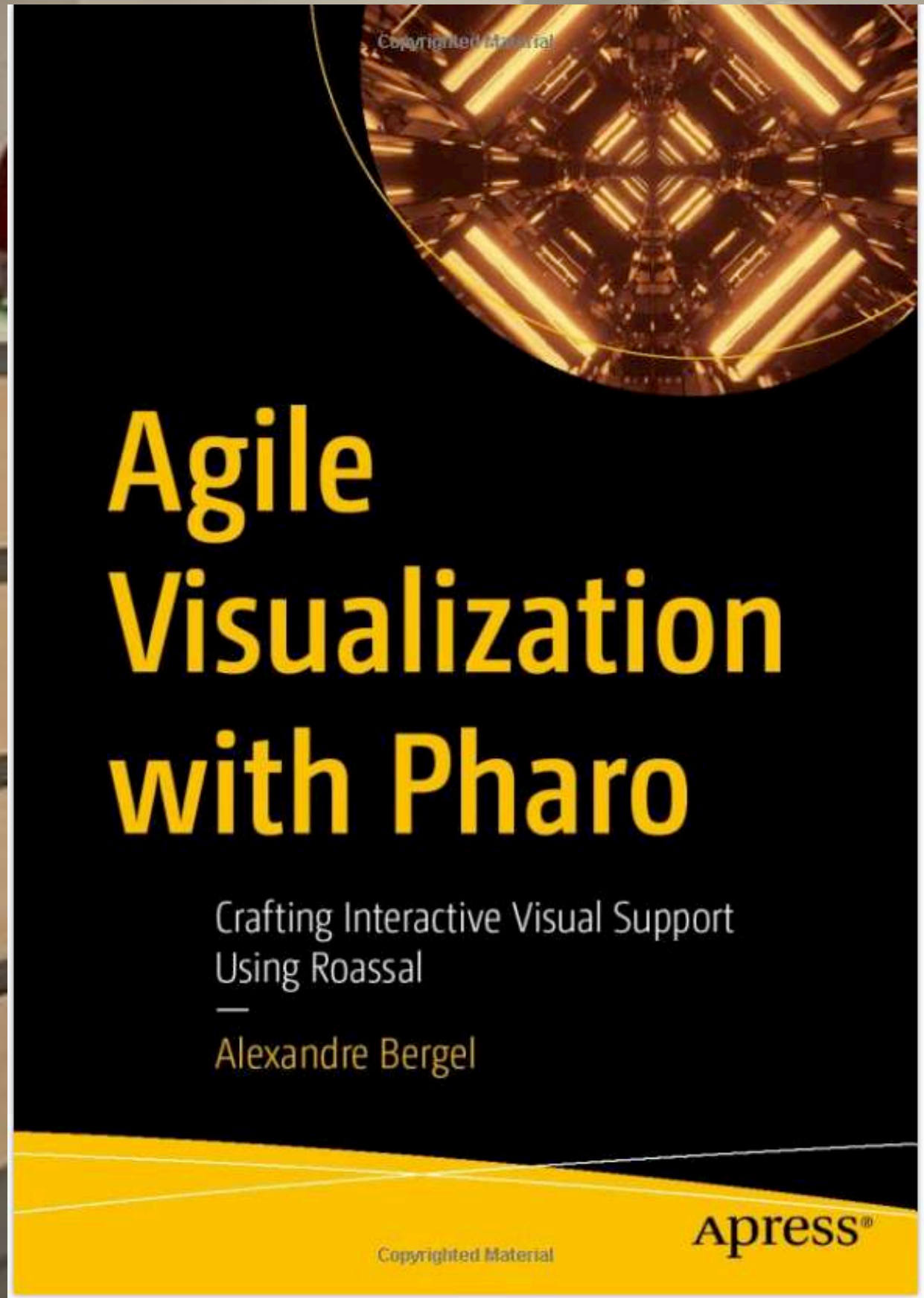
- Canvas
- Shapes
- Announcer
- Raw
- Breakpoints
- Meta



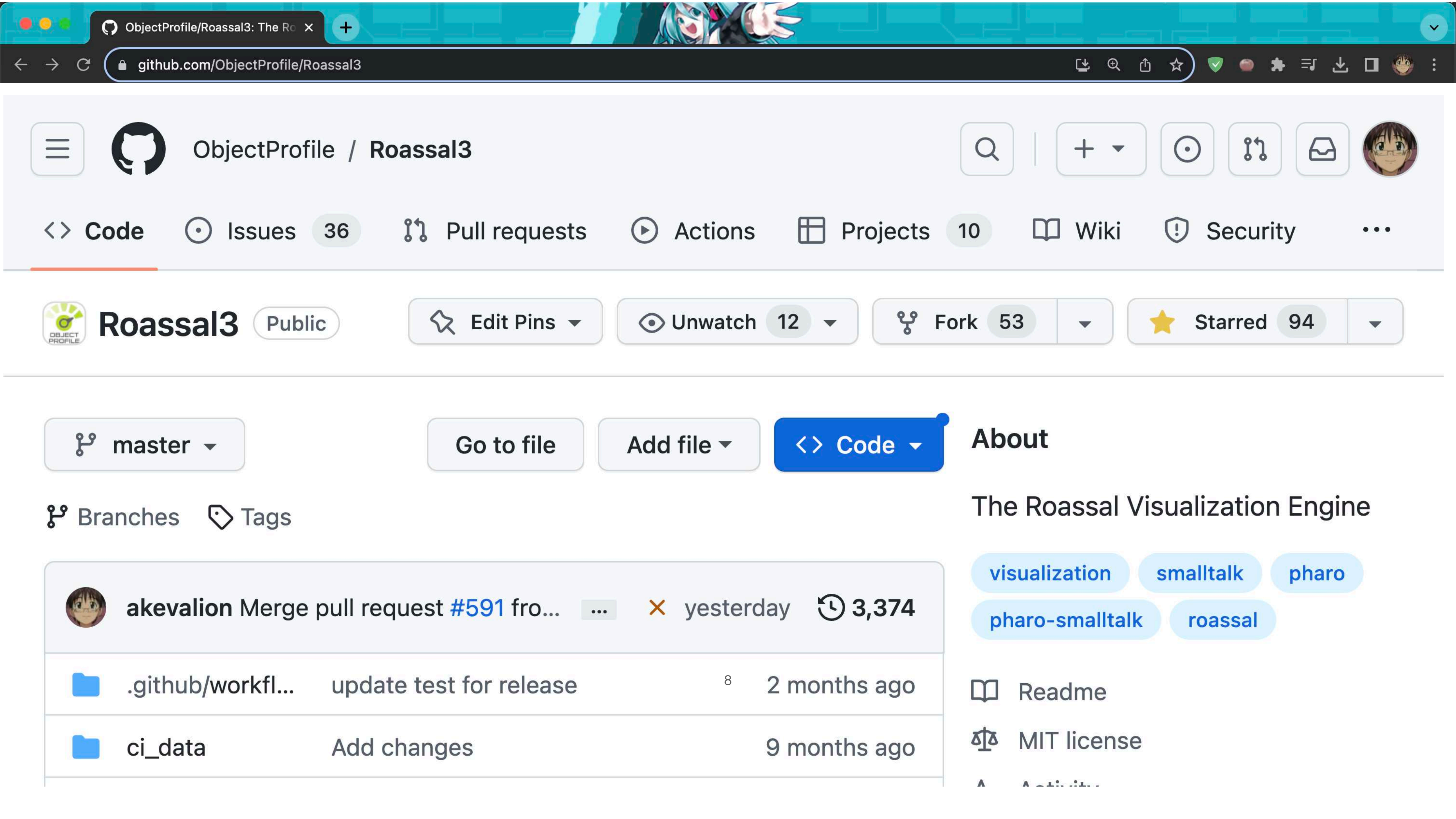
What is Roassal?



A tool to visualize data



Created by:
**Alexandre
Bergel**
<http://bergel.eu/>



	akevalion Merge pull request #591 fro...	...	✗ yesterday	🕒 3,374
	.github/workfl...	update test for release	8	2 months ago
	ci_data	Add changes		9 months ago

About

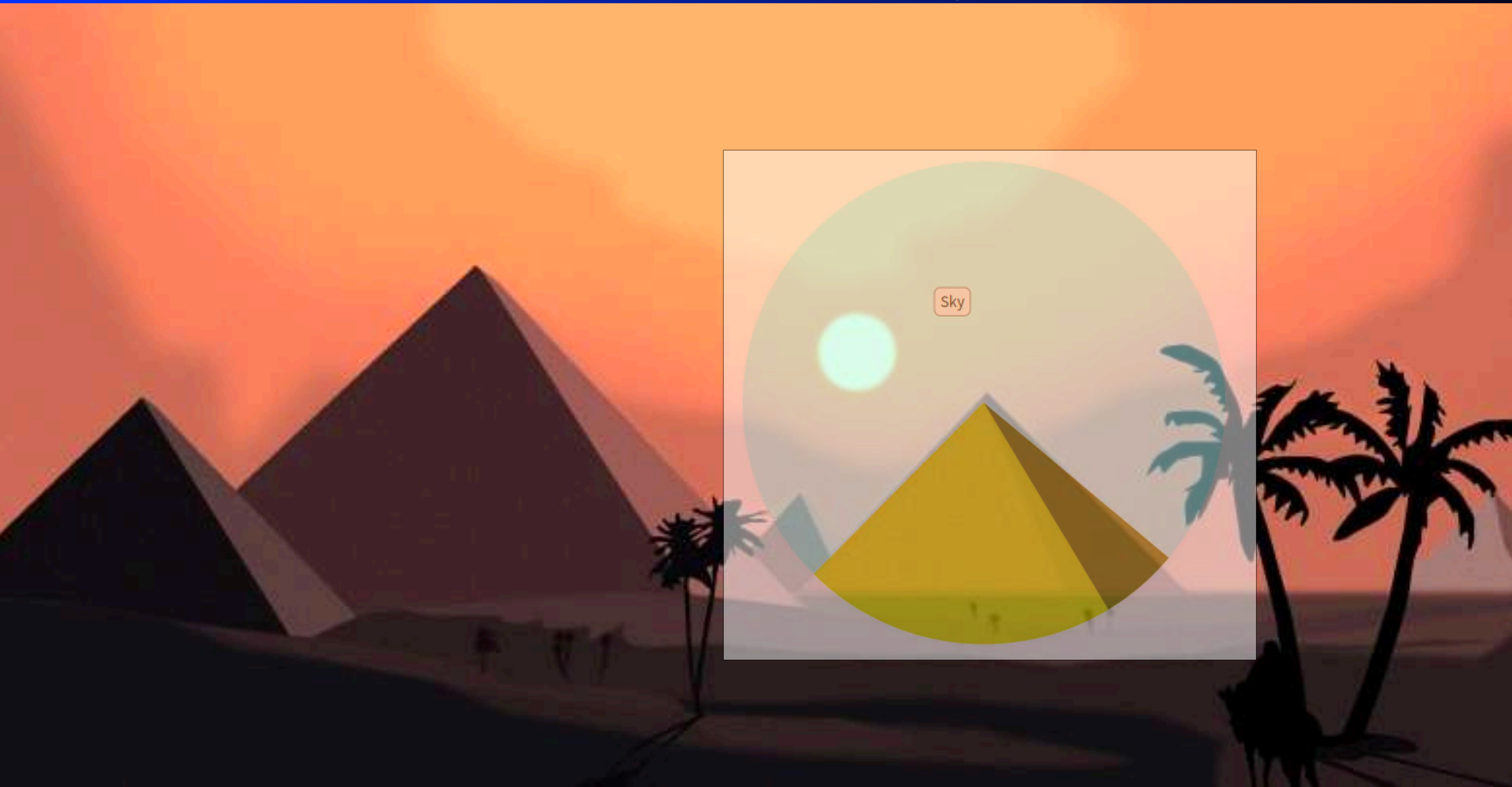
The Roassal Visualization Engine

- visualization
- smalltalk
- pharo
- pharo-smalltalk
- roassal

Readme

MIT license

Based on Cairo vector graphics



What is data visualization?

