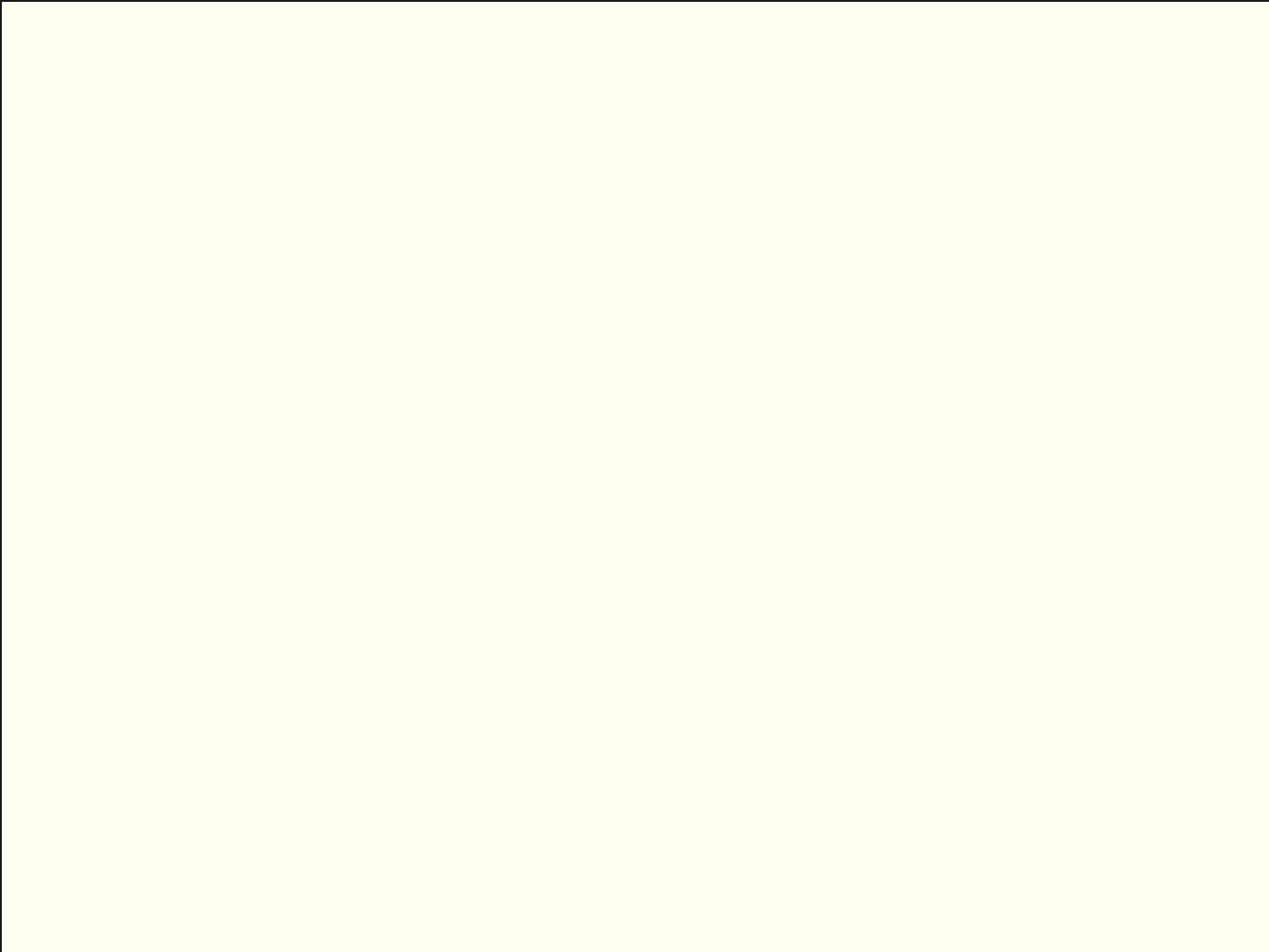


# Makie

## The layout approach

```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
```



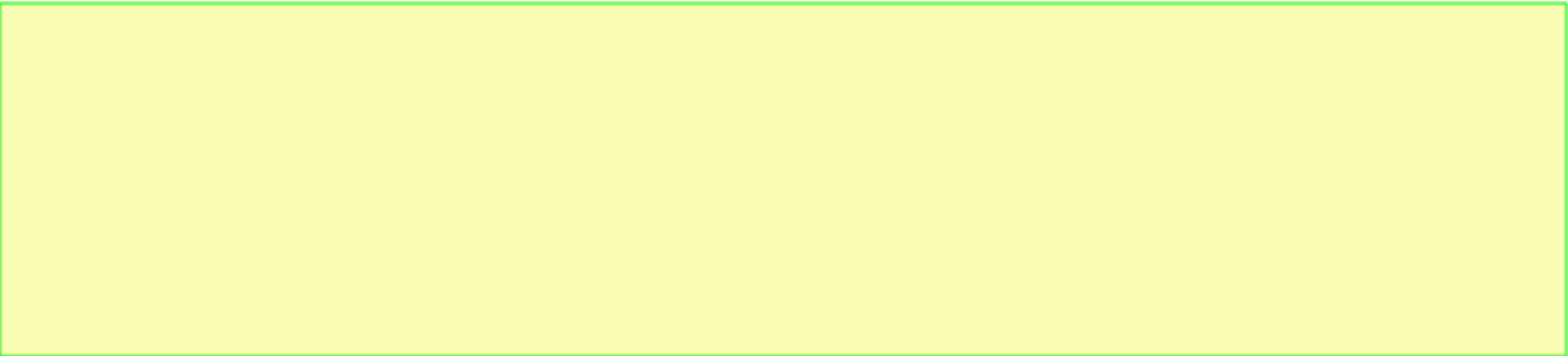
```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
```



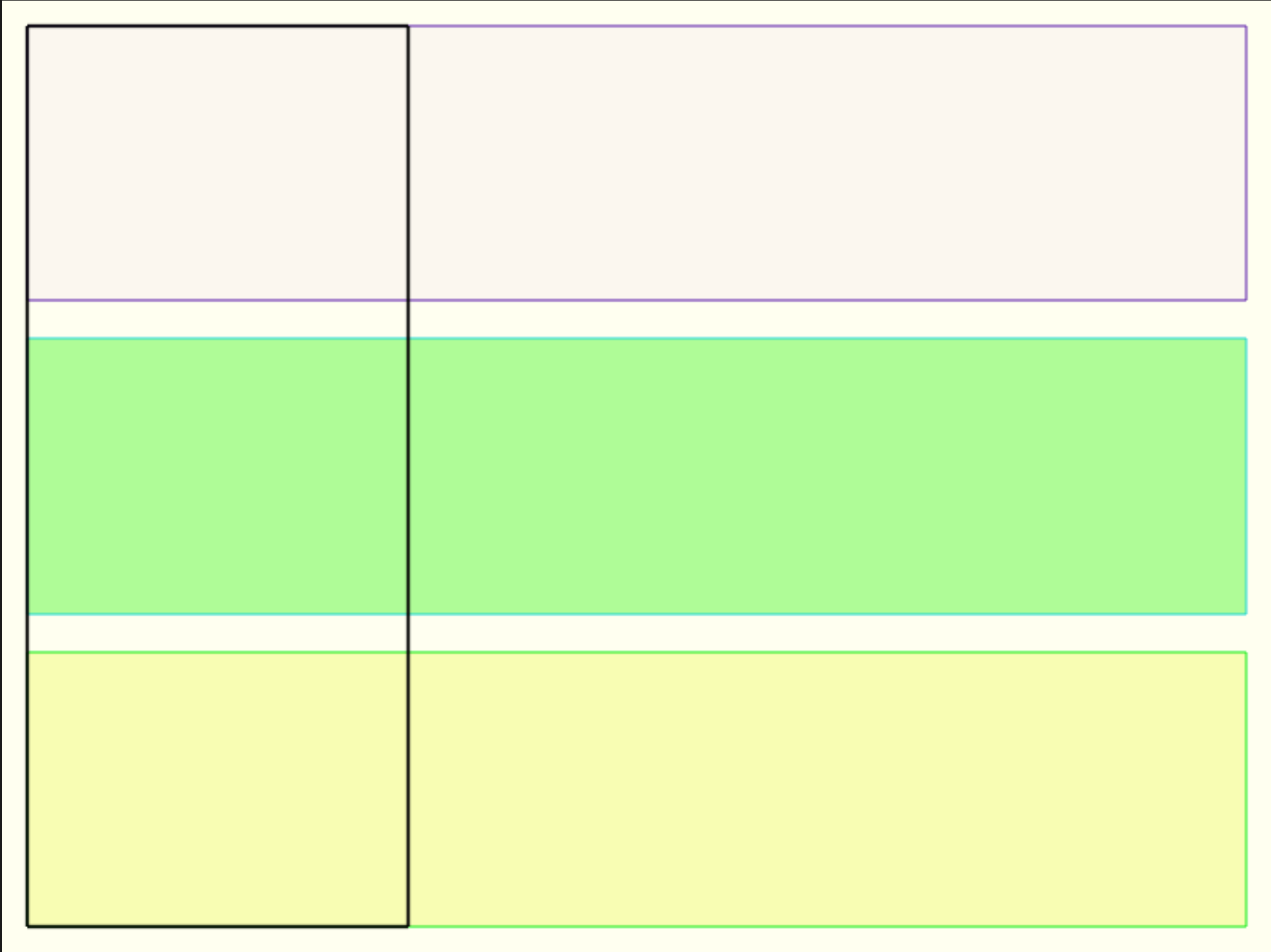
```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
```



```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
```