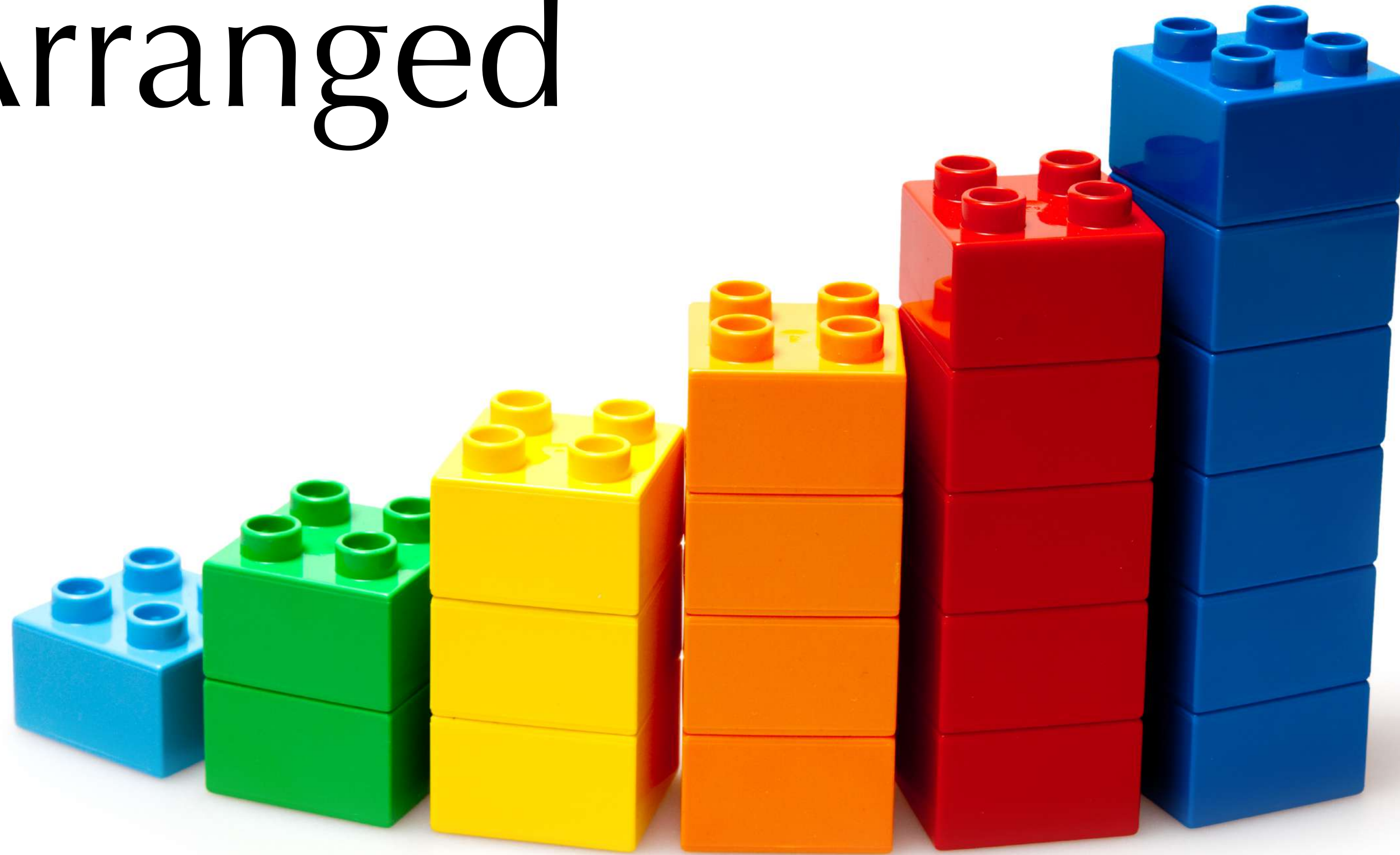
Data



Sorted



Arranged





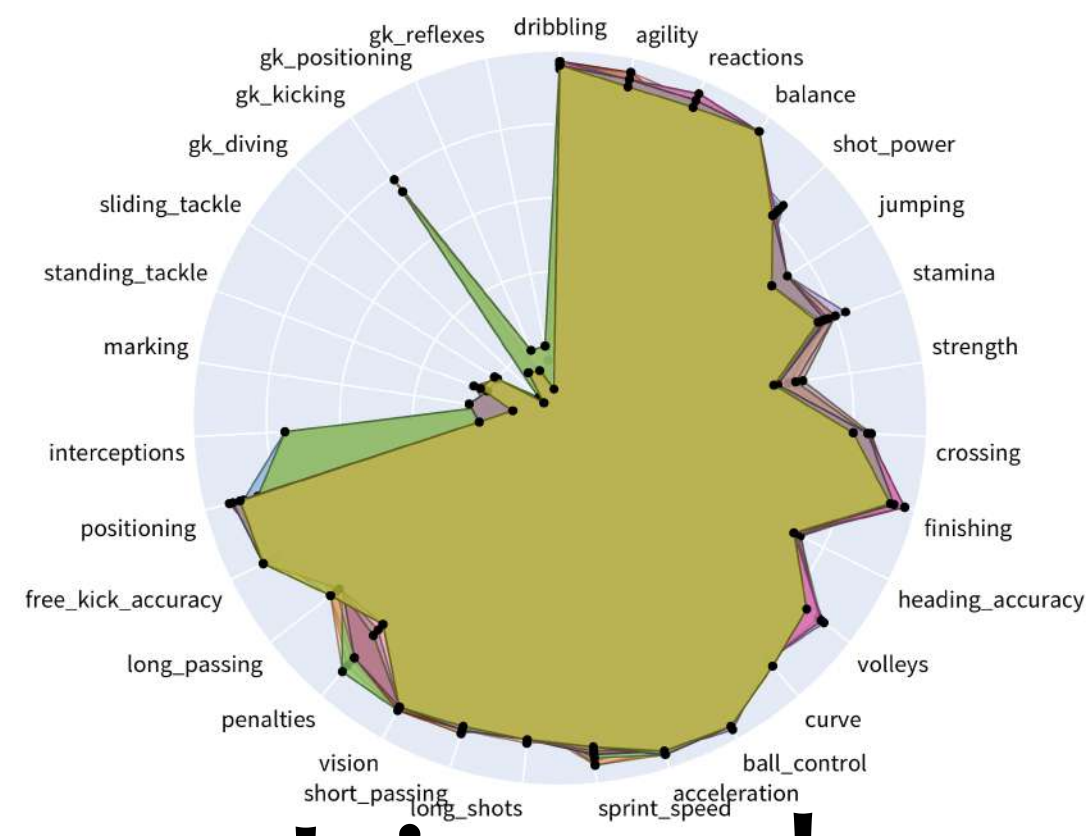
Explained
with a story

Data can have many presentations

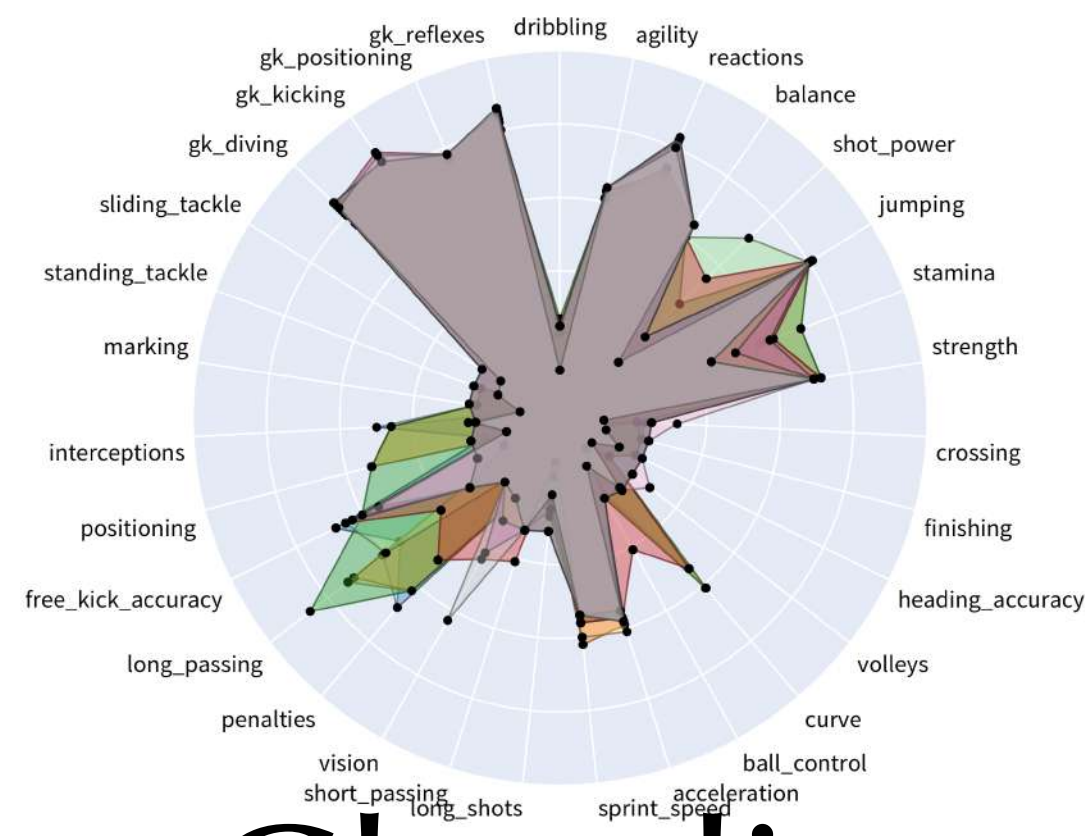


A striker

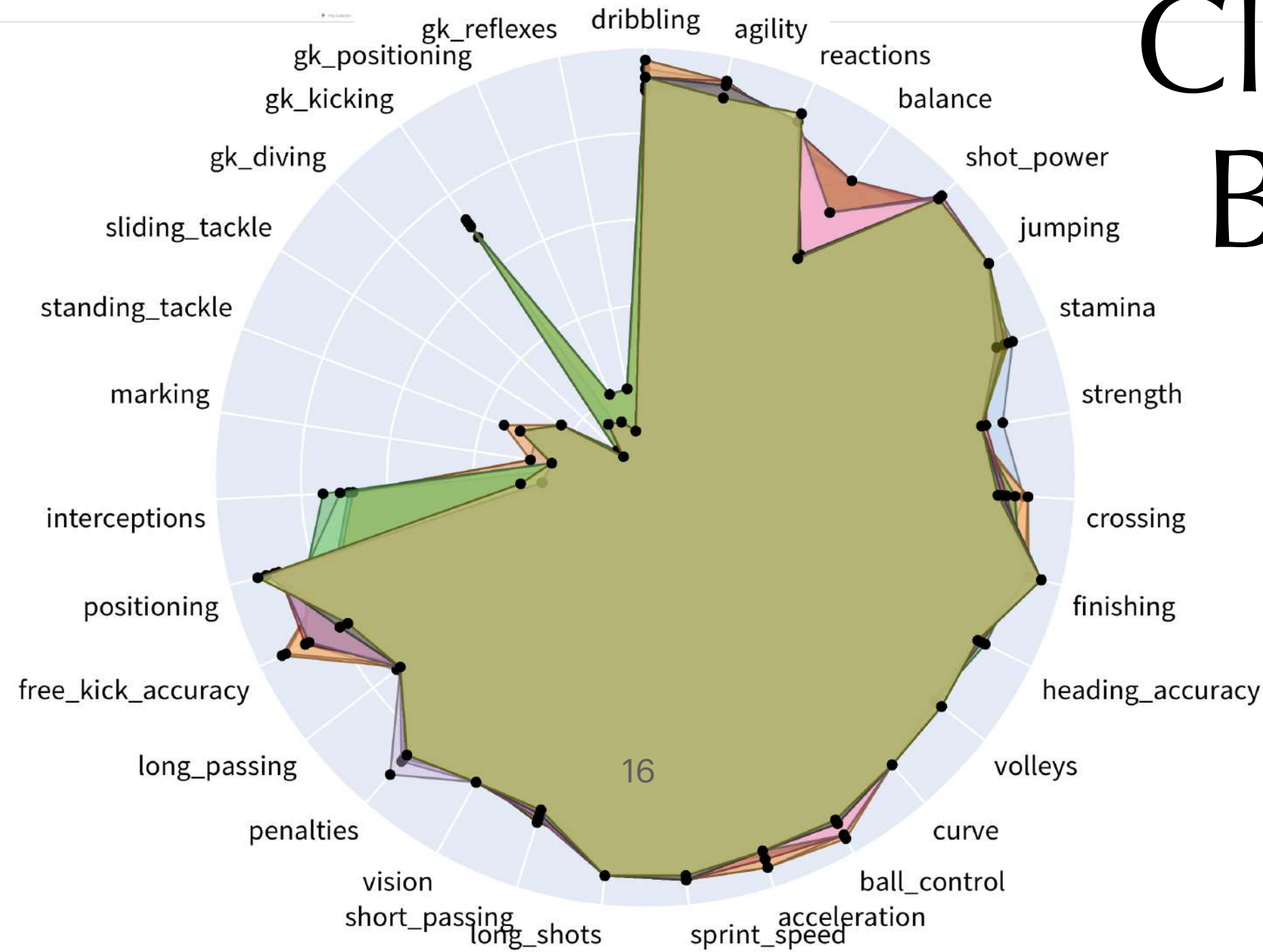
A goalkeeper



Lionel Messi



Claudio Bravo



Cristiano Ronaldo

DEMO

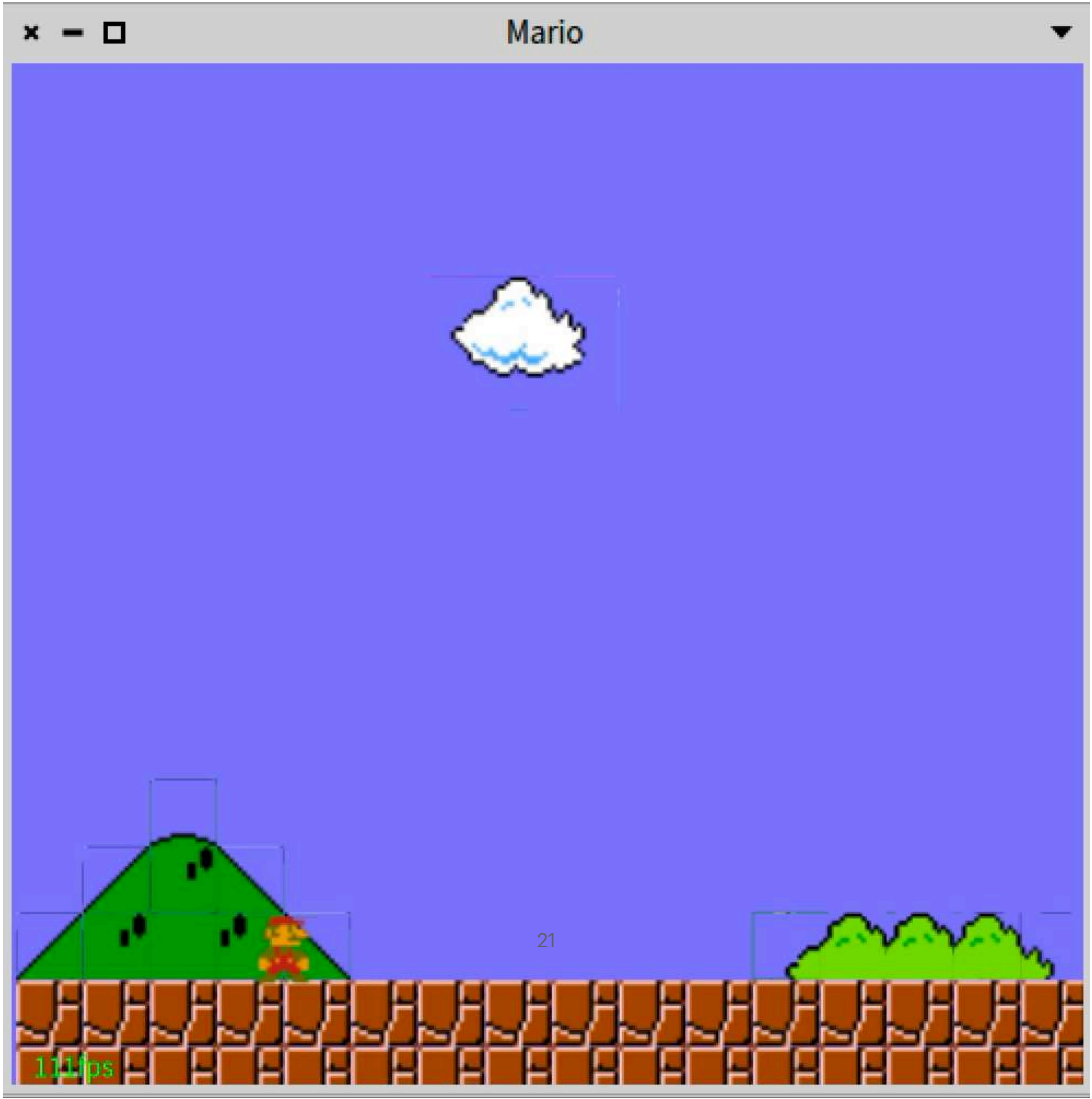
Noises and Animations



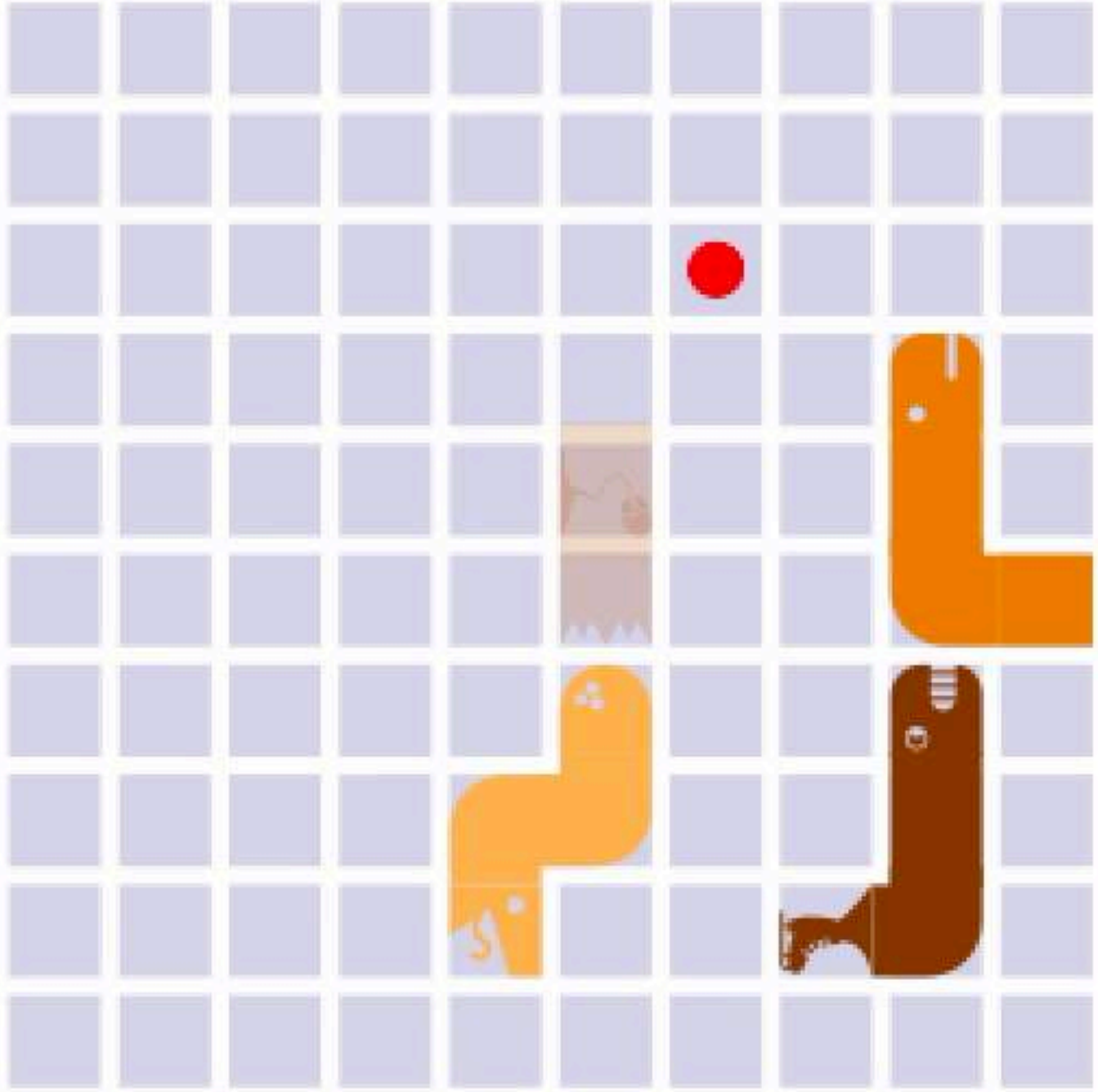


Do it Publish Bindings Versions Pages

```
1 RSCat new run
```



Snake



Turn: 6

snake1	4
snake2	3
Ran into snake4's body	
snake3	4
snake4	4

22

The image shows a window titled "Snake" containing a 10x10 grid. A red dot is located at the intersection of the 3rd row and 6th column. Four snakes are on the grid: snake1 (dark brown, 4 cells), snake2 (light brown, 3 cells), snake3 (orange, 4 cells), and snake4 (dark brown, 4 cells). Snake2 is positioned at the 5th row, 5th column and is surrounded by a jagged, jagged border, indicating it has just died. To the right of the grid is a status panel titled "Turn: 6" showing the length of each snake and a message "Ran into snake4's body" next to snake2's length.



NEW FEATURES

Charts

You can(not) plot

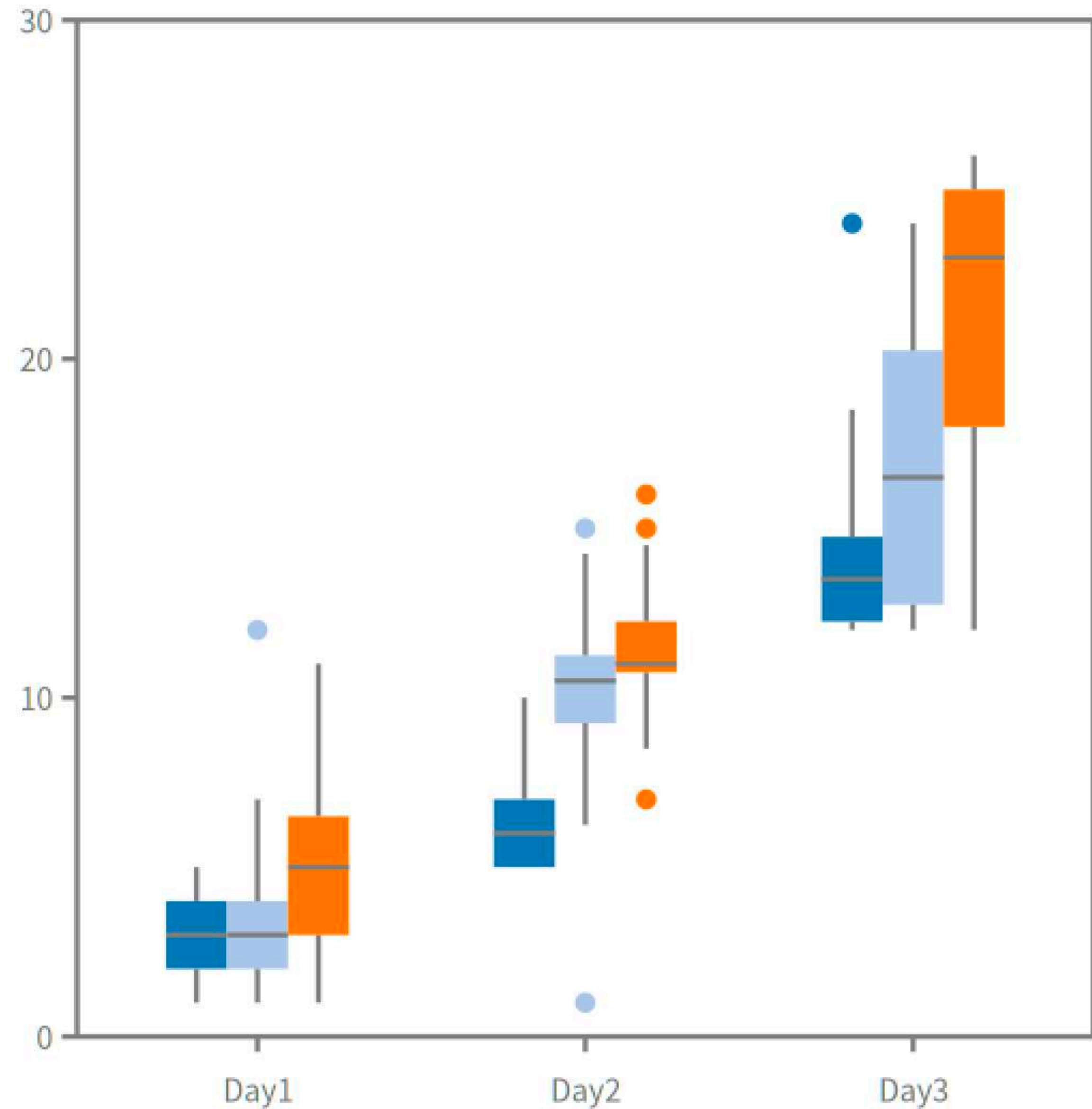
```
1 | c p p2 p3 y y2 y3 size x |
2 x := { 'Day1'. 'Day2'. 'Day3' }.
3 y := { { 1. 2. 3. 4. 5. }.
4         { 5. 6. 7. 5. 10. }.
5         { 12. 12. 13. 14. 15. 24. } }.
6
7 y2 := { { 1. 2. 2. 2. 3. 4. 3. 5. 12. }.
8         { 1. 12. 7. 10. 11. 11. 15. 10. }.
9         { 12. 12. 13. 15. 18. 20. 21. 24. } }.
10
11 y3 := { { 1. 2. 3. 3. 3. 5. 3. 5. 5. 7. 8. 5. 6. 10. 11. }.
12         { 12. 7. 10. 11. 11. 13. 10. 11. 12. 11. 15. 16. }.
13         { 12. 12. 13. 15. 18. 20. 21. 24. 25. 24. 25. 26. 24. 23. 23. 25. 25. } }.
```

You can(not) plot

```
15 c := RSChart new.
16 p := RSBoxPlot new y: y.
17
18 "size controls the width of the bars"
19 size := 12.
20 p barSize: size.
21 p barOffset: size * -1.
22
23 p2 := RSBoxPlot new y: y2.
24 p2 barSize: size.
25 p2 barOffset: 0.
26
27 p3 := RSBoxPlot new y: y3.
28 p3 barSize: size.
29 p3 barOffset: size.
30
31 c addPlot: p.
32 c addPlot: p2.
33 c addPlot: p3.
34 c addDecoration: (RSHorizontalTick new fromNames: x).
35 c addDecoration: (RSVerticalTick new integer).
36
37 ^ c
```

You can(not) plot

```
15 c := RSChart new.  
16 p := RSBoxPlot new y: y.  
17  
18 "size controls the width of the bars"  
19 size := 12.  
20 p barSize: size.  
21 p barOffset: size * -1.  
22  
23 p2 := RSBoxPlot new y: y2.  
24 p2 barSize: size.  
25 p2 barOffset: 0.  
26  
27 p3 := RSBoxPlot new y: y3.  
28 p3 barSize: size.  
29 p3 barOffset: size.  
30  
31 c addPlot: p.  
32 c addPlot: p2.  
33 c addPlot: p3.  
34 c addDecoration: (RSHorizontalTick new fromNames: x).  
35 c addDecoration: (RSVerticalTick new integer).  
36  
37 ^ c
```

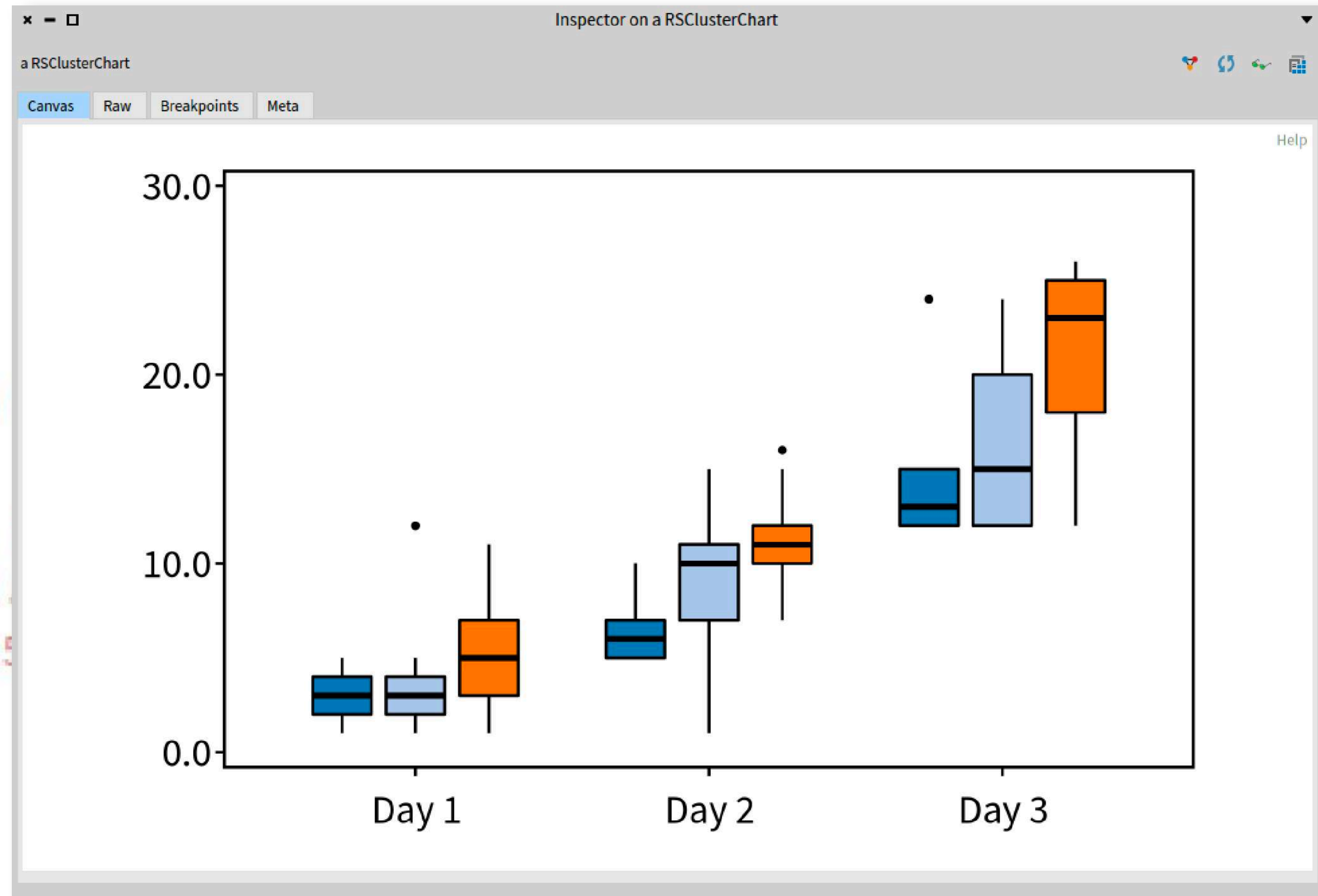


You can(not) plot

```
1 | chart p1 p2 p3 y1 y2 y3 |
2 y1 := { { 1. 2. 3. 4. 5. }.
3         { 5. 6. 7. 5. 10. }.
4         { 12. 12. 13. 14. 15. 24. } }.
5
6 y2 := { { 1. 2. 2. 2. 3. 4. 3. 5. 12. }.
7         { 1. 12. 7. 10. 11. 11. 15. 10. }.
8         { 12. 12. 13. 15. 18. 20. 21. 24. } }.
9
10 y3 := { { 1. 2. 3. 3. 3. 5. 3. 5. 5. 7. 8. 5. 6. 10. 11. }.
11         { 12. 7. 10. 11. 11. 13. 10. 11. 12. 11. 15. 16. }.
12         { 12. 12. 13. 15. 18. 20. 21. 24. 25. 24. 25. 26. 24. 23. 23. 25. 25. } }.
13
14 p1 := RSBoxPlot data: y1. "blue"
15 p2 := RSBoxPlot data: y2. "sky blue"
16 p3 := RSBoxPlot data: y3. "orange"
17 chart := p1 + p2 + p3.
18 chart xTickLabels: { 'Day 1'. 'Day 2'. 'Day 3' }.
19 ^ chart.
```

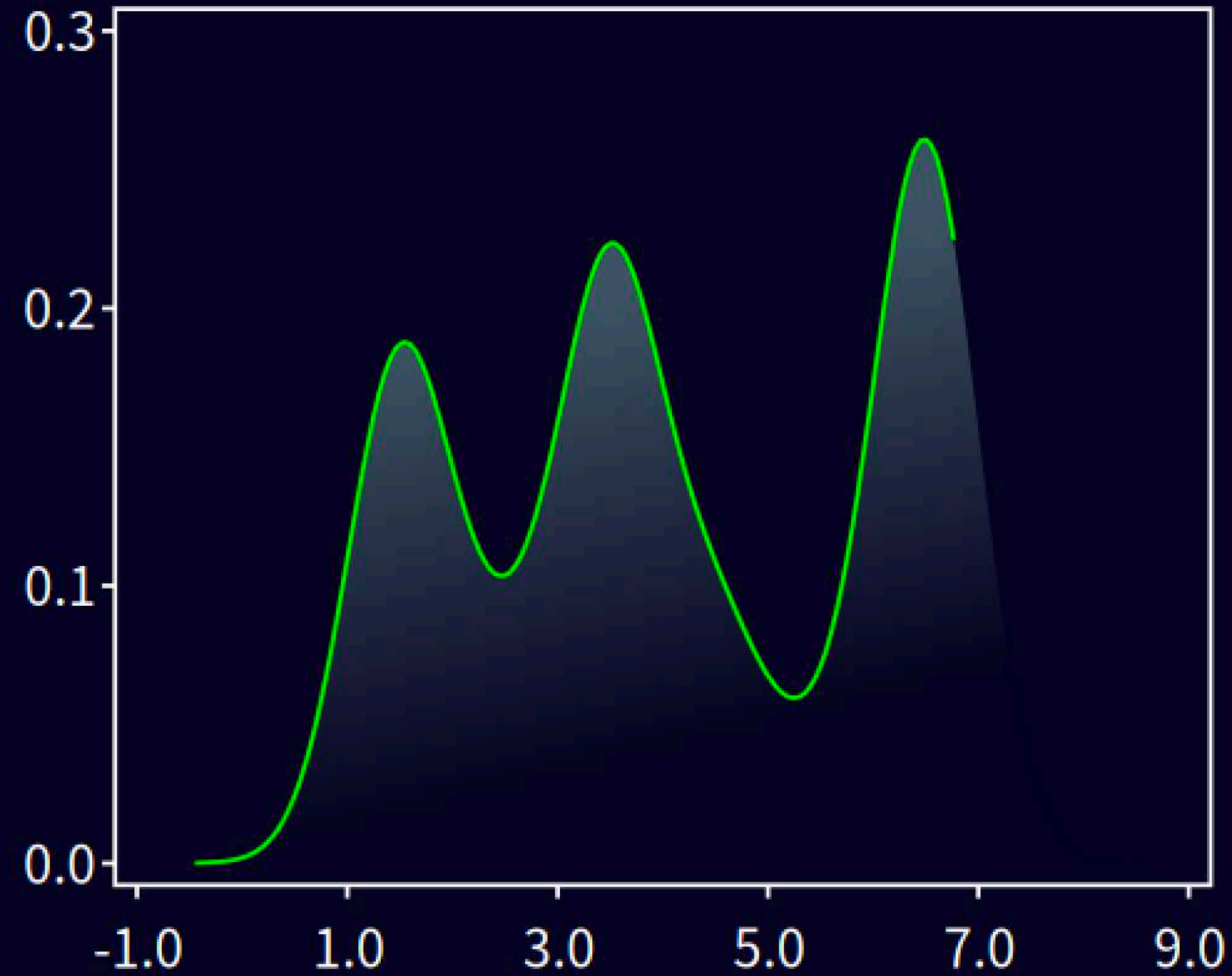
You can(not) plot

```
1 | chart p1 p2 p3 y1 y2 y3 |
2 y1 := { { 1. 2. 3. 4. 5. }.
3         { 5. 6. 7. 5. 10. }.
4         { 12. 12. 13. 14. 15. 24. } }.
5
6 y2 := { { 1. 2. 2. 2. 3. 4. 3. 5. 12. }.
7         { 1. 12. 7. 10. 11. 11. 15. 10. }.
8         { 12. 12. 13. 15. 18. 20. 21. 24. } }.
9
10 y3 := { { 1. 2. 3. 3. 3. 5. 3. 5. 5. 7. 8.
11          { 12. 7. 10. 11. 11. 13. 10. 11. 12.
12          { 12. 12. 13. 15. 18. 20. 21. 24. 25.
13
14 p1 := RSBoxPlot data: y1. "blue"
15 p2 := RSBoxPlot data: y2. "sky blue"
16 p3 := RSBoxPlot data: y3. "orange"
17 chart := p1 + p2 + p3.
18 chart xTickLabels: { 'Day 1'. 'Day 2'. 'Day 3' }.
19 ^ chart.
```



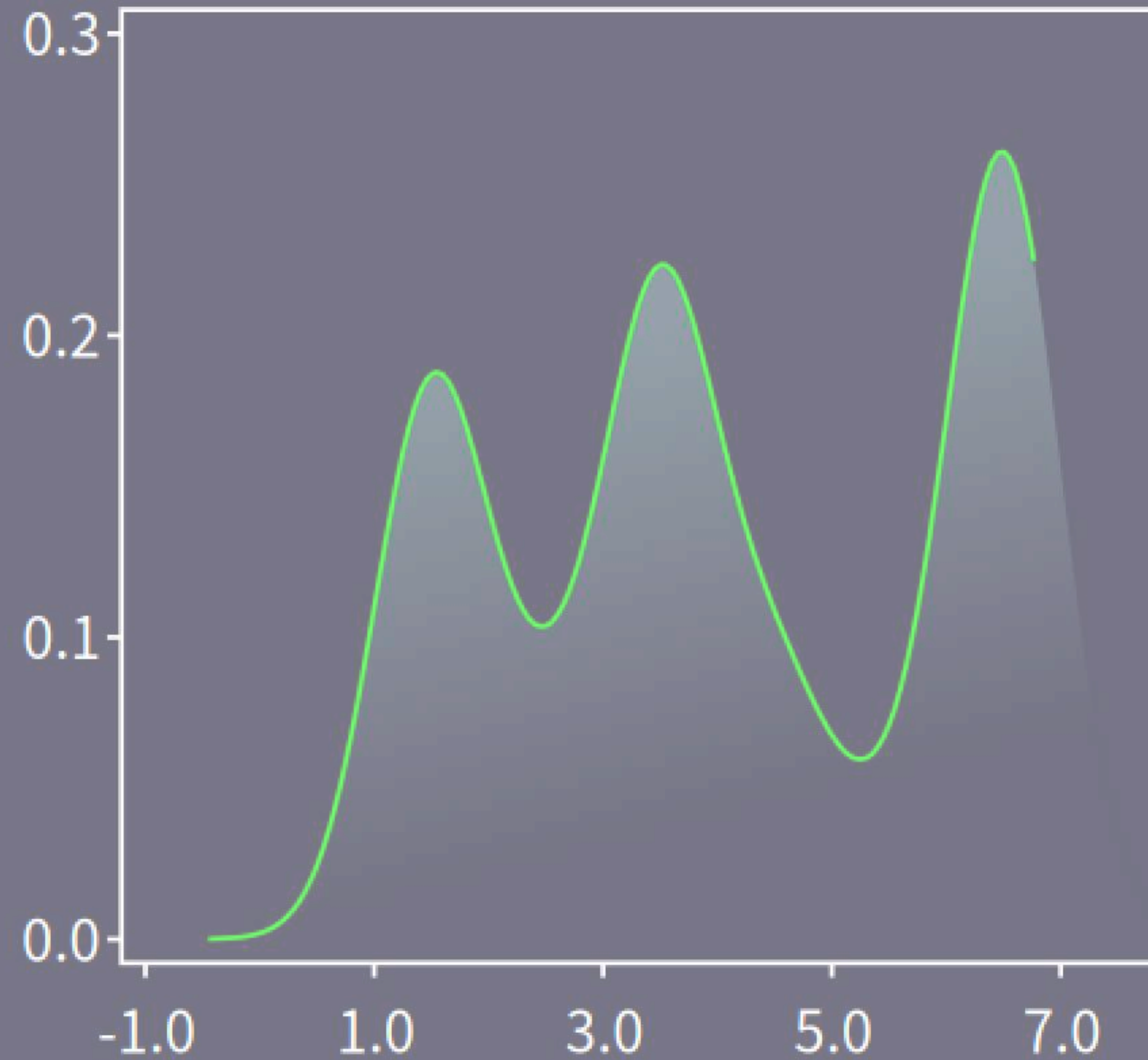
Density Plot

LES OPPORTUNITÉS
SE MULTIPLIENT

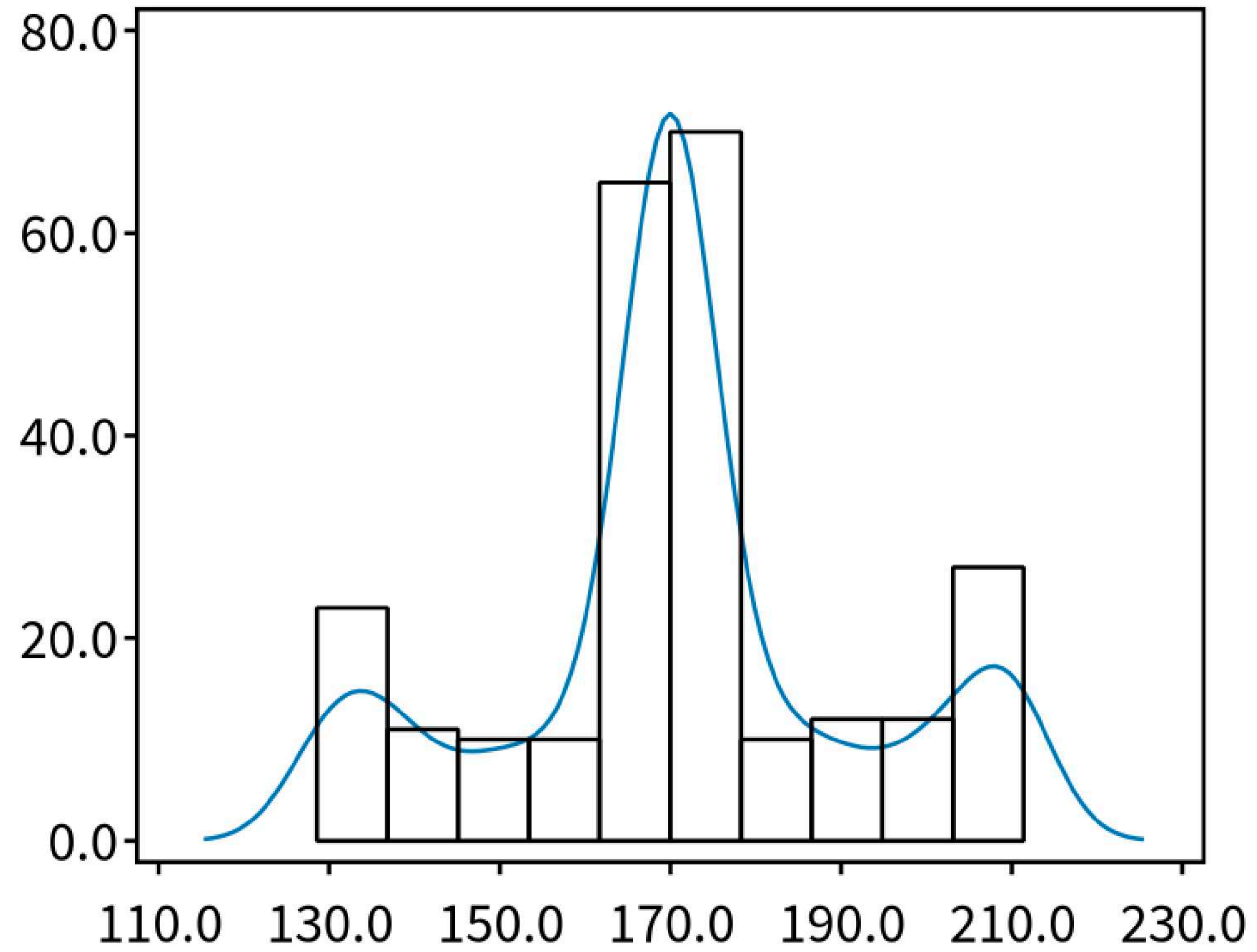


Density Plot

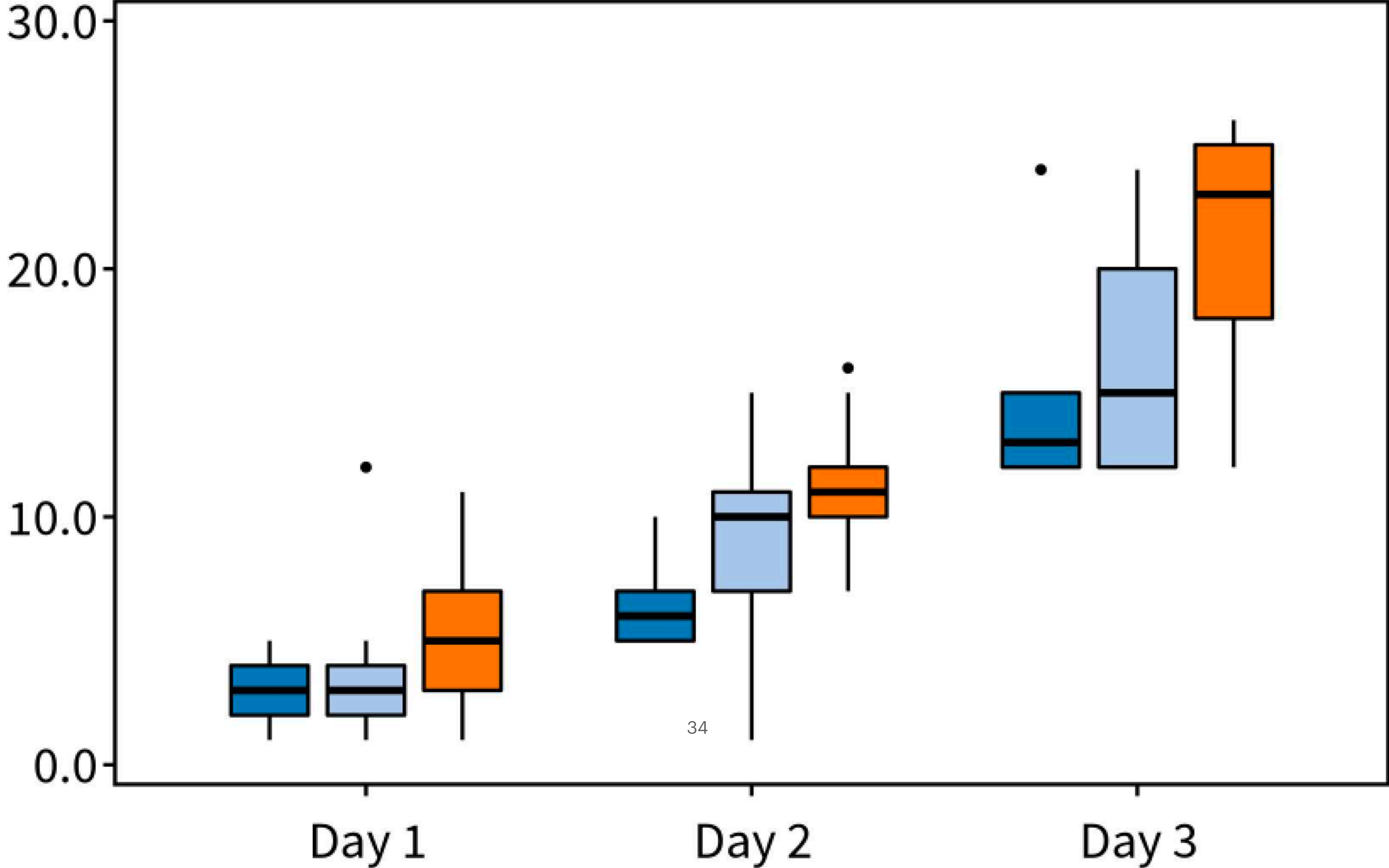
LES OPPORTUNITÉS
SE MULTIPLIENT



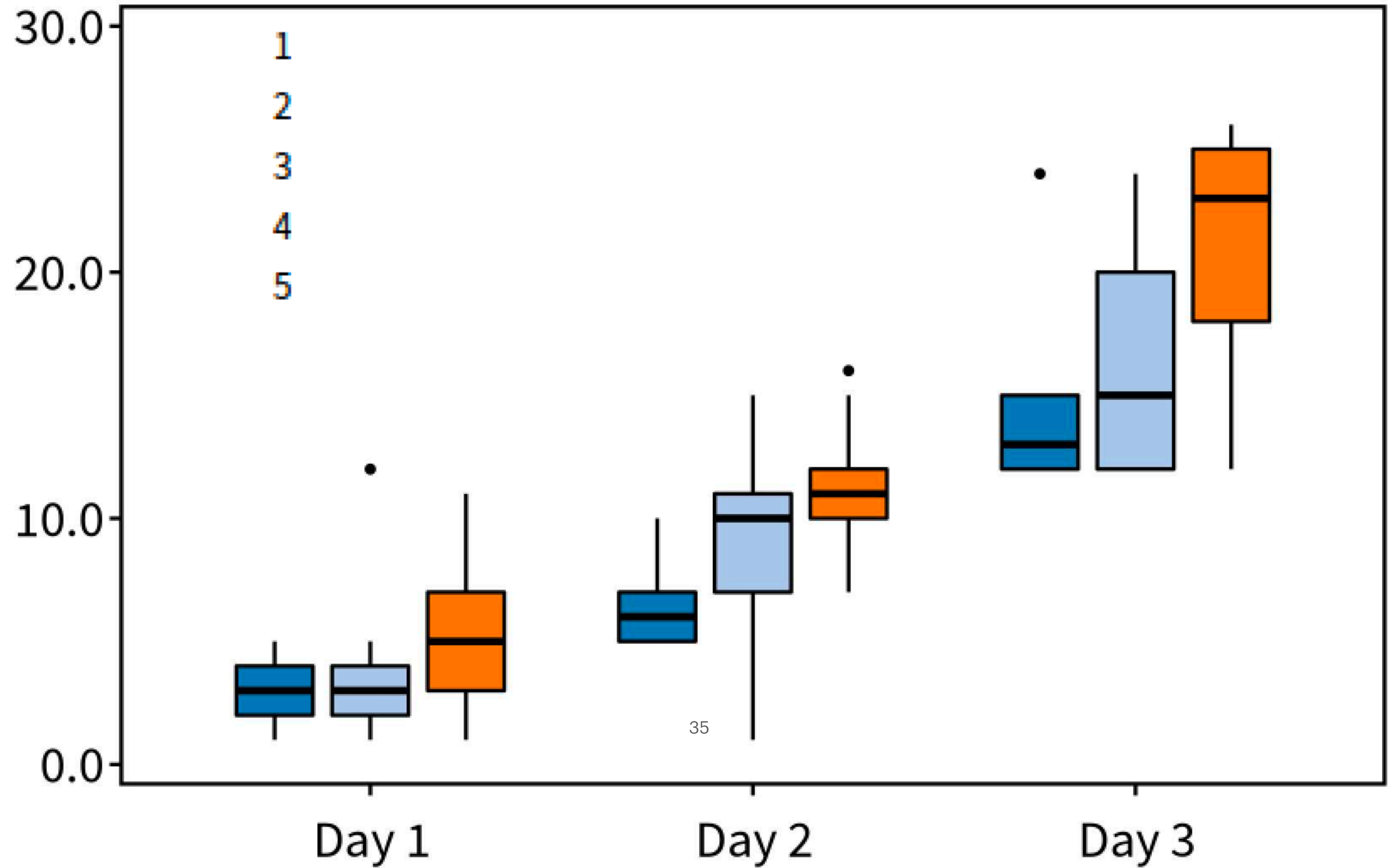
Density Plot



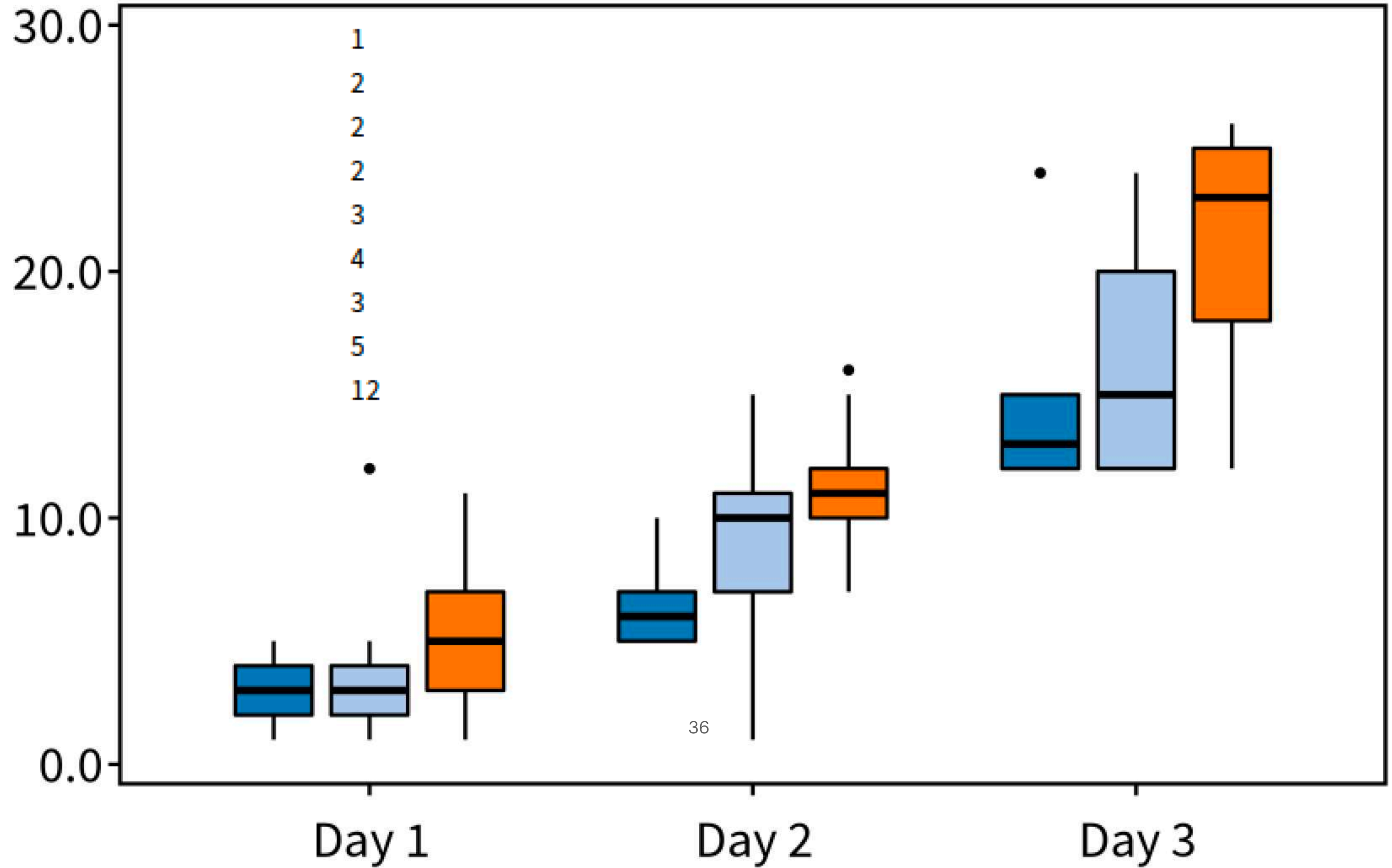
Box Plot



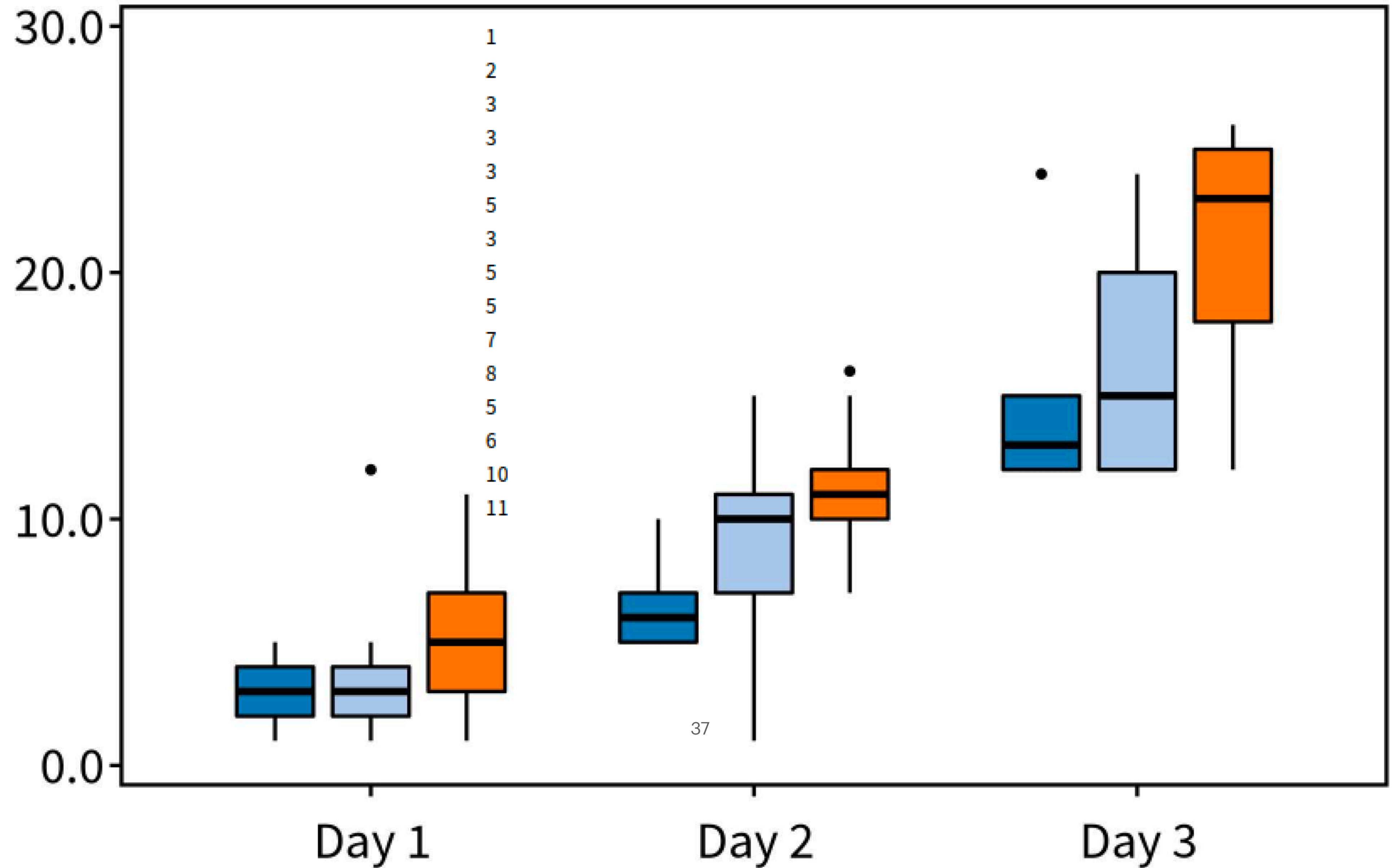
Box Plot



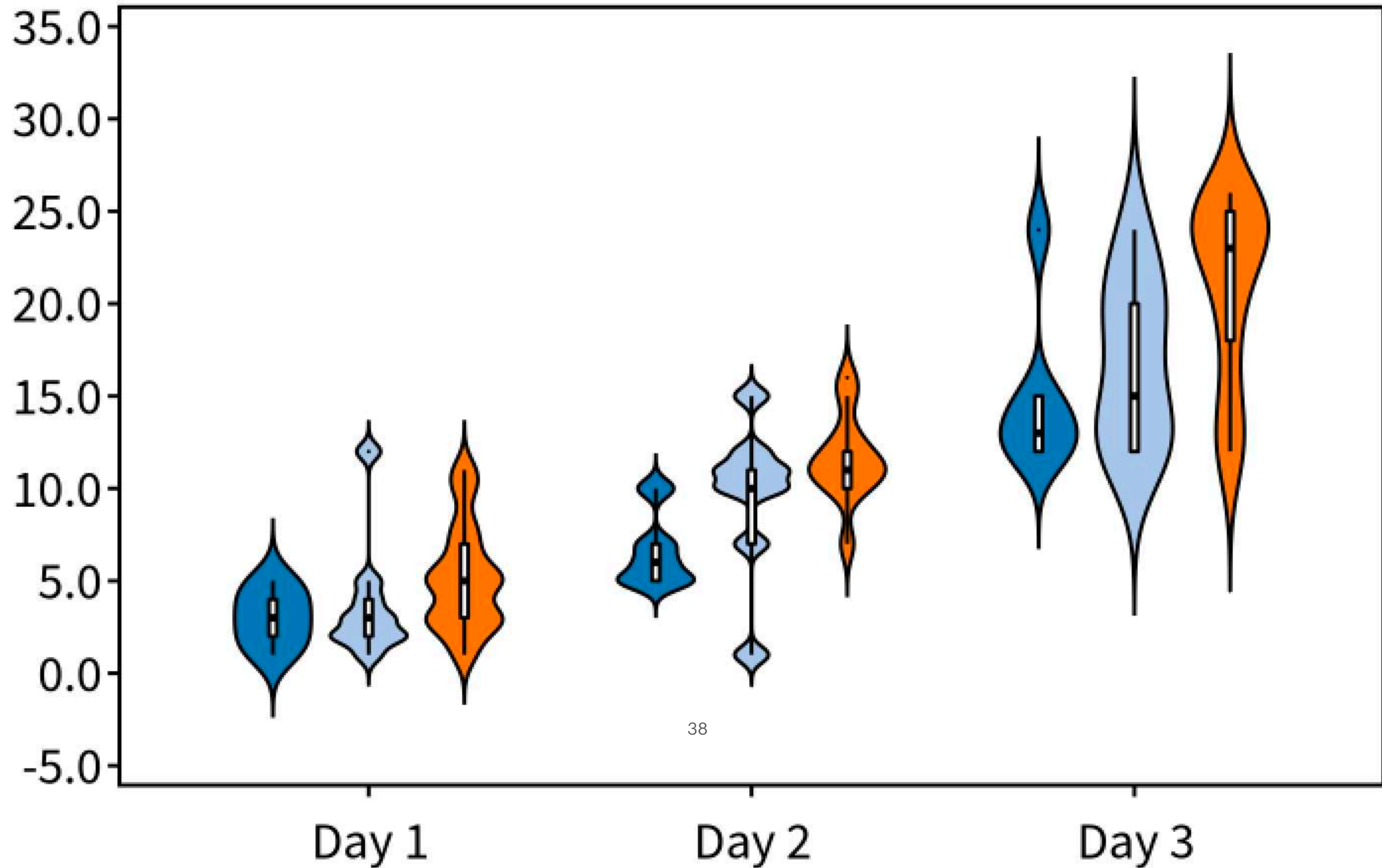
Box Plot



Box Plot

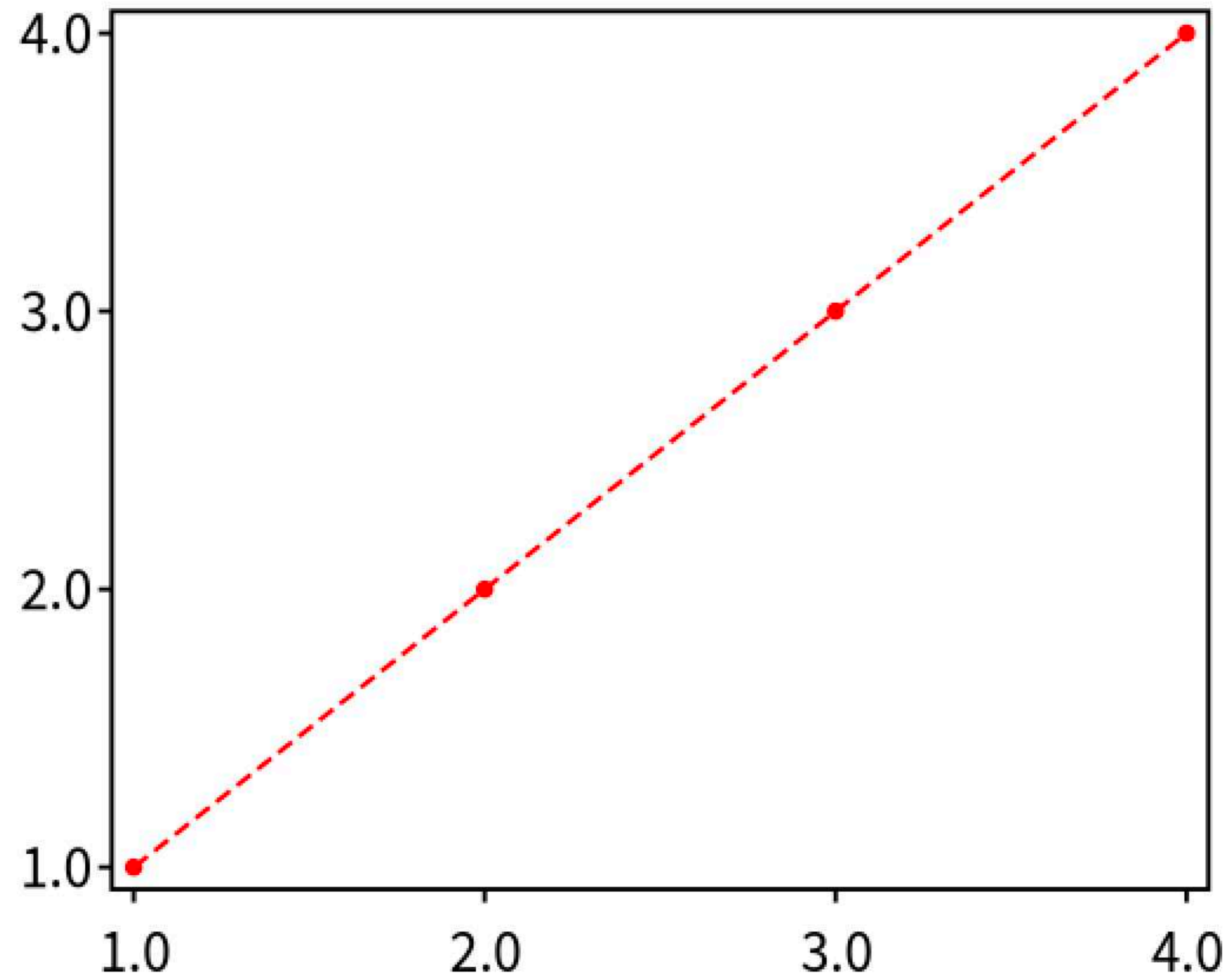


Violin Plot



One plot

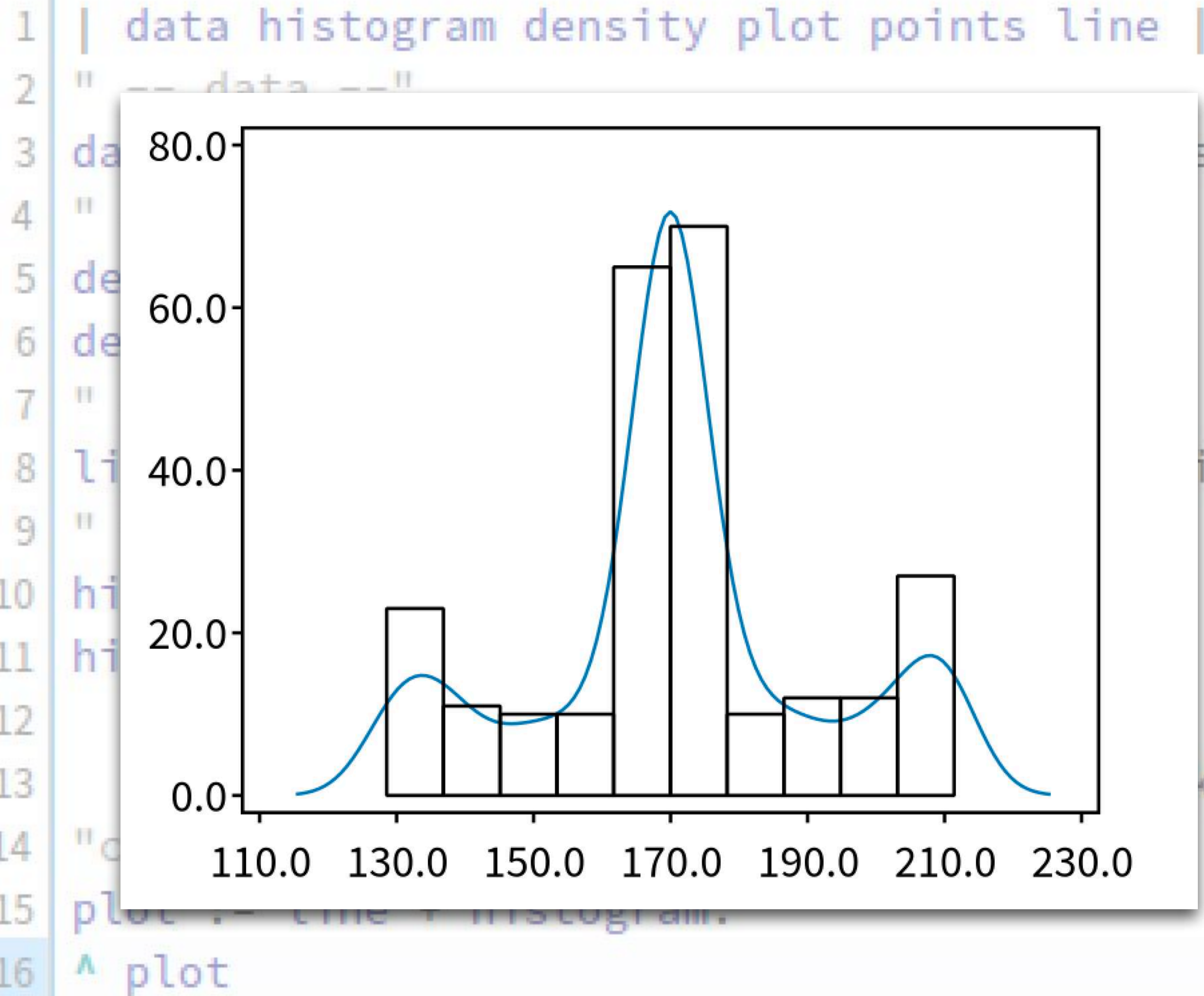
```
1 | linePlot |  
2 linePlot := (RSLinePlot y: #(1 2 3 4)) format: 'or--'.  
3 ^ linePlot open.
```



Combine plot

```
1 | data histogram density plot points line |
2 " -- data --"
3 data := RSHistogramExample new randomValues.
4 " -- density --"