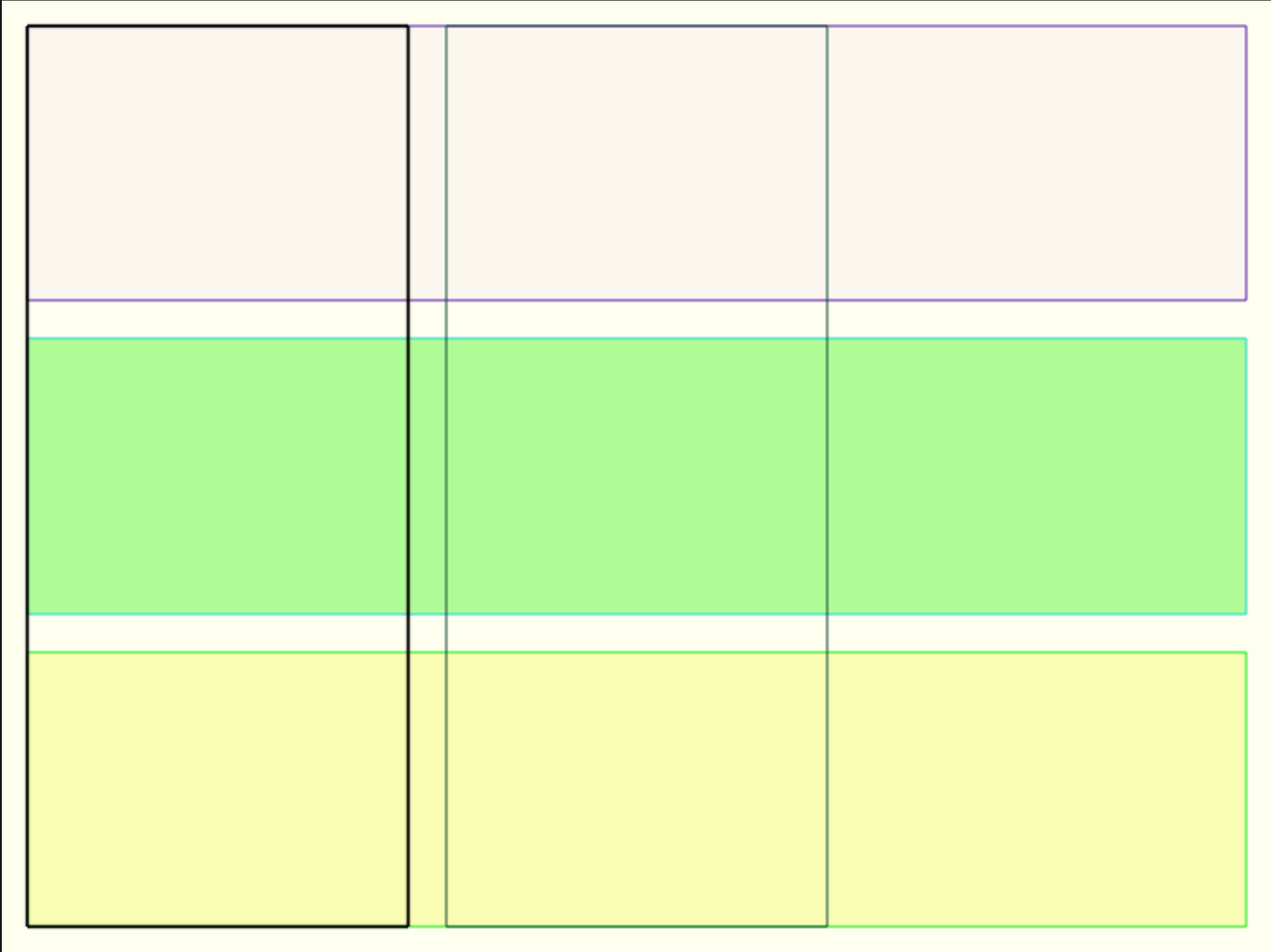
```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
```