5 density := RSDensityPlot data: data.
6 density bandwidth: 5.
7 " -- lineplot --"
8 line := RSLinePlot points: density curvePoints.
9 " -- histogram --"
10 histogram := RSHistogramPlot new x: data.
11 histogram masterShape
12     color: Color transparent;
13     border: (RSBorder new color: Color black).
14 "combination plot"
15 plot := line + histogram.
16 ^ plot
```

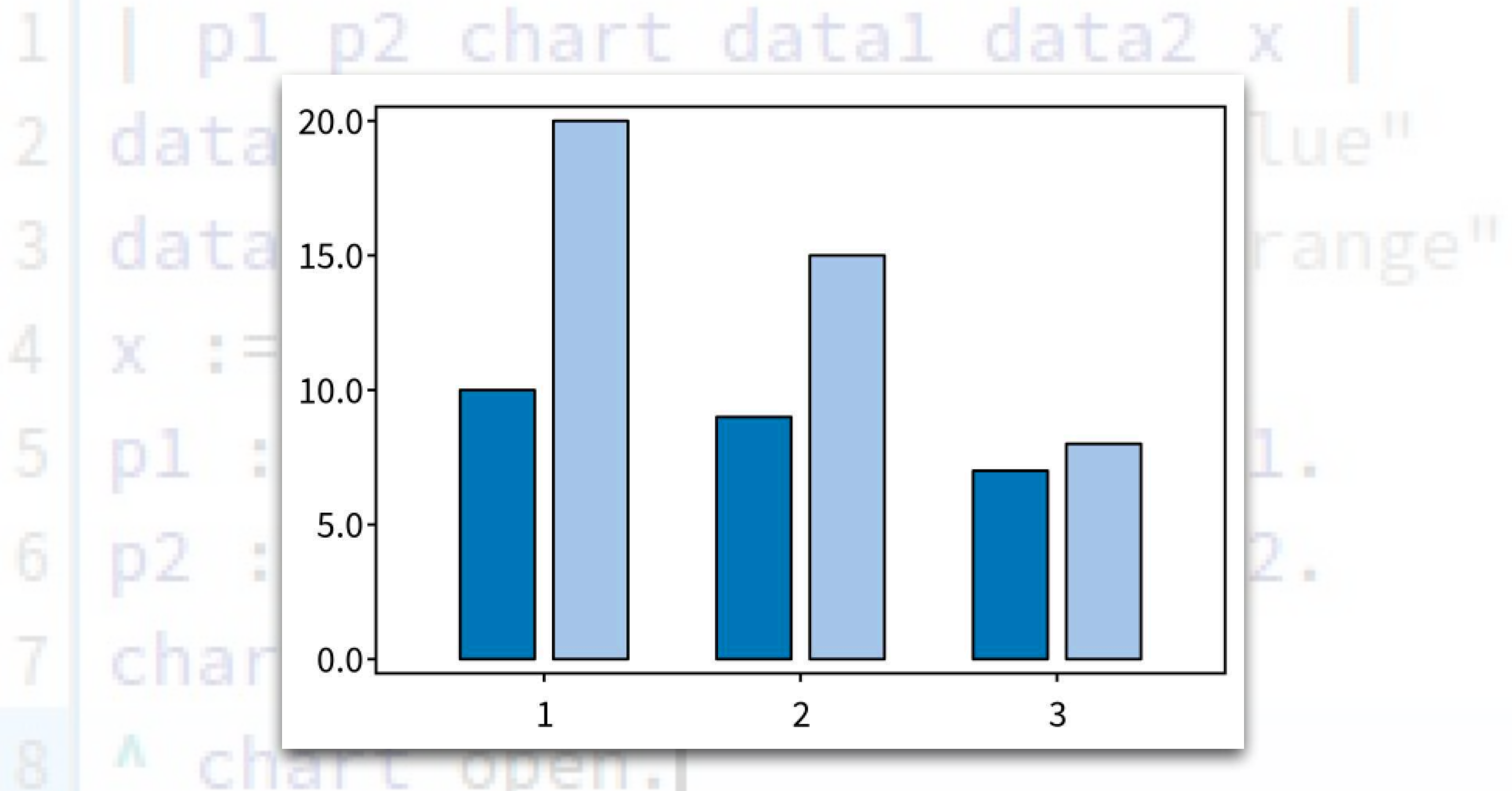

Combine plot



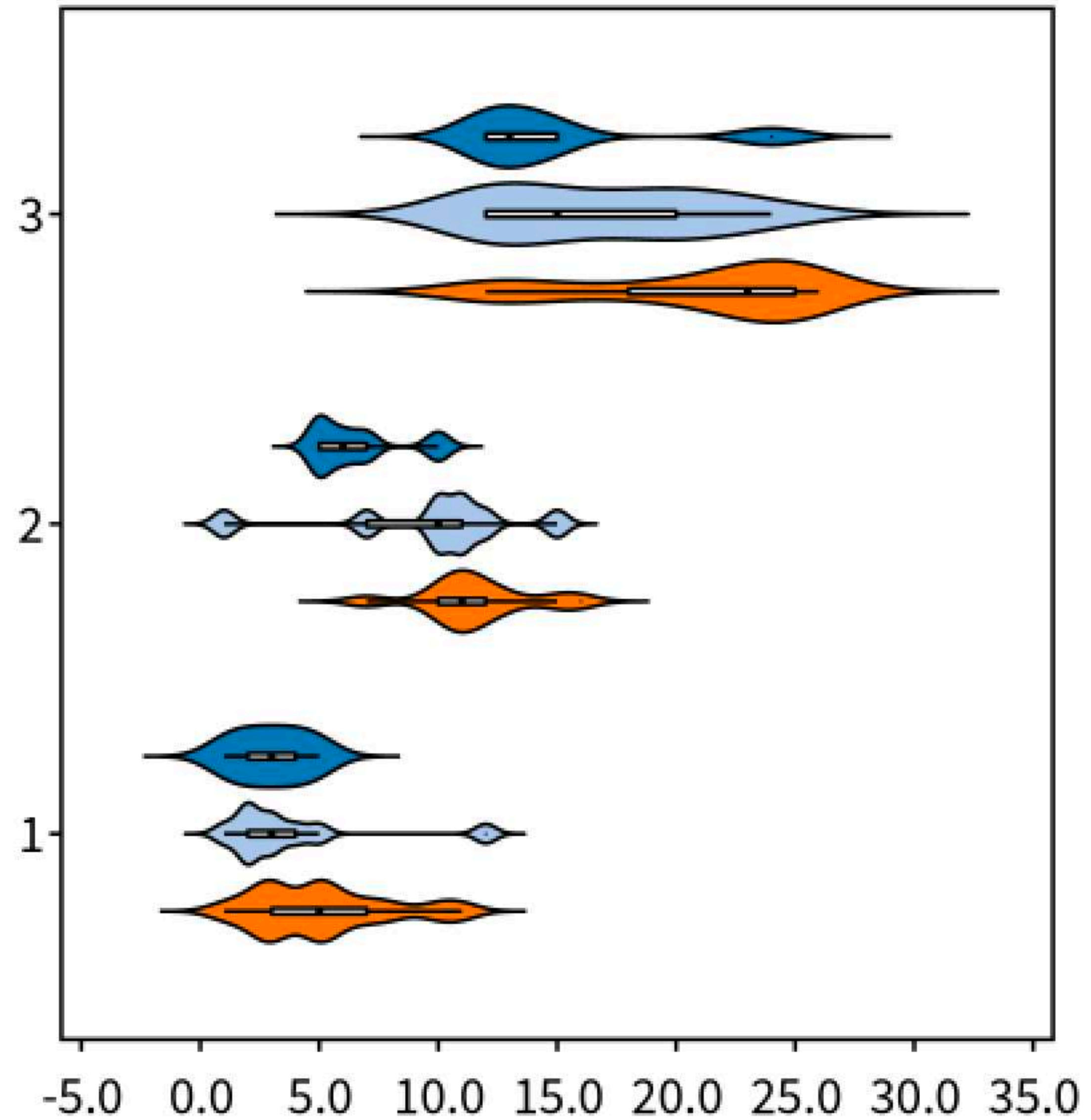
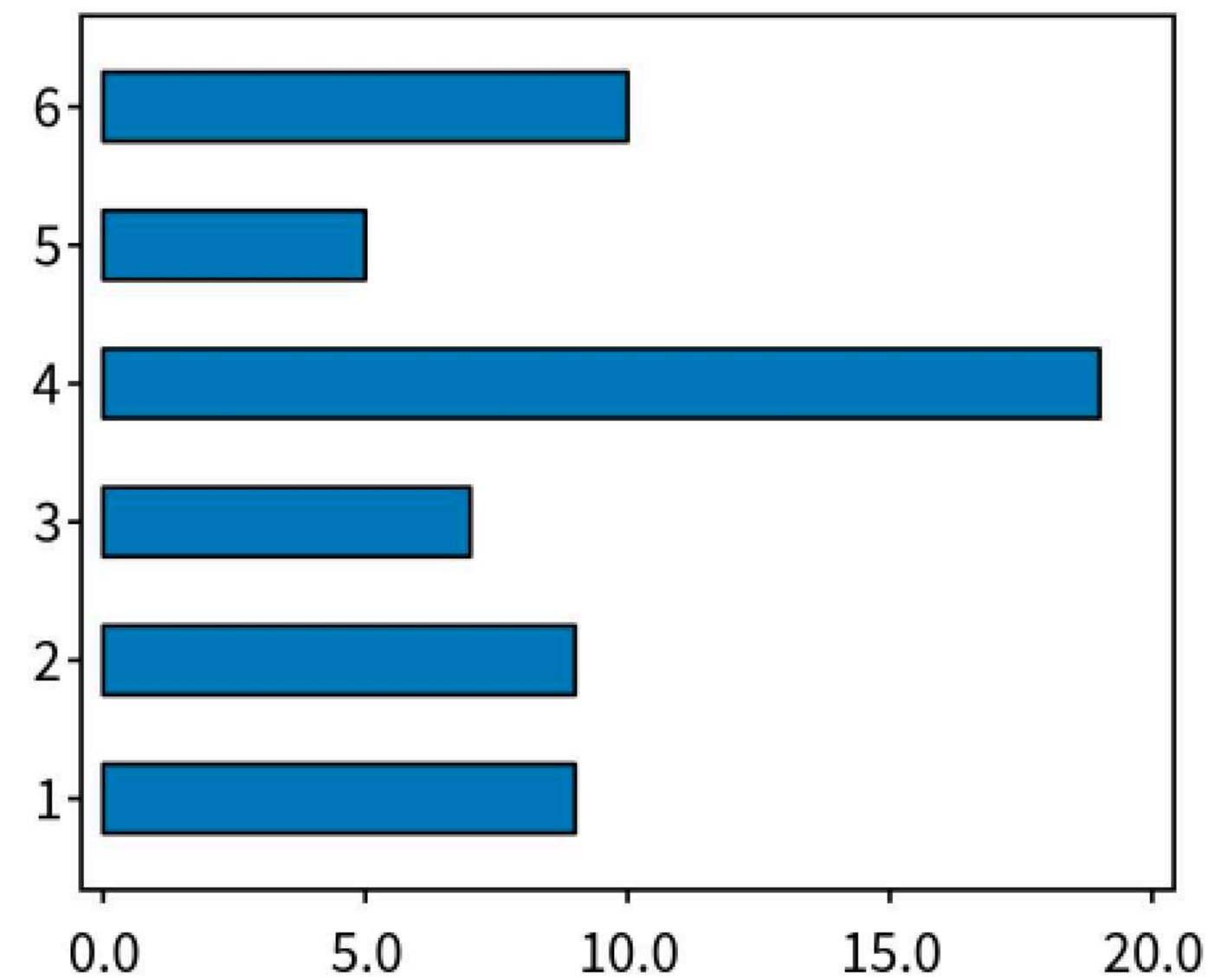
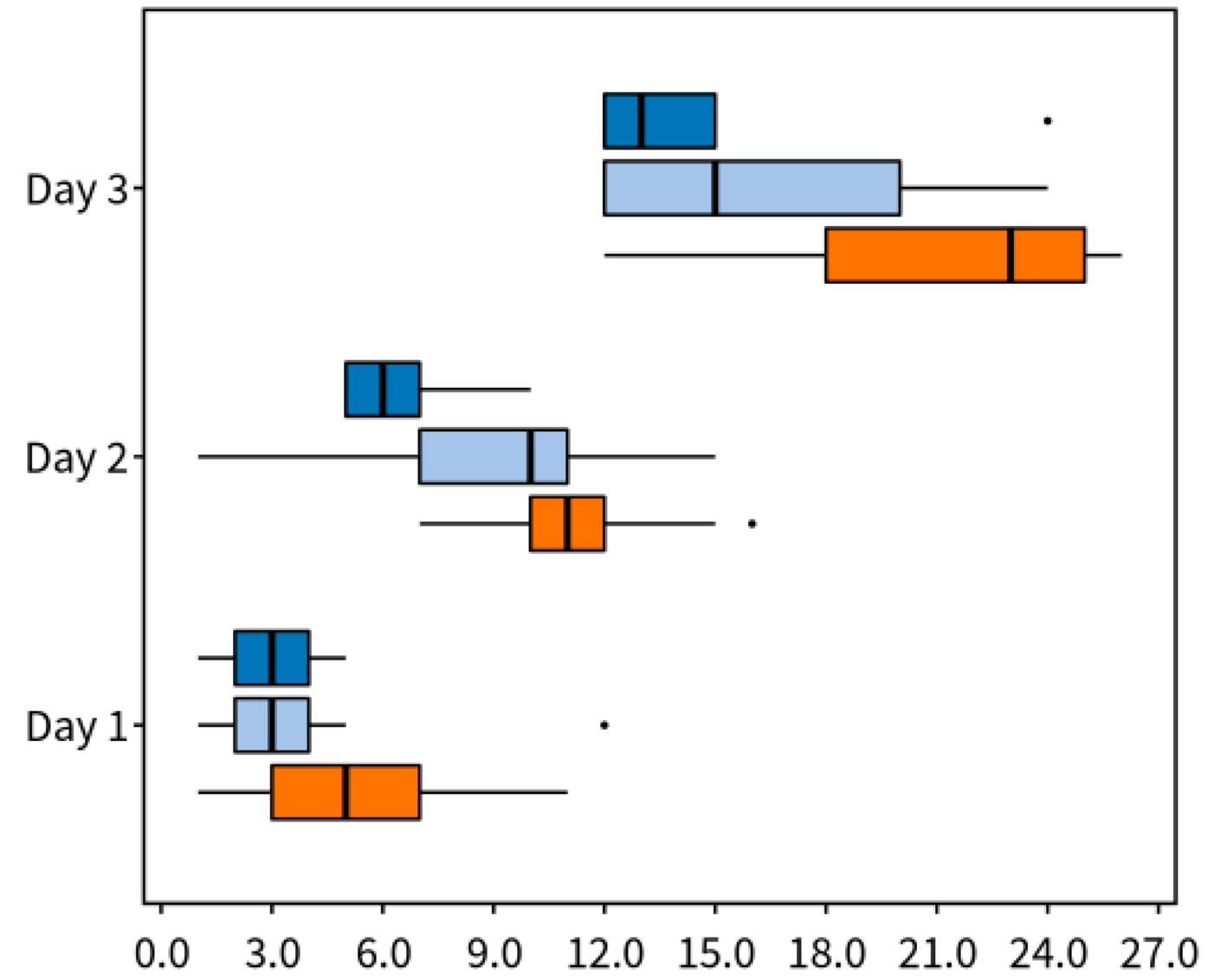
Cluster plot

```
1 | p1 p2 chart data1 data2 x |  
2 data1 := { 10. 9. 7 }. "blue"  
3 data2 := { 20. 15. 8 }. "orange"  
4 x := { 1. 2. 3. }.  
5 p1 := RSBarPlot data: data1.  
6 p2 := RSBarPlot data: data2.  
7 chart := p1 + p2.  
8 ^ chart open. |
```

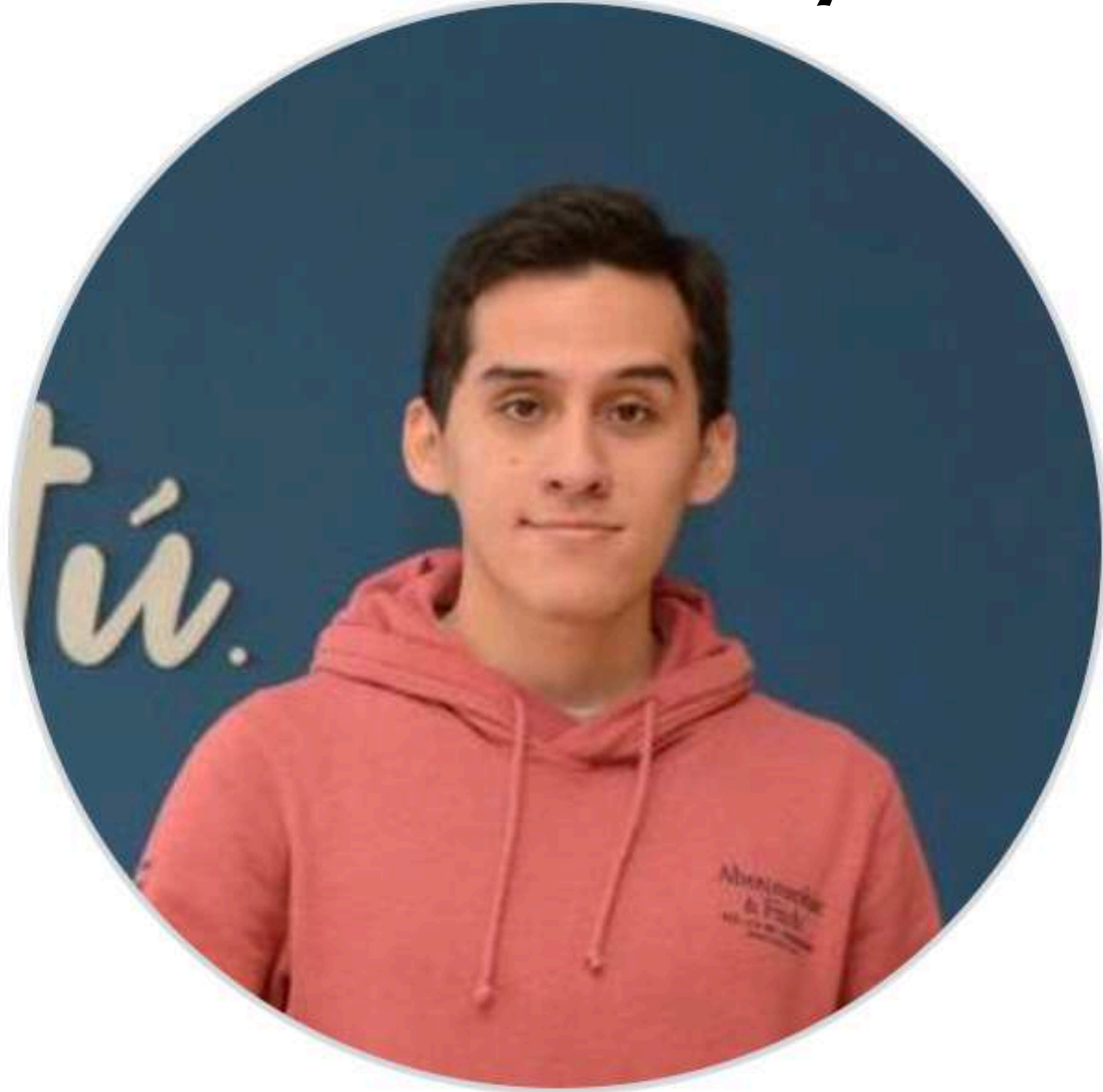
Cluster plot



Horizontal plots



Many thanks to Kevin and Pol



Kevin Cespedes Arancibia

kevca87 · he/him



DurieuxPol

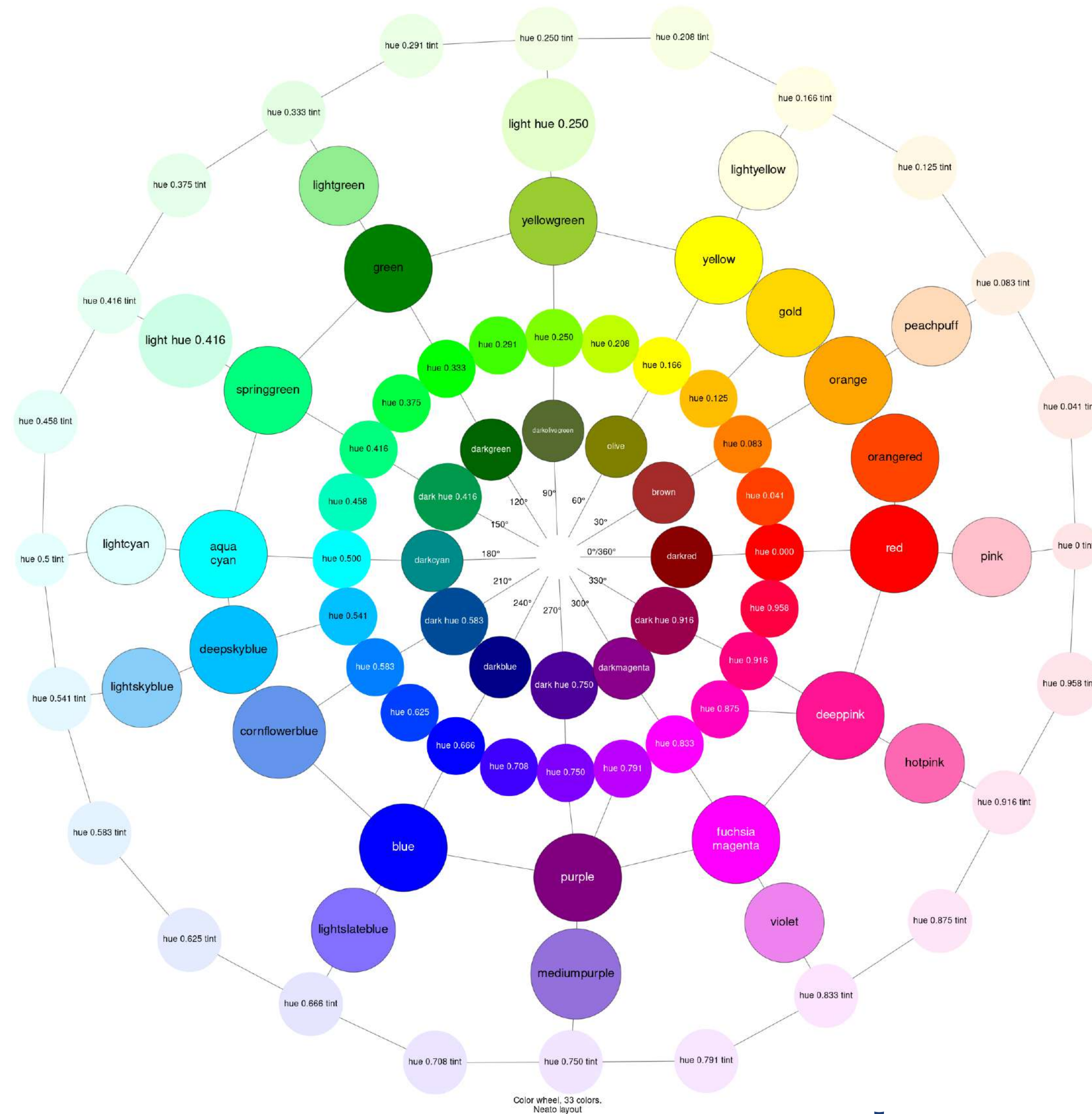


Google Summer of Code

Layouts

More documentation

- More class comments
- More examples



<https://graphviz.org/>

Layout studio

Layout Studio on: RSCircleLayout

Change Layout Browse Generate

Graph editor

```
1 "canvas is an instance of  
RSCanvas use it to render a  
graph"  
2 RSLayoutStudio renderGraphIn:  
canvas
```

Initial Angle (in degrees)
0.0

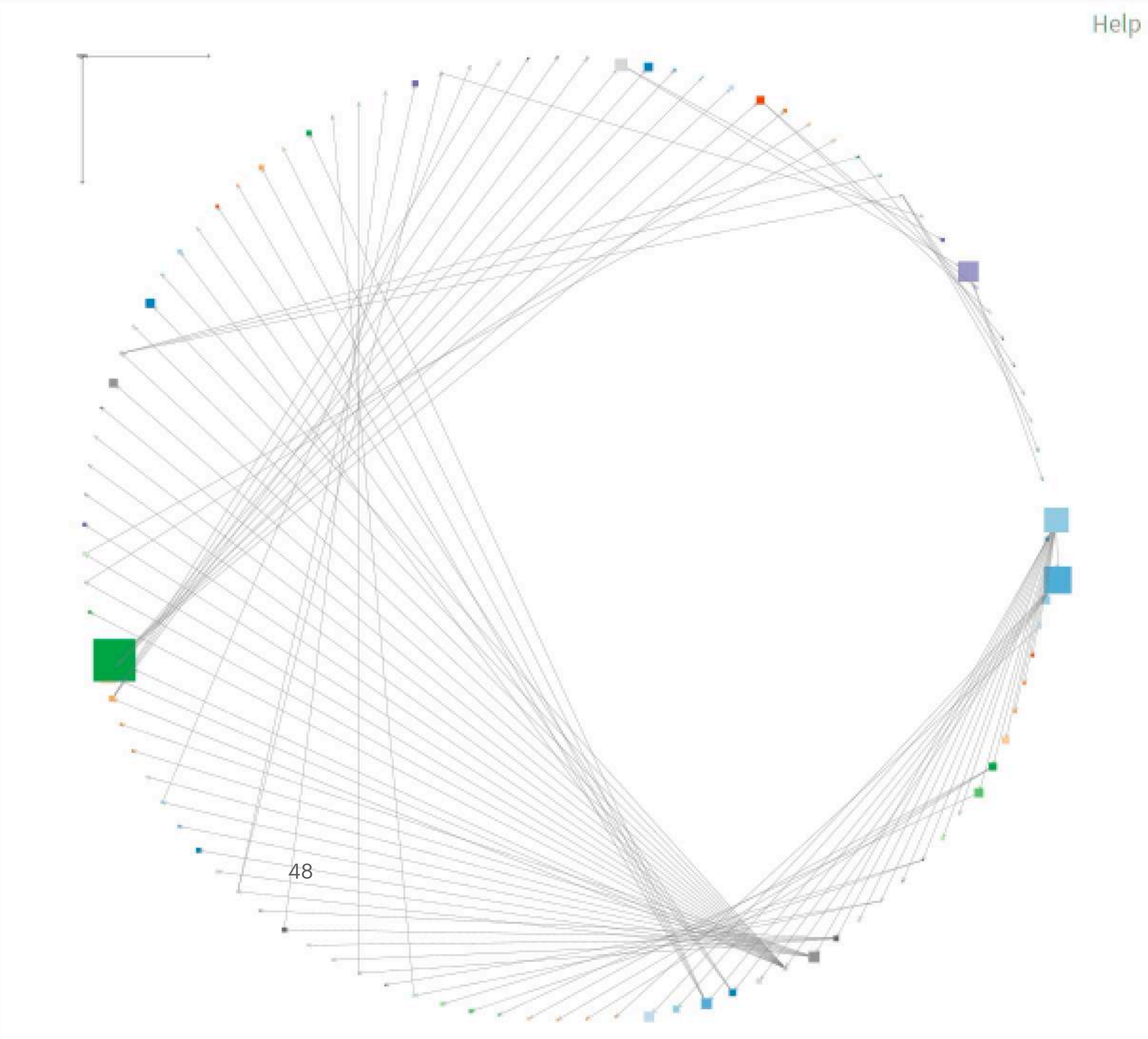
Increment Angle (in degrees)
0.0

Initial Radius
0

Scale Factor
11

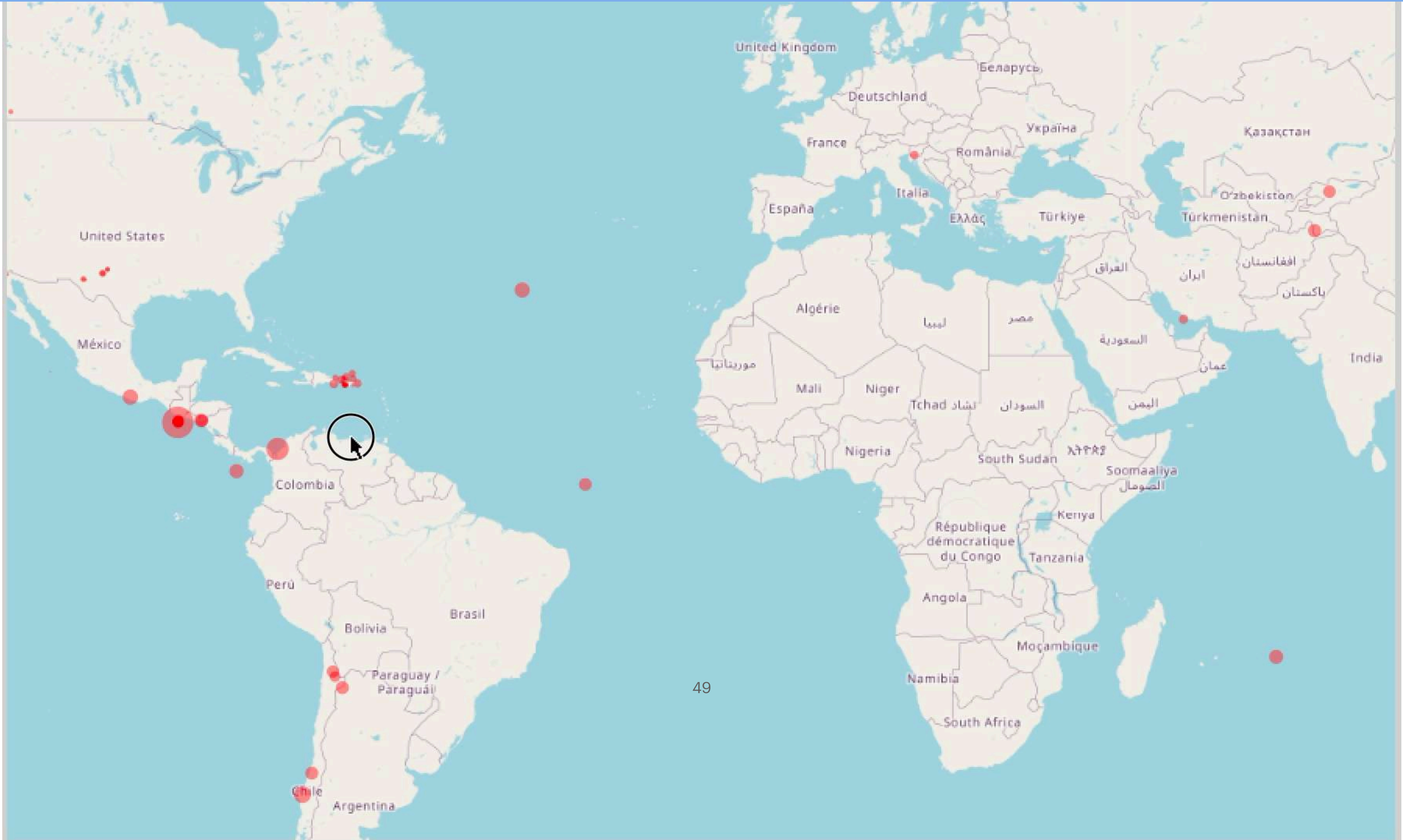
Central Point
nil

Help



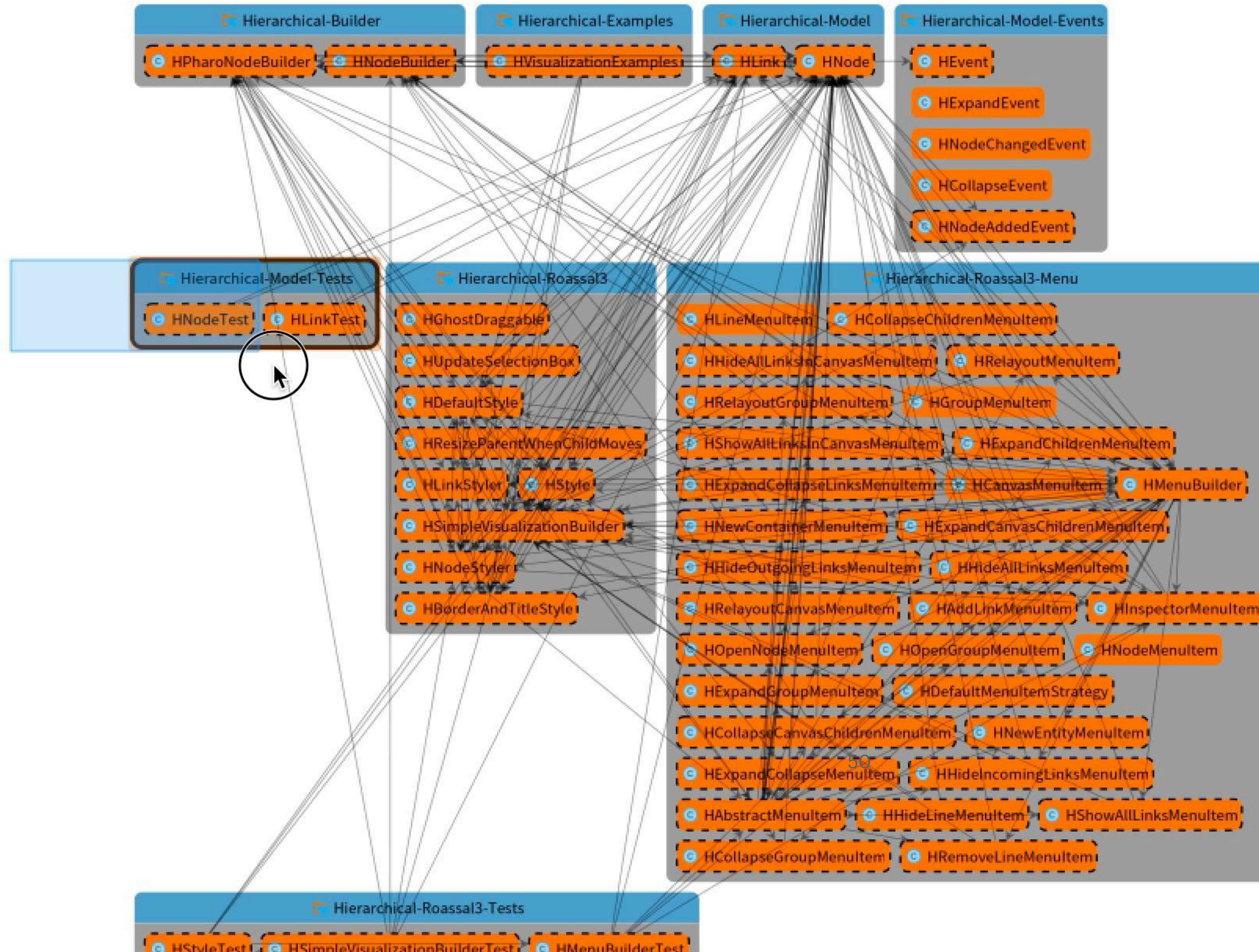
48

Open Street Maps(OSM)



Selection in Roassal

Hierarchical Visualization-Root



Roassal + Bloc

blocjul.image

Pharo Browse Debug Sources System Library Windows Help

```
Playground
Do it Publish Bindings Versions Pages
1 | chart p1 p2 p3 y1 y2 y3 |
2
3 y1 := { { 1. 2. 3. 4. 5. } .
4         { 5. 6. 7. 5. 10. } .
5         { 12. 12. 13. 14. 15. 24. } }.
6
7 y2 := { { 1. 2. 2. 2. 3. 4. 3. 5. 12. } .
8         { 1. 12. 7. 10. 11. 11. 15. 10. } .
9         { 12. 12. 13. 15. 18. 20. 21. 24. } }.
10
11 y3 := { { 1. 2. 3. 3. 3. 5. 3. 5. 5. 7. 8. 5. 6. 10. 11. } .
12         { 12. 7. 10. 11. 11. 13. 10. 11. 12. 11. 15. 16. } .
13         { 12. 12. 13. 15. 18. 20. 21. 24. 25. 24. 25. 26. 24. 23. 23. 25. 25. } }.
14
15 p1 := RSViolinPlot data: y1. "blue"
16 p2 := RSViolinPlot data: y2. "sky blue"
17 p3 := RSViolinPlot data: y3. "orange"
18 chart := p1 + p2 + p3.
19 chart xTickLabels: { 'Day 1'. 'Day 2'. 'Day 3' }.
20 chart container useBlocHost.
21 ^ chart open
22 extent: 1280@720
```

51

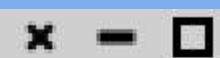
Line: 14:1

+L

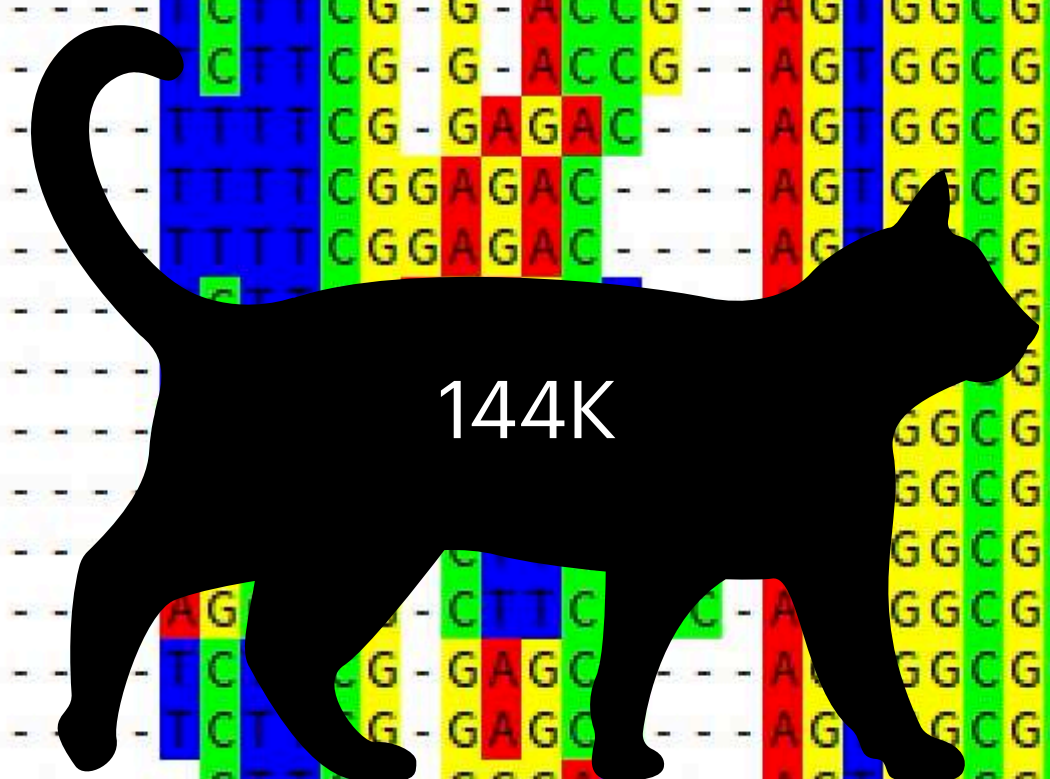
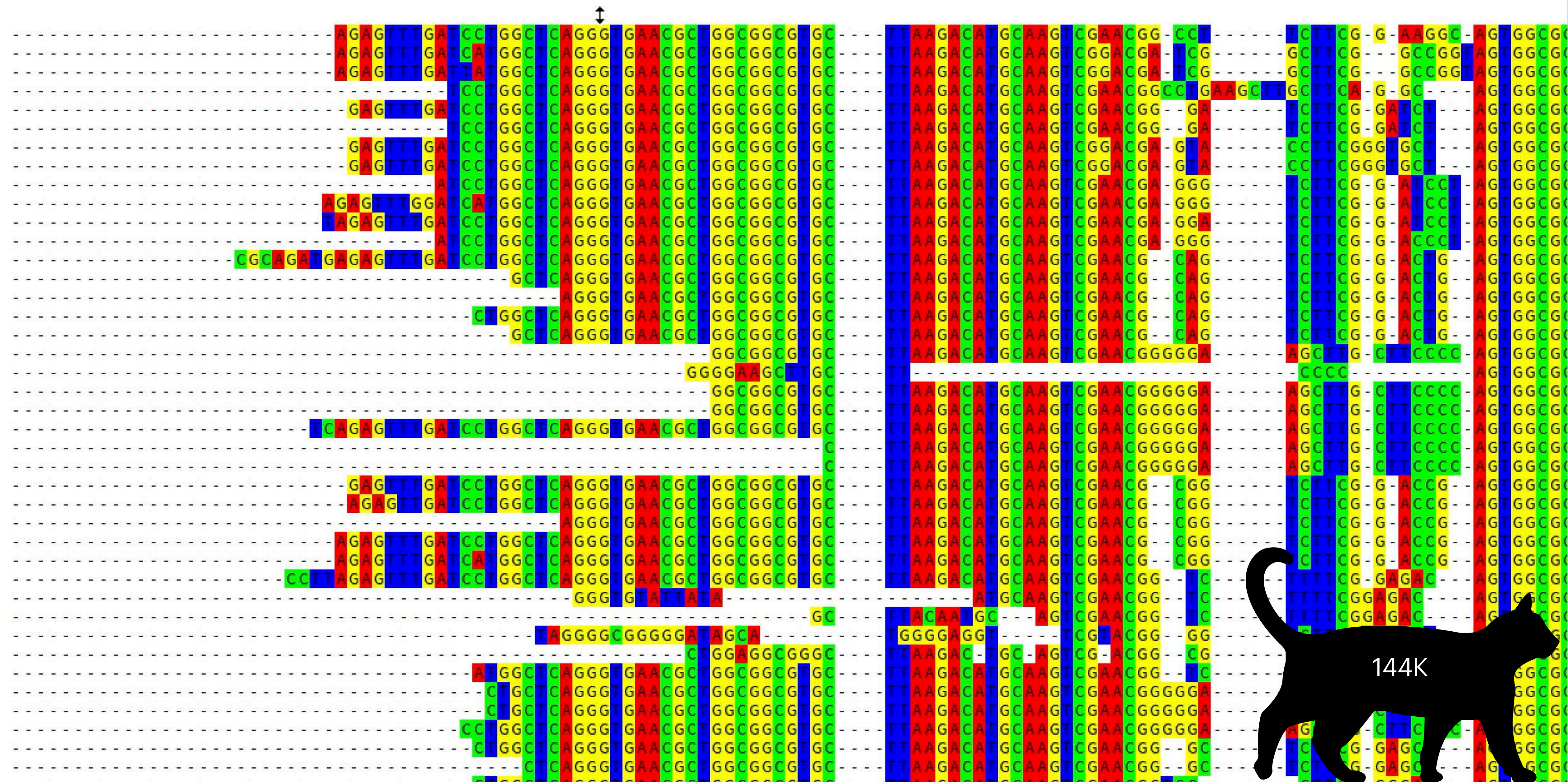
A surreal landscape with a starry blue sky, a large blue moon, and a body of water reflecting the scene. The scene is dominated by blue and purple tones. In the foreground, a calm body of water reflects the sky and the moon. The middle ground shows a dark, silhouetted landscape with trees and a bridge-like structure. The background is a vast, starry sky with a large, glowing blue moon on the right side. The overall atmosphere is dreamlike and ethereal.

Escalation problem

The Problem

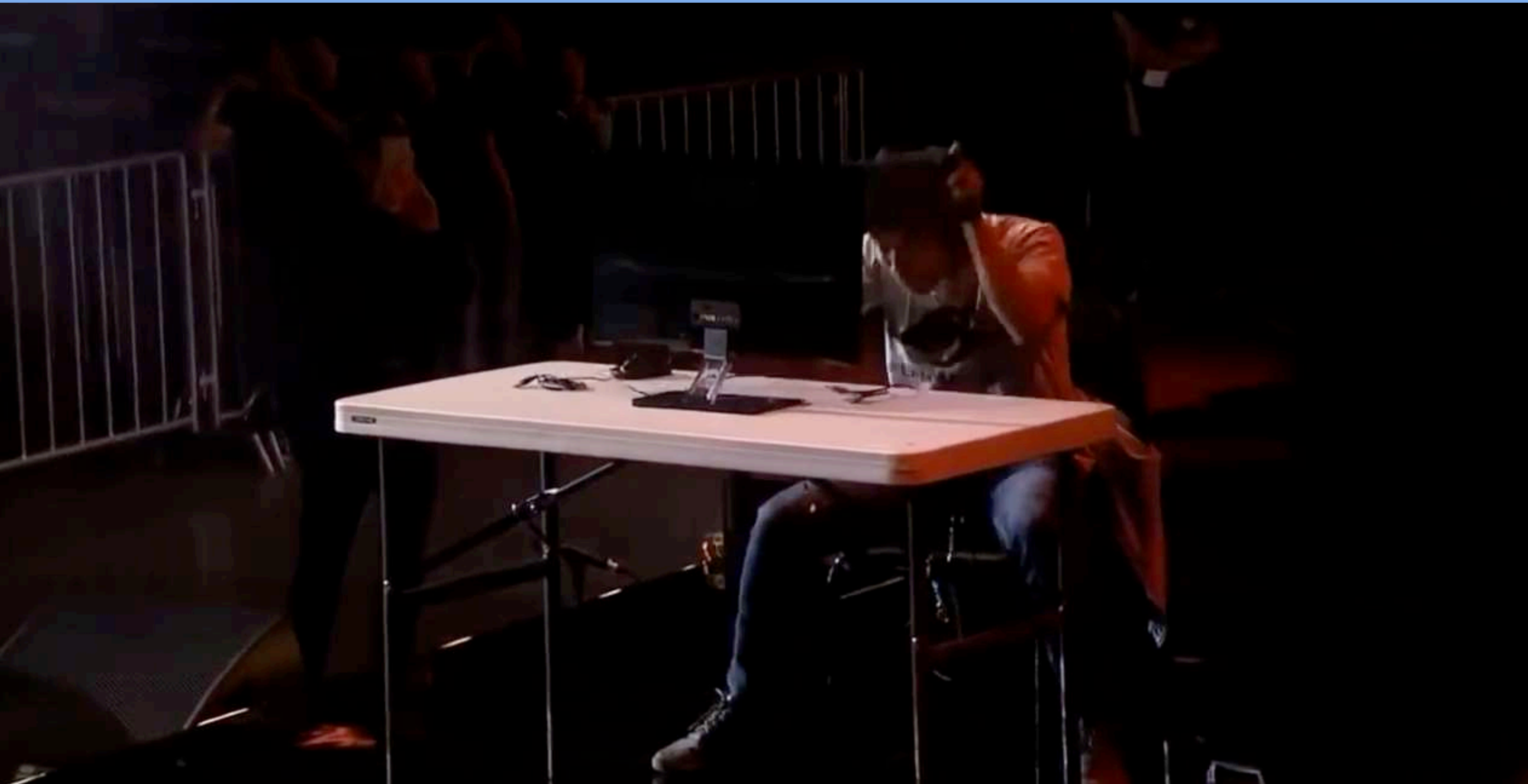


Roassal



144K

The Problem

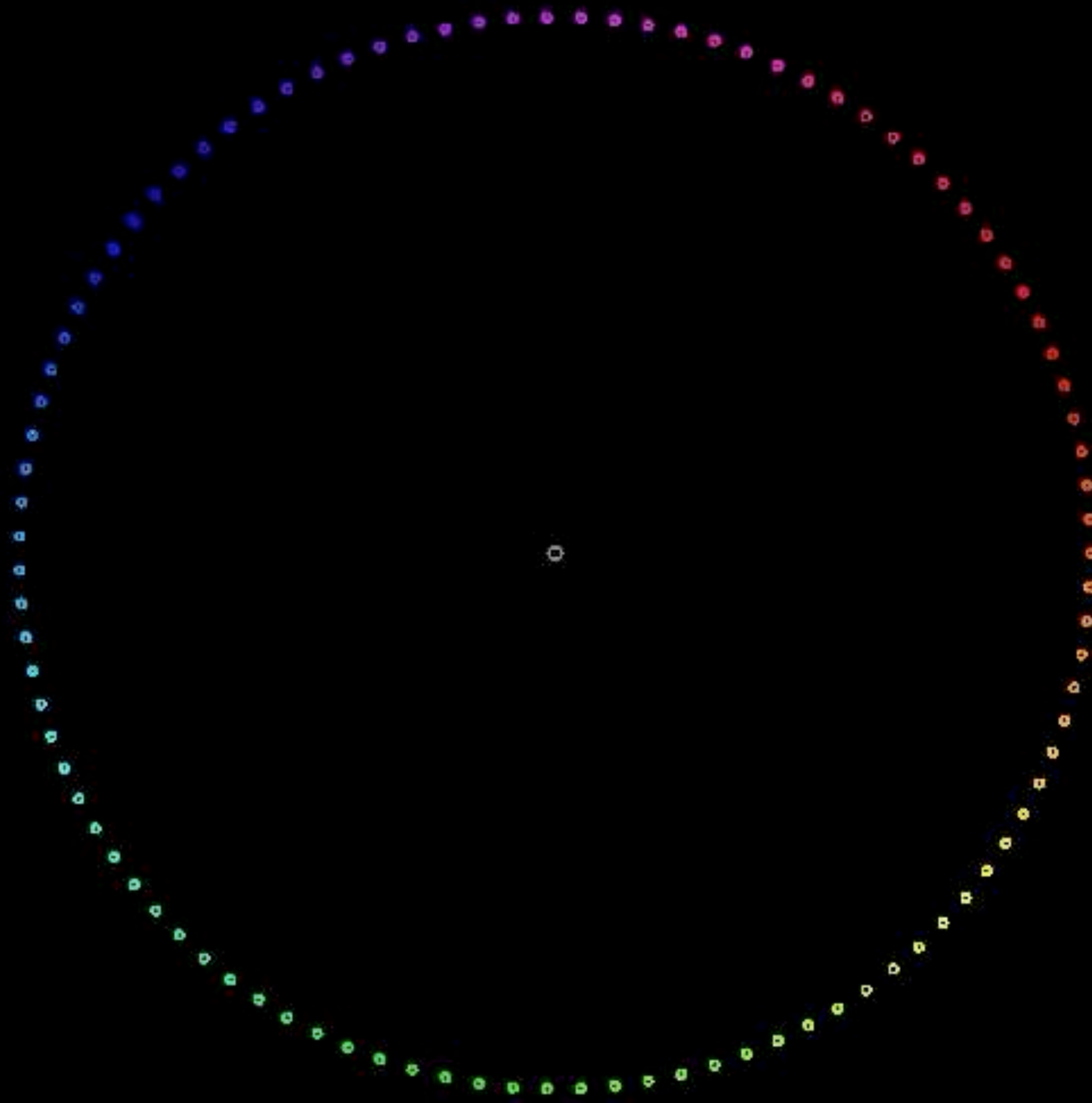


Why?



**Since I was a kid, my
biggest dream has been to
have more FPS in Roassal**

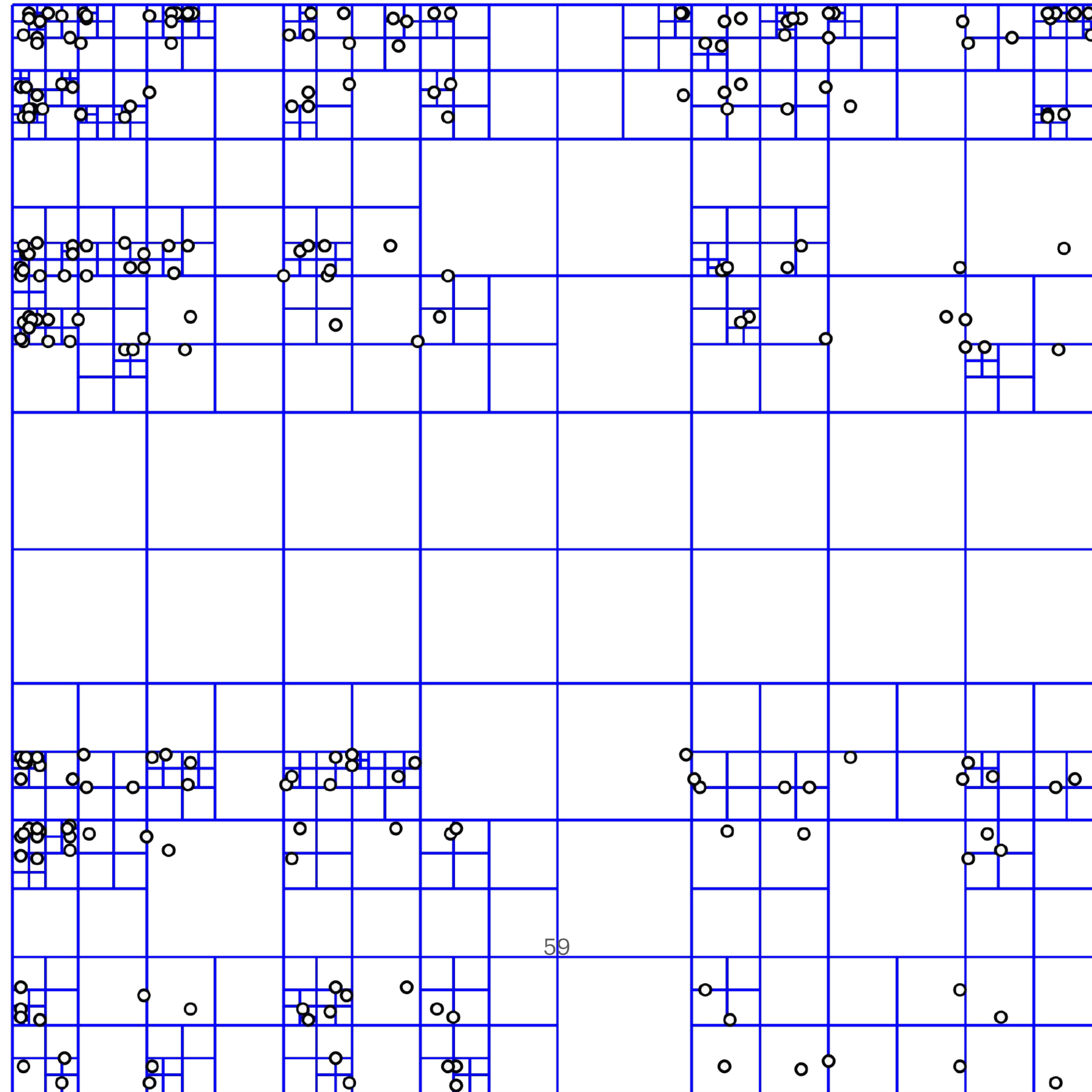
So I put some **RGB** in Roassal



Trees



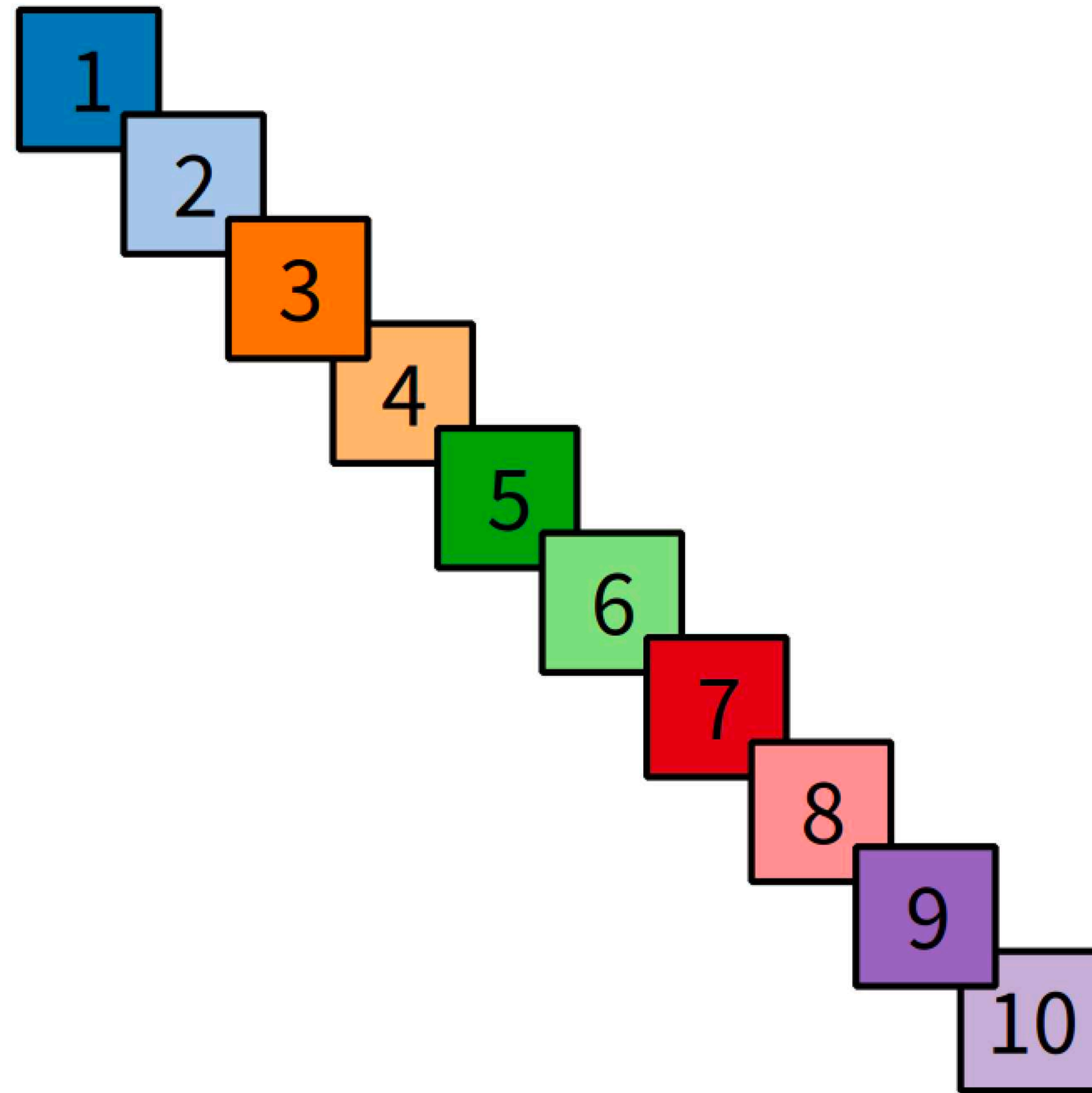
Quad Tree



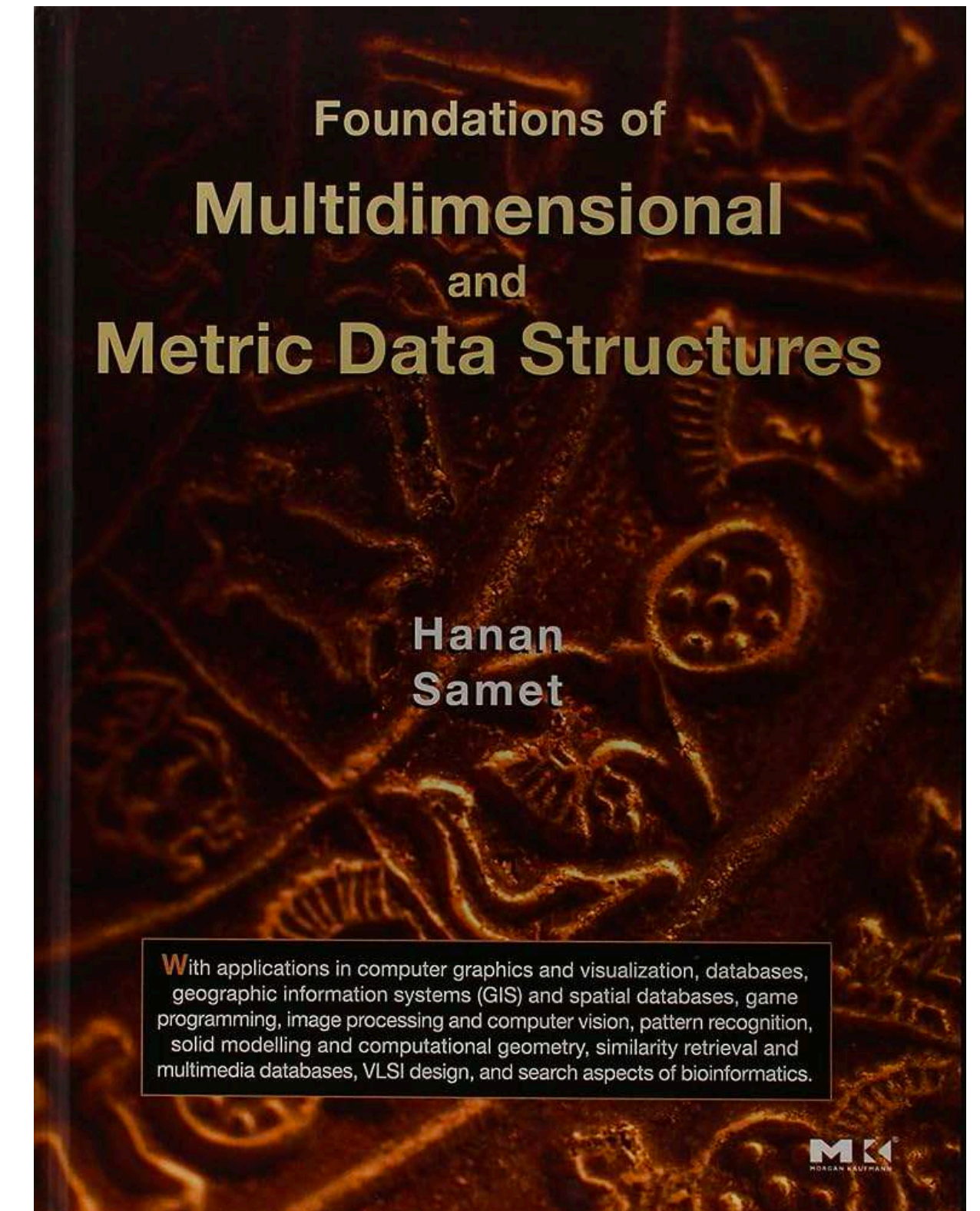
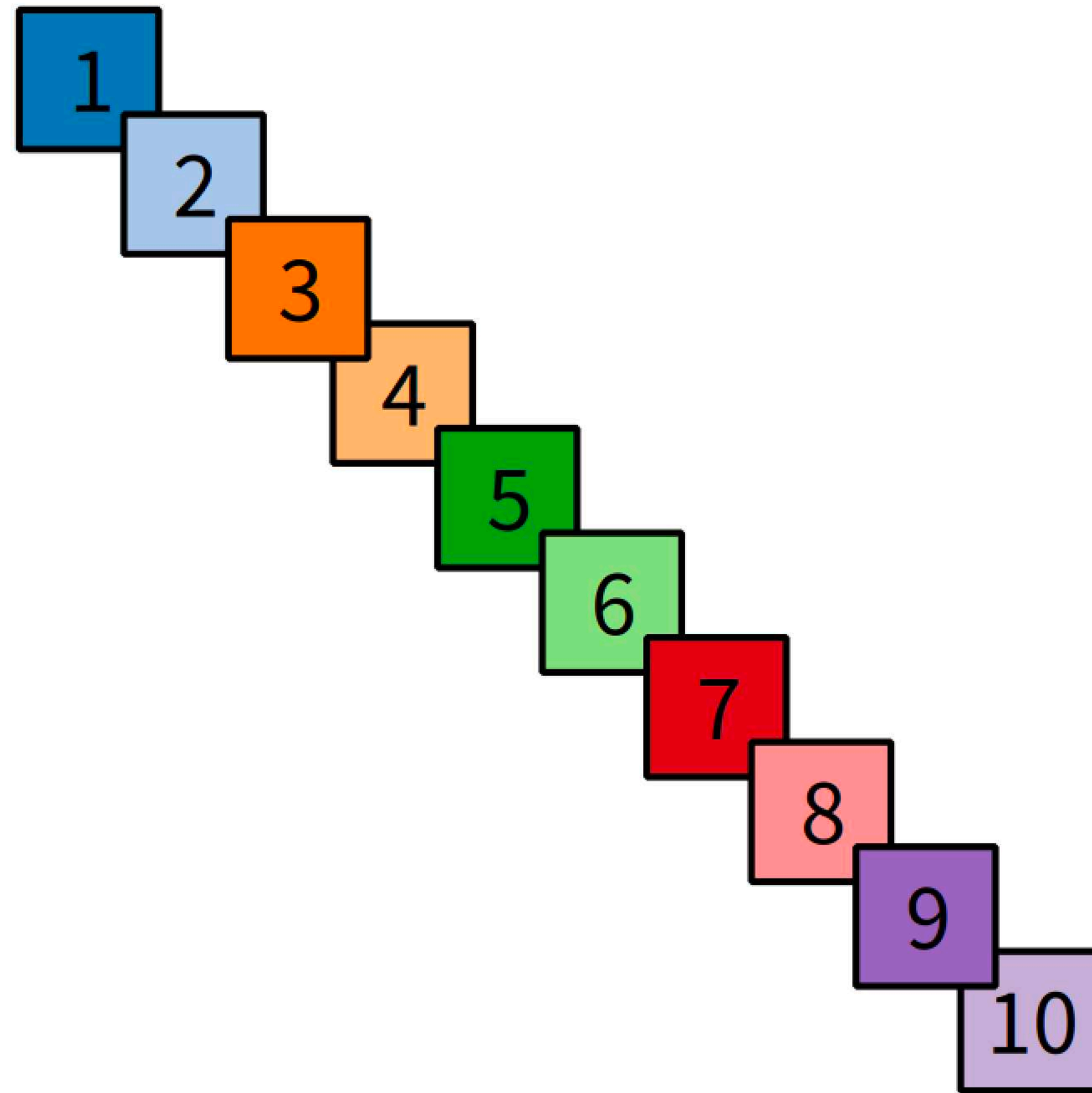
Quad Tree



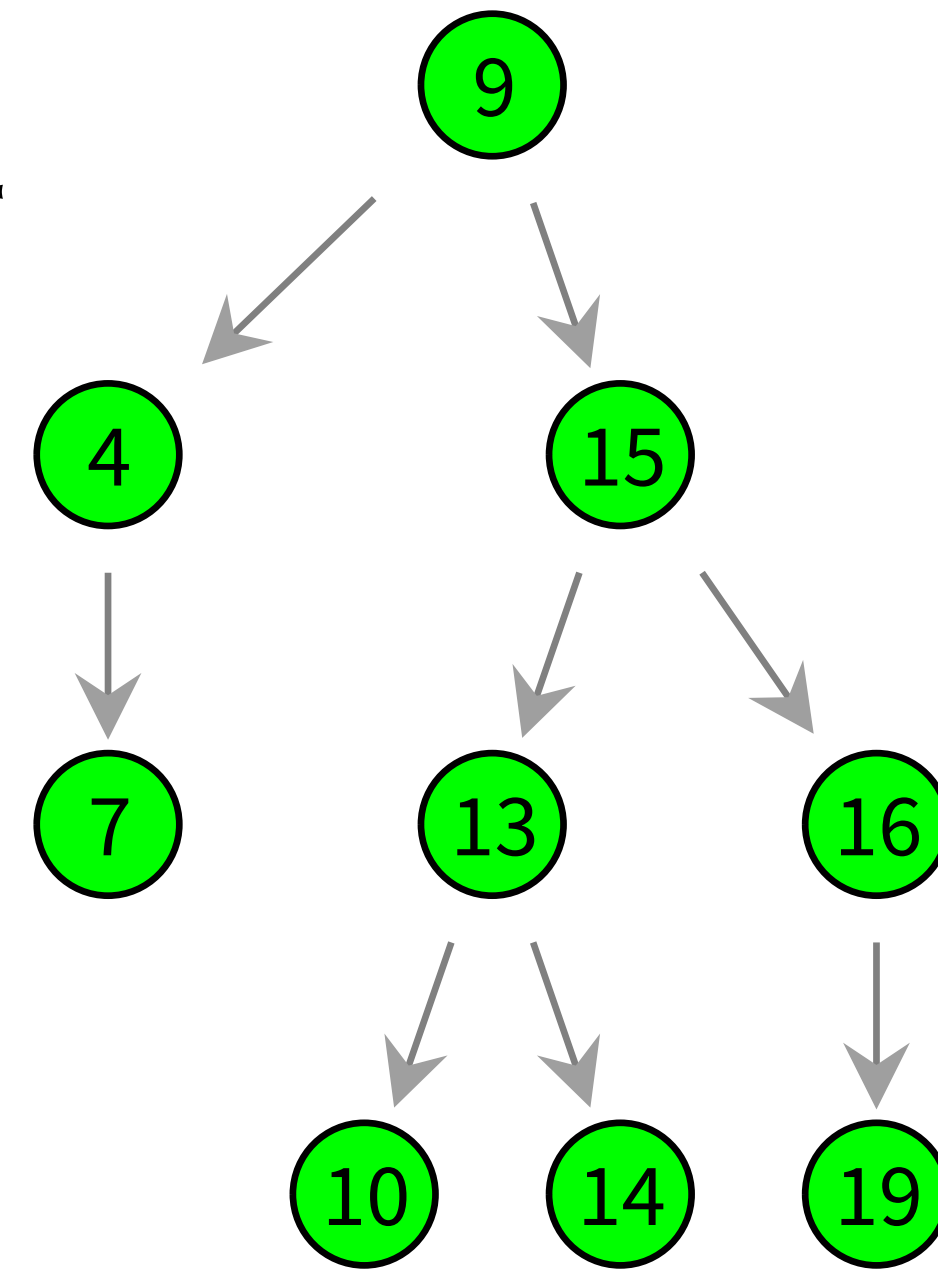
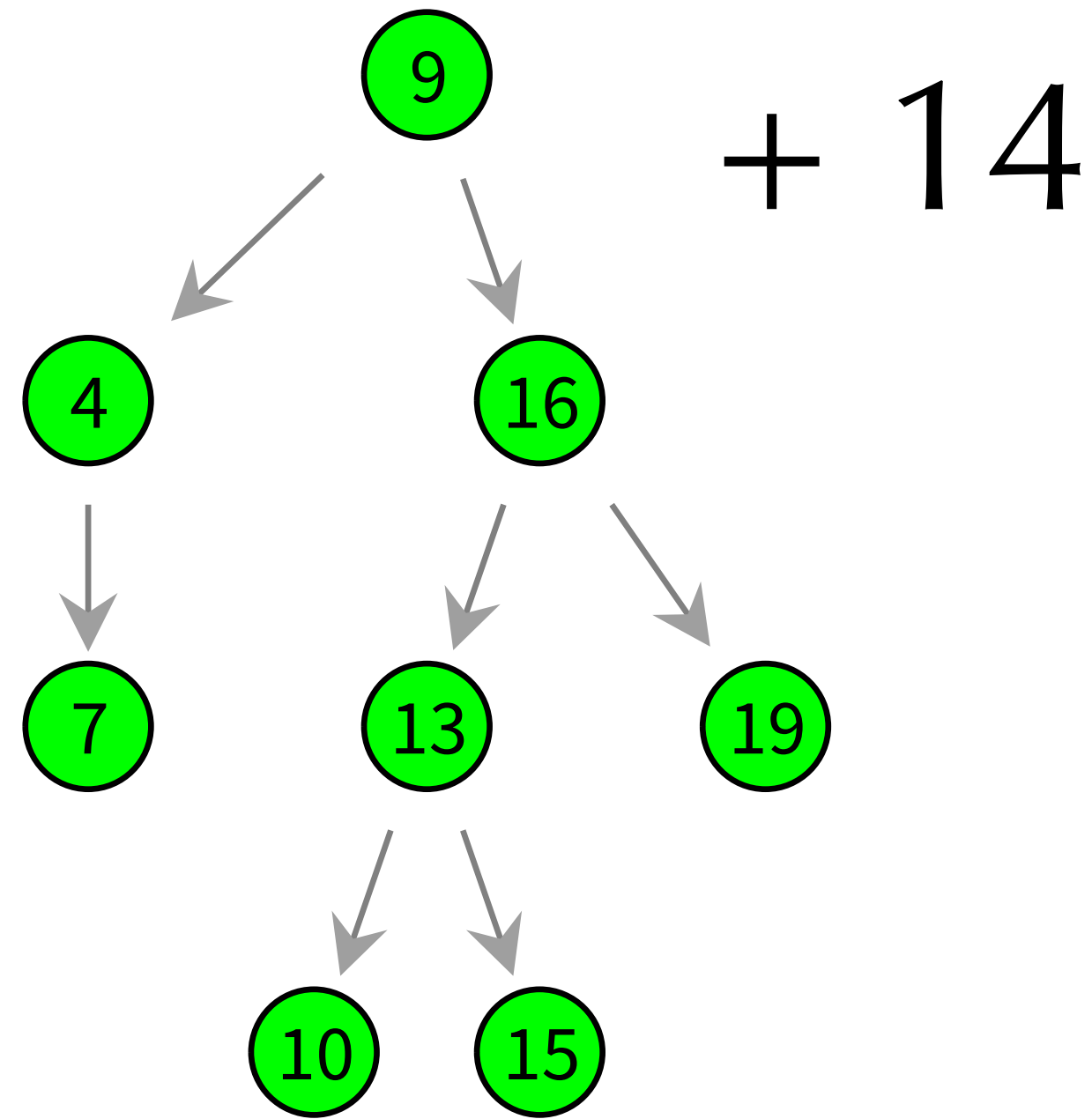
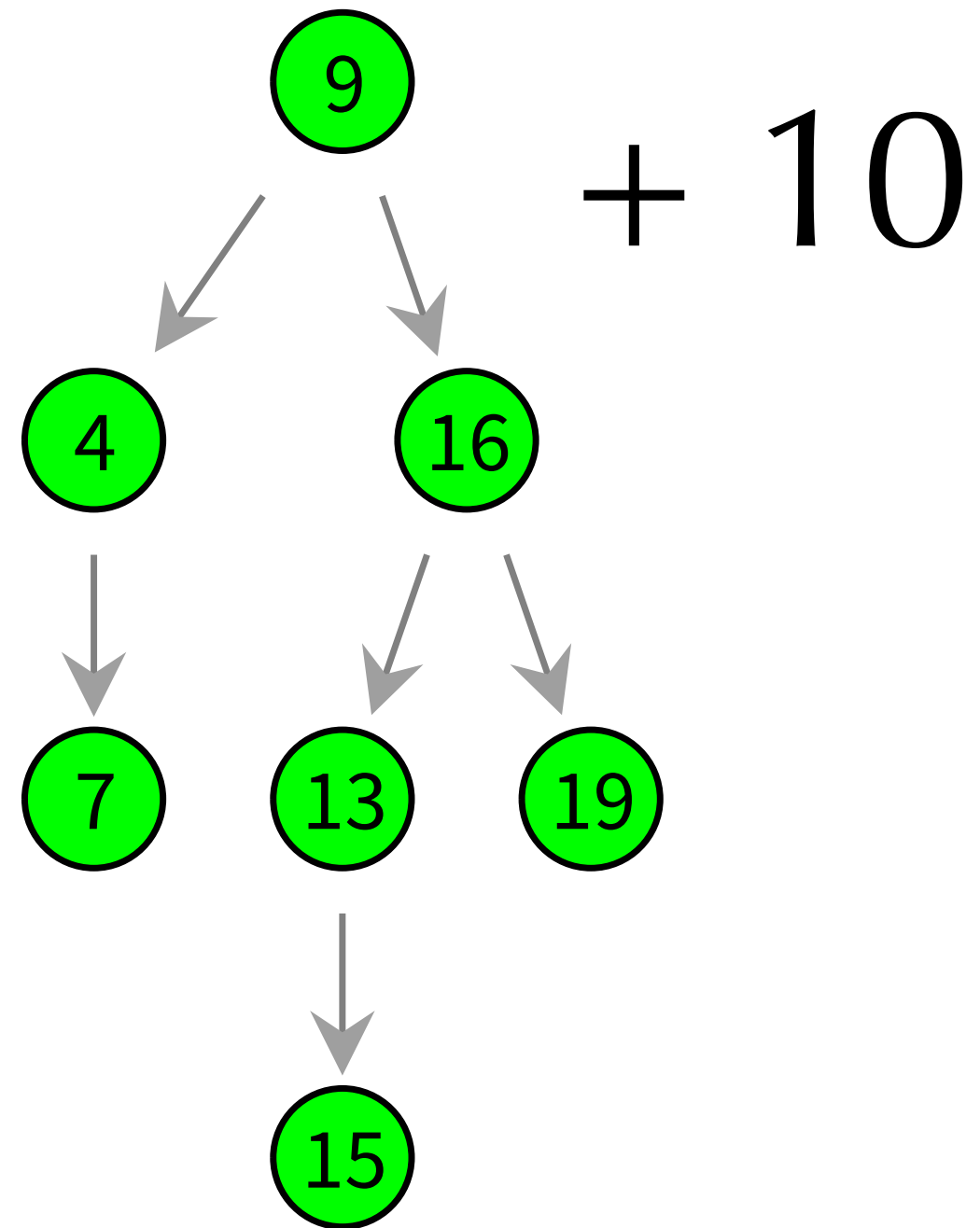
The Problem: Overlapping



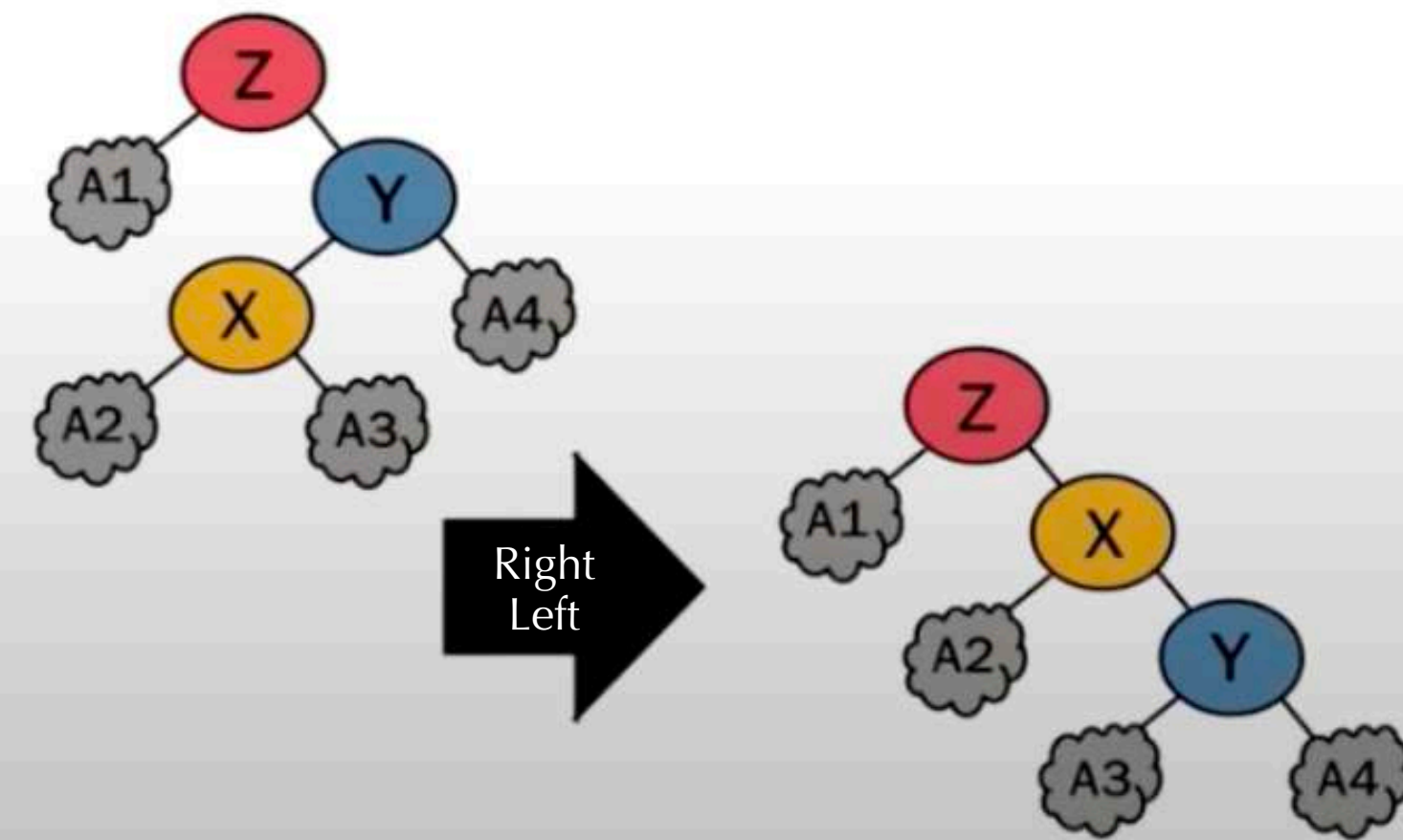
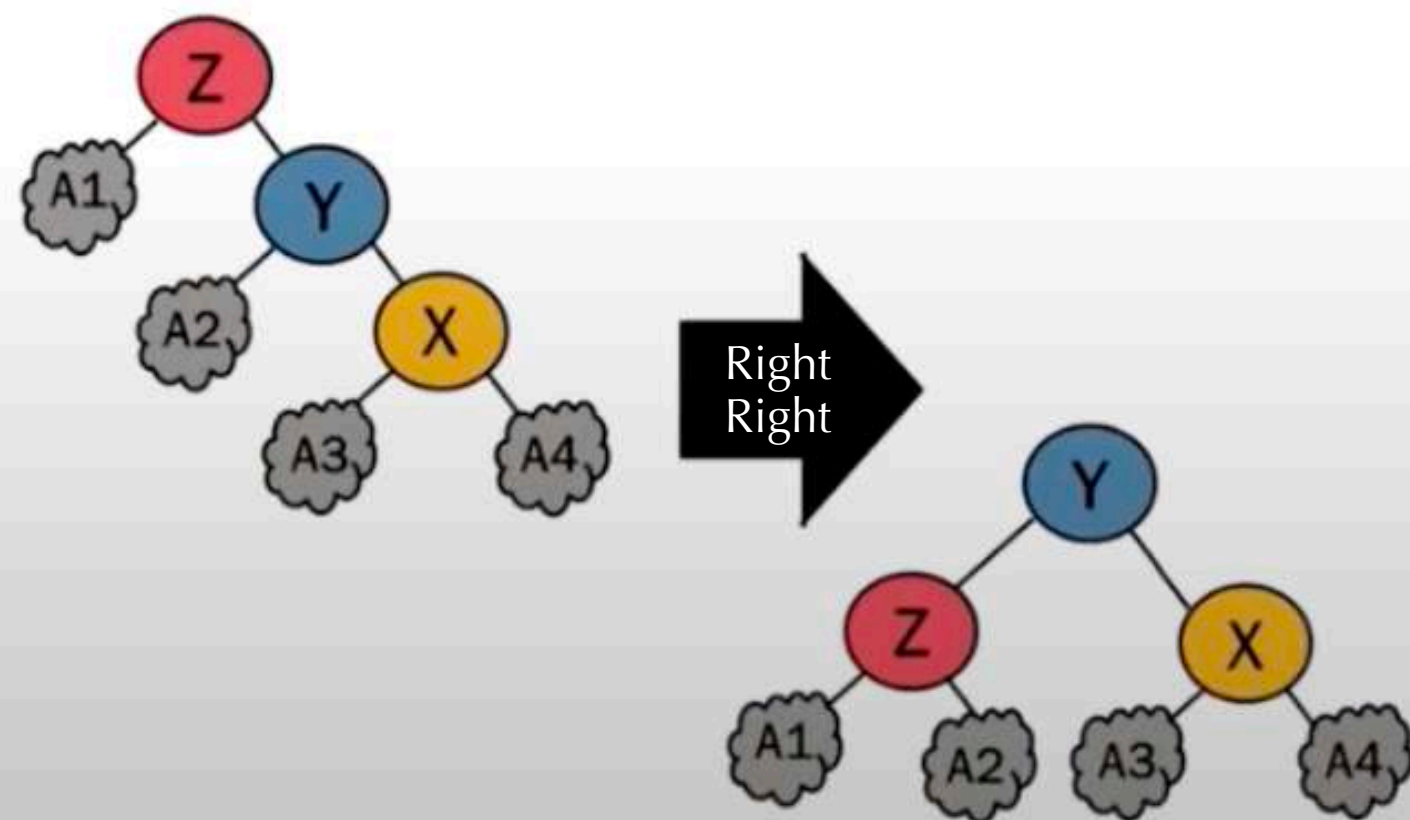
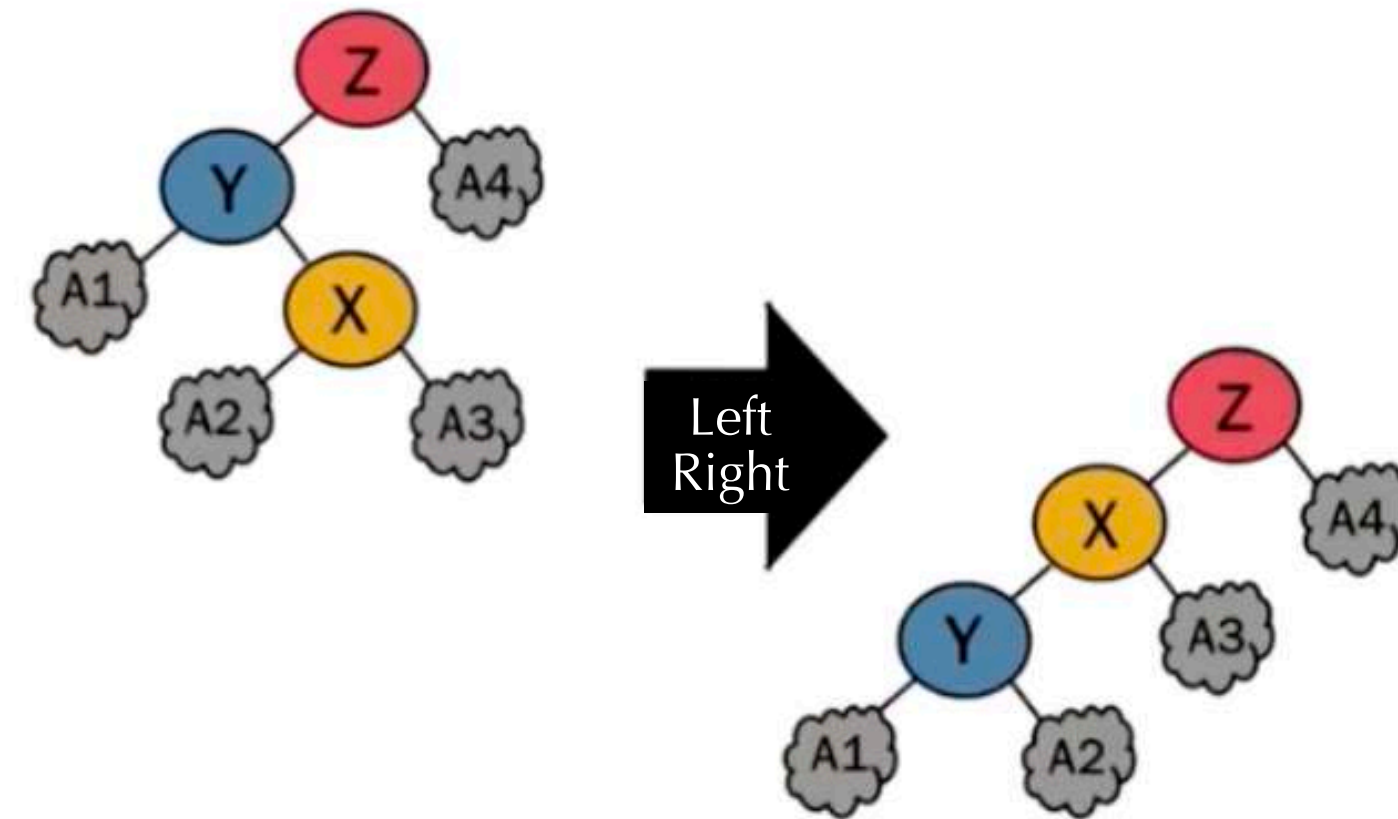
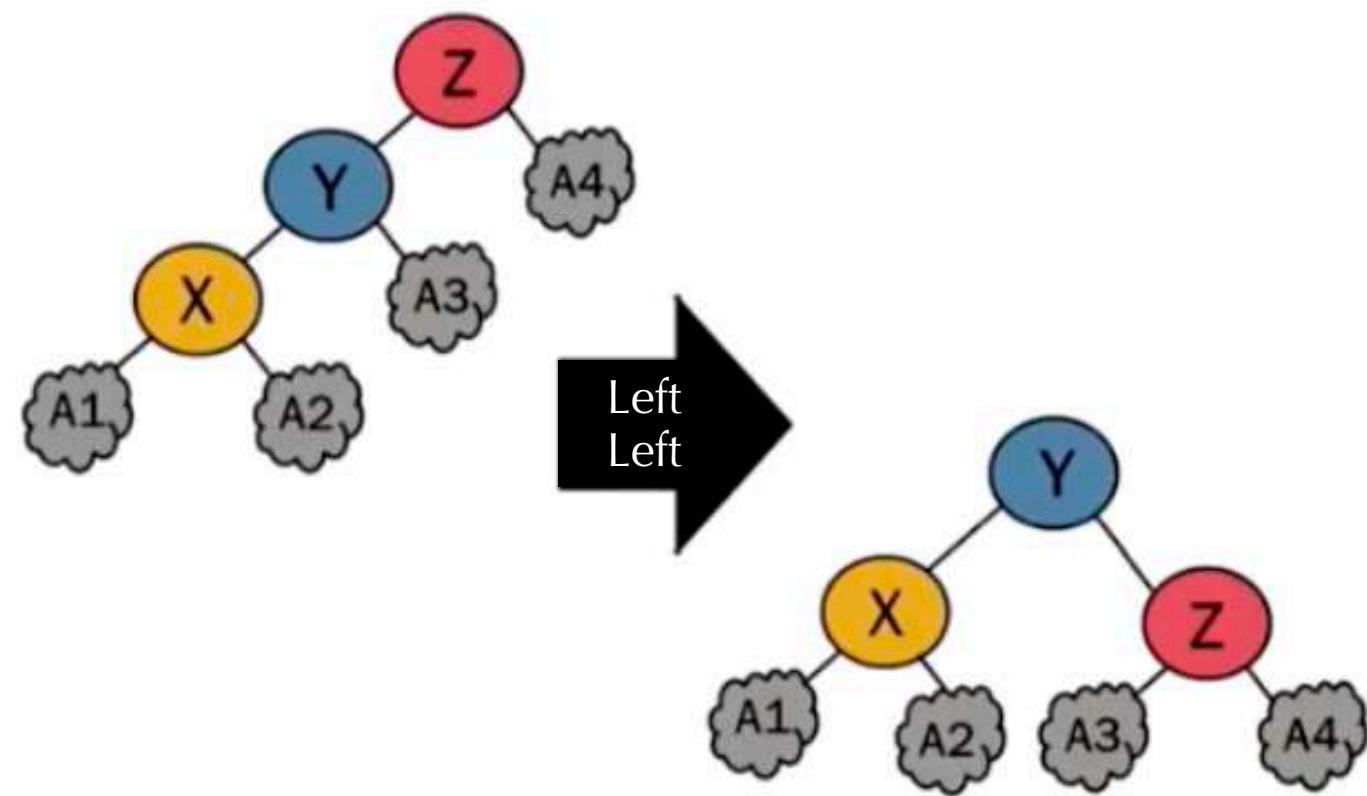
The Problem: Overlapping



AVL



Rotations

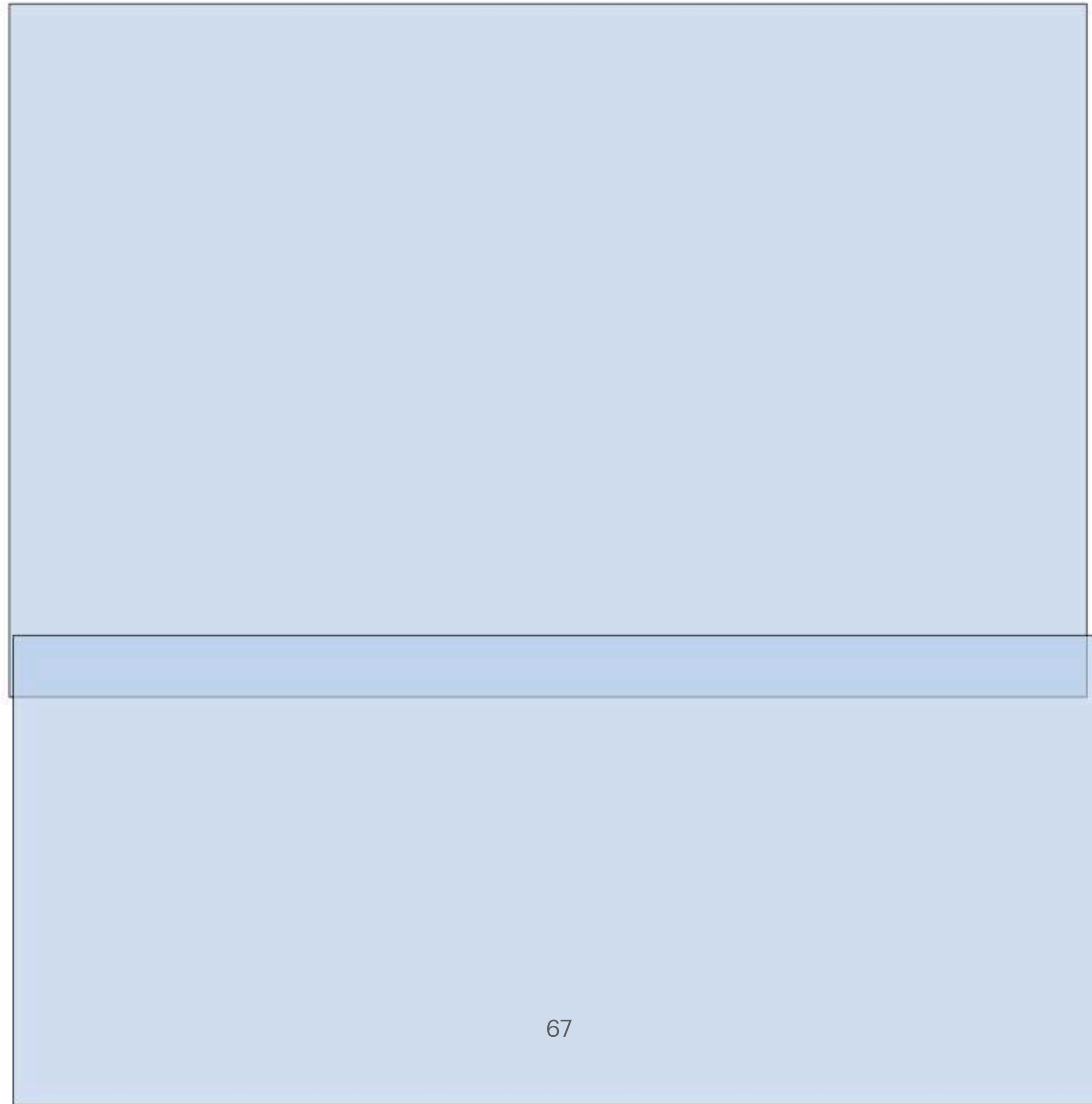


RTree in Roassal

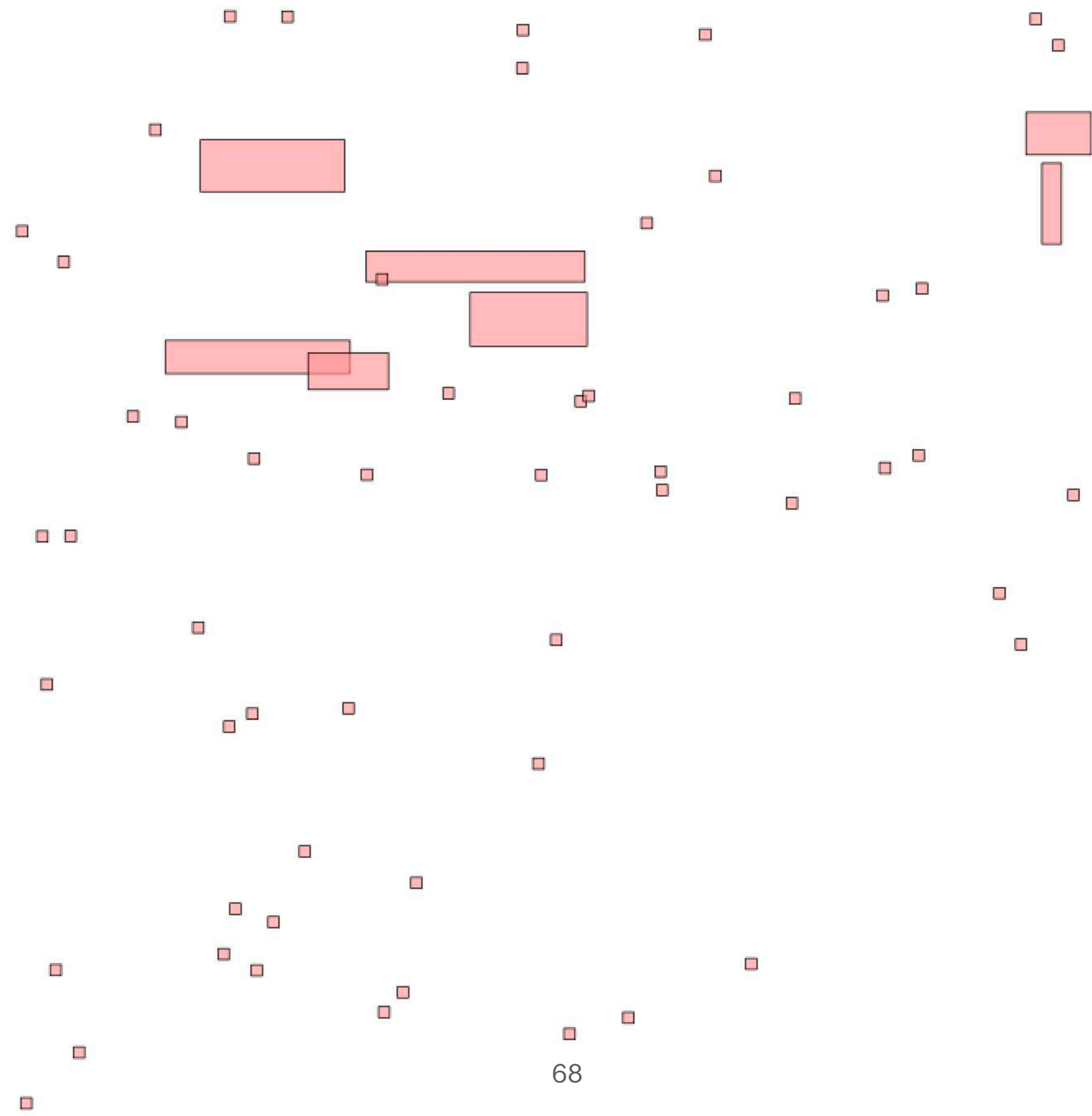


RTree in Roassal

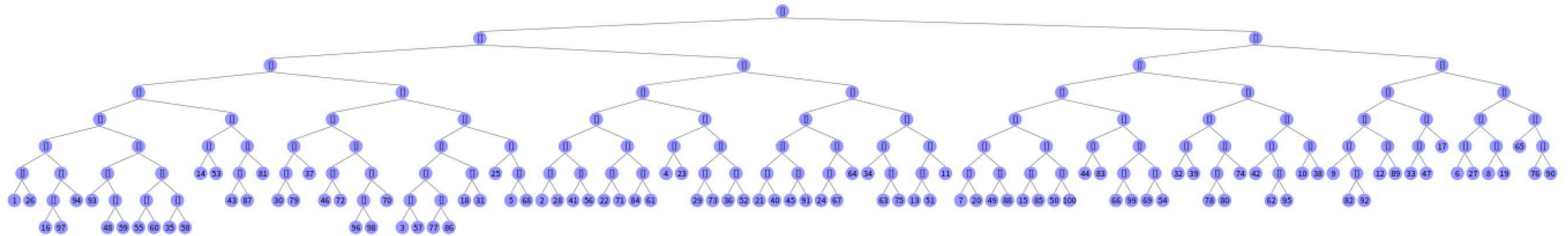
RTree in Roassal



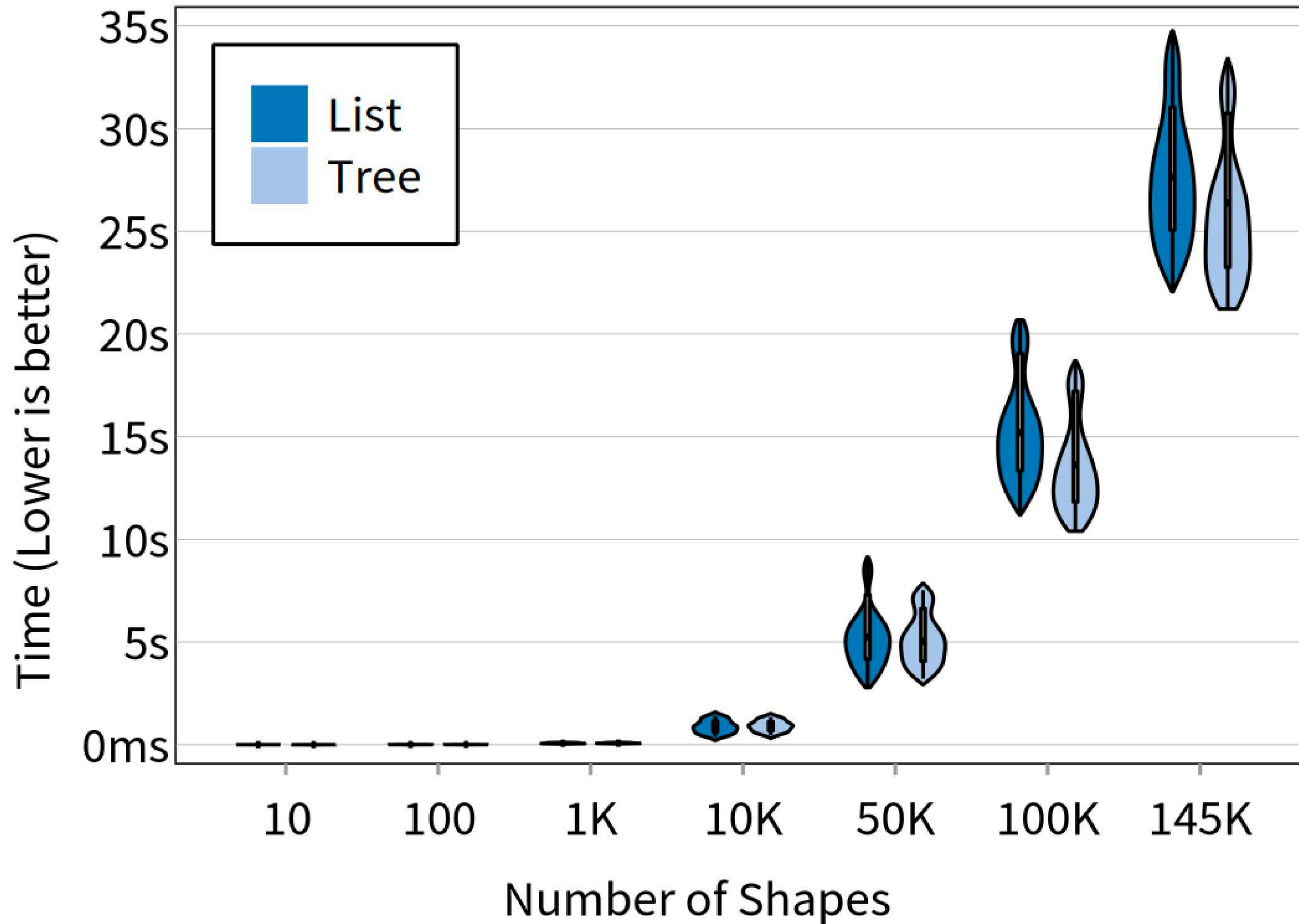
RTree in Roassal



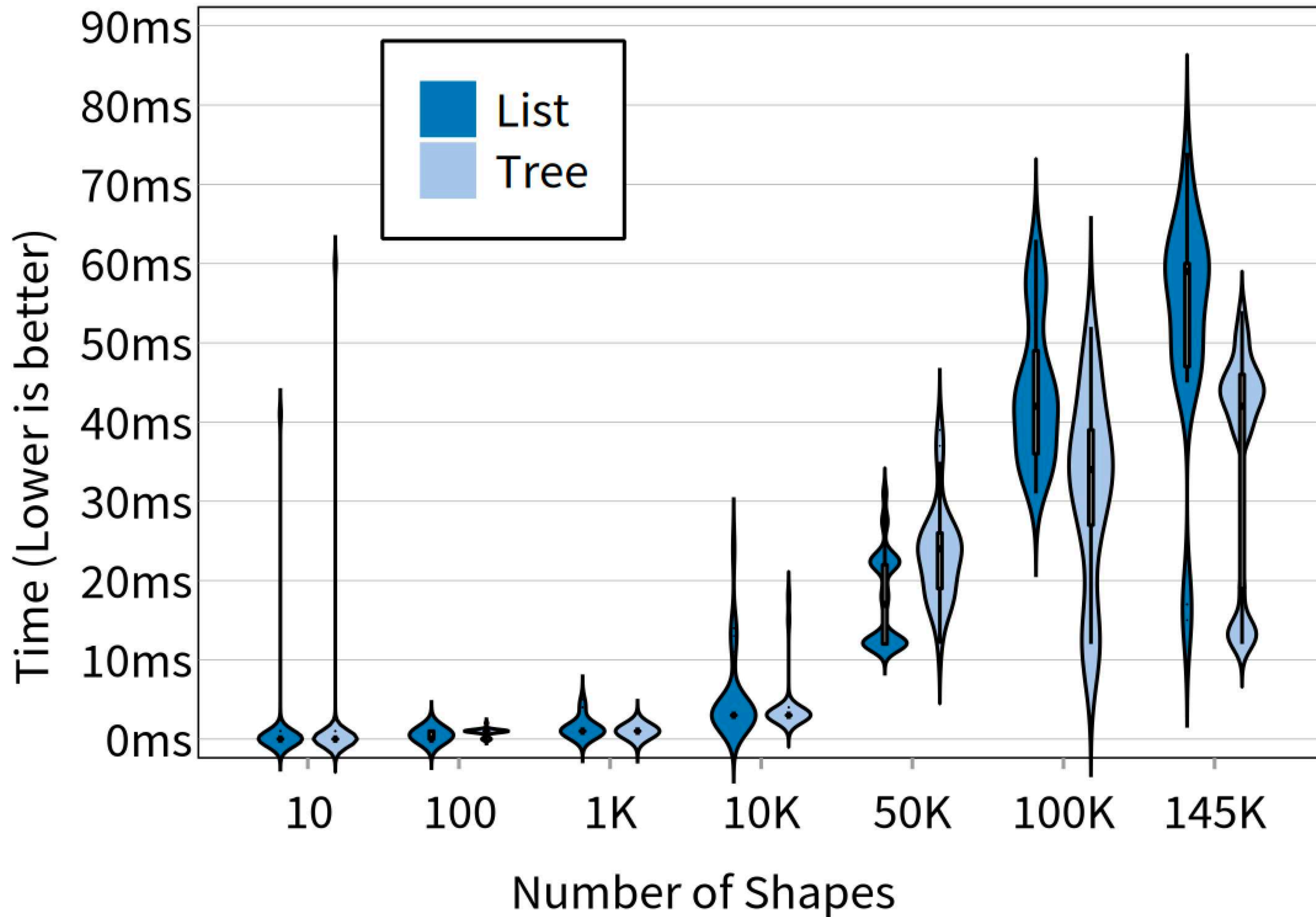
RTree in Roassal



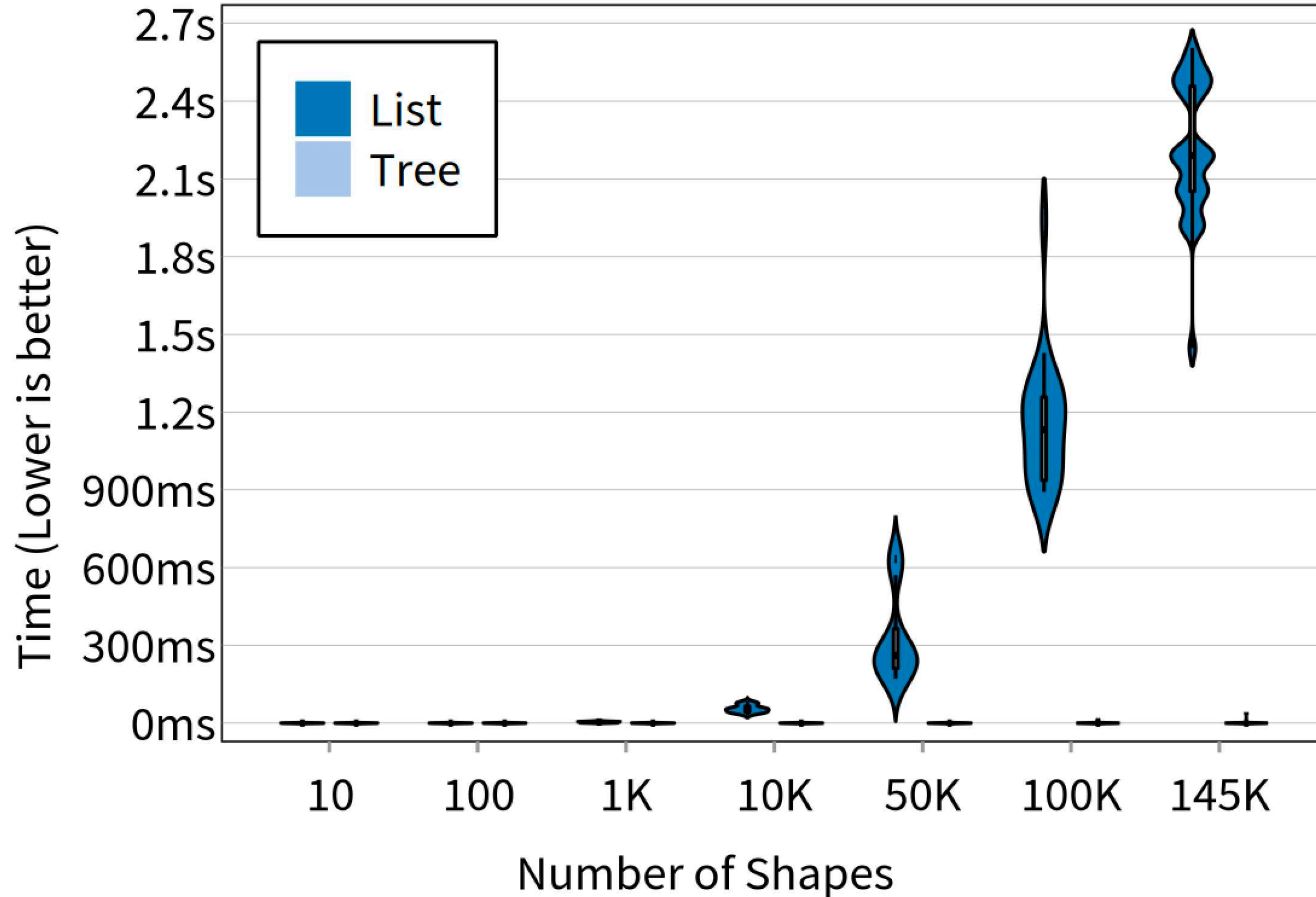
When adding Shapes: Tree vs List



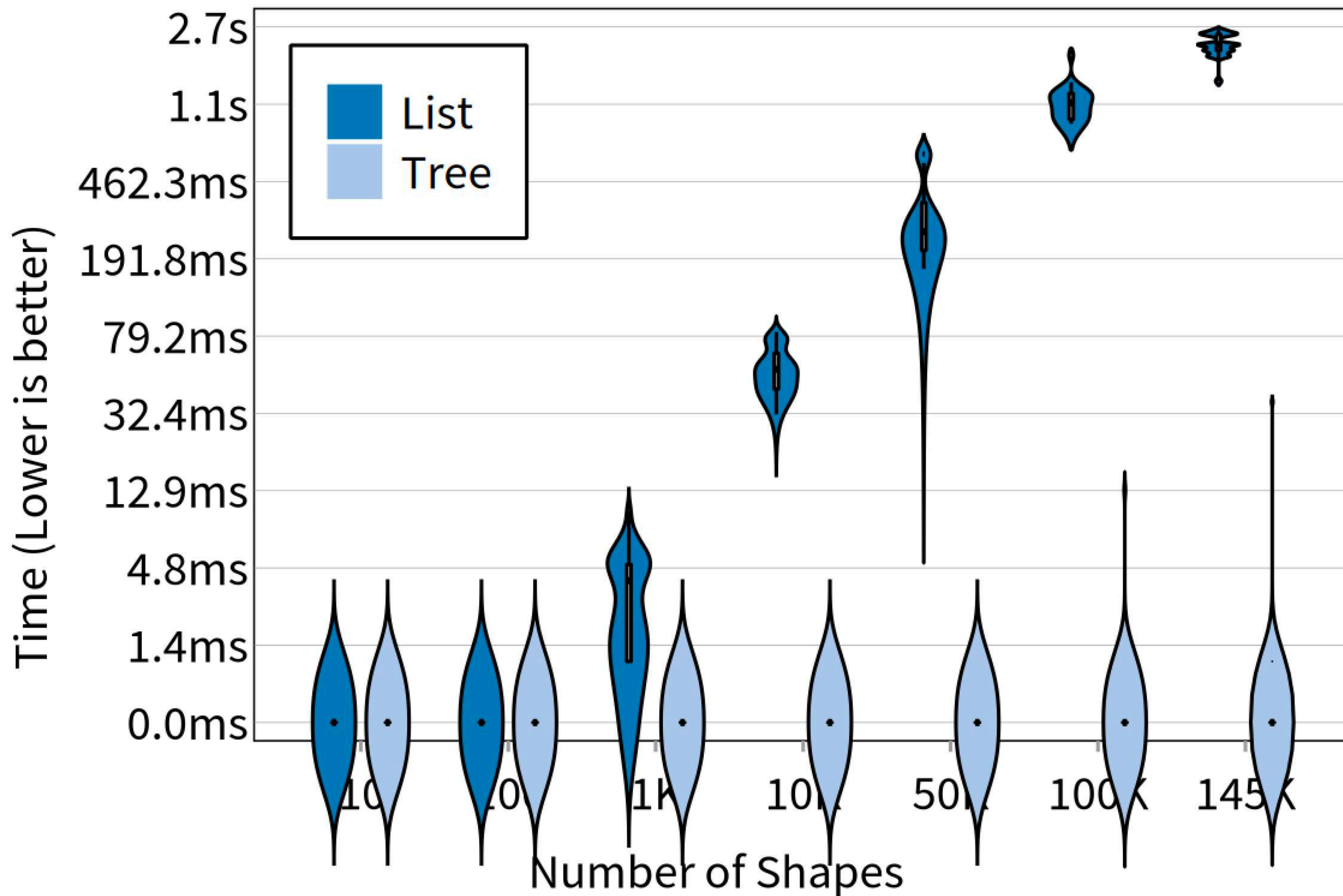
Drawing one Frame: Tree vs List



Mouse move: Tree vs List









Mouse move: Tree vs List



Final result

TODO

-  Charts.
-  Dirty areas.
-  More FPS (GPU, Cores, Caches)
-  Roassal + Bloc
-  Close roassal issues
-  Prepare Roassal for next engineer

Name: Milton Mamani Torres

Country: Bolivia

Occupation: Software Engineer in
Rmod team, Inria

for 2 years, so contact(contract) me.

Do it now!

Github: [https://github.com/akevalion/](https://github.com/akevalion/MyAnimations)

[MyAnimations](#)

Email: akevalion@gmail.com