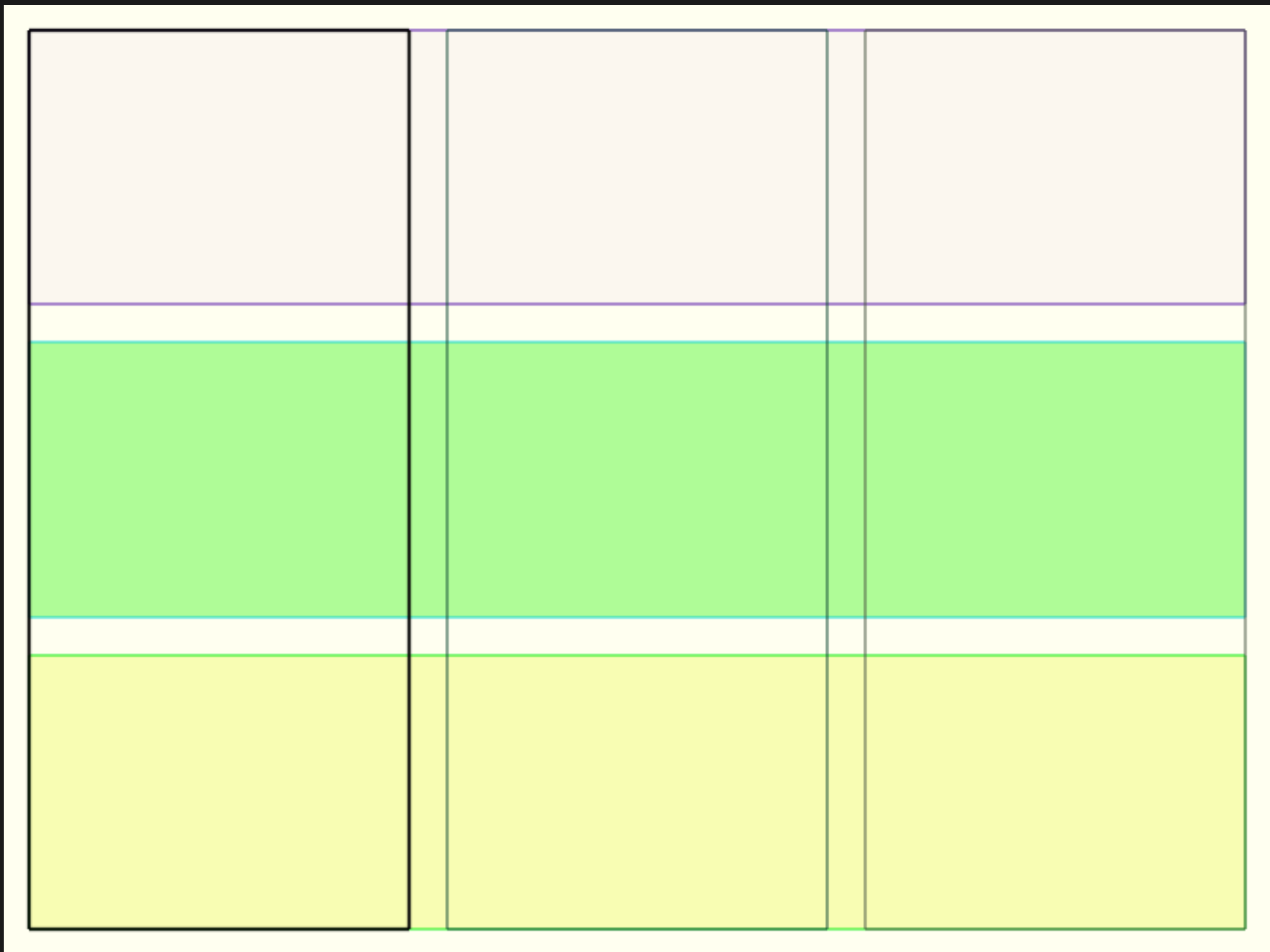
```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))

```



```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
```

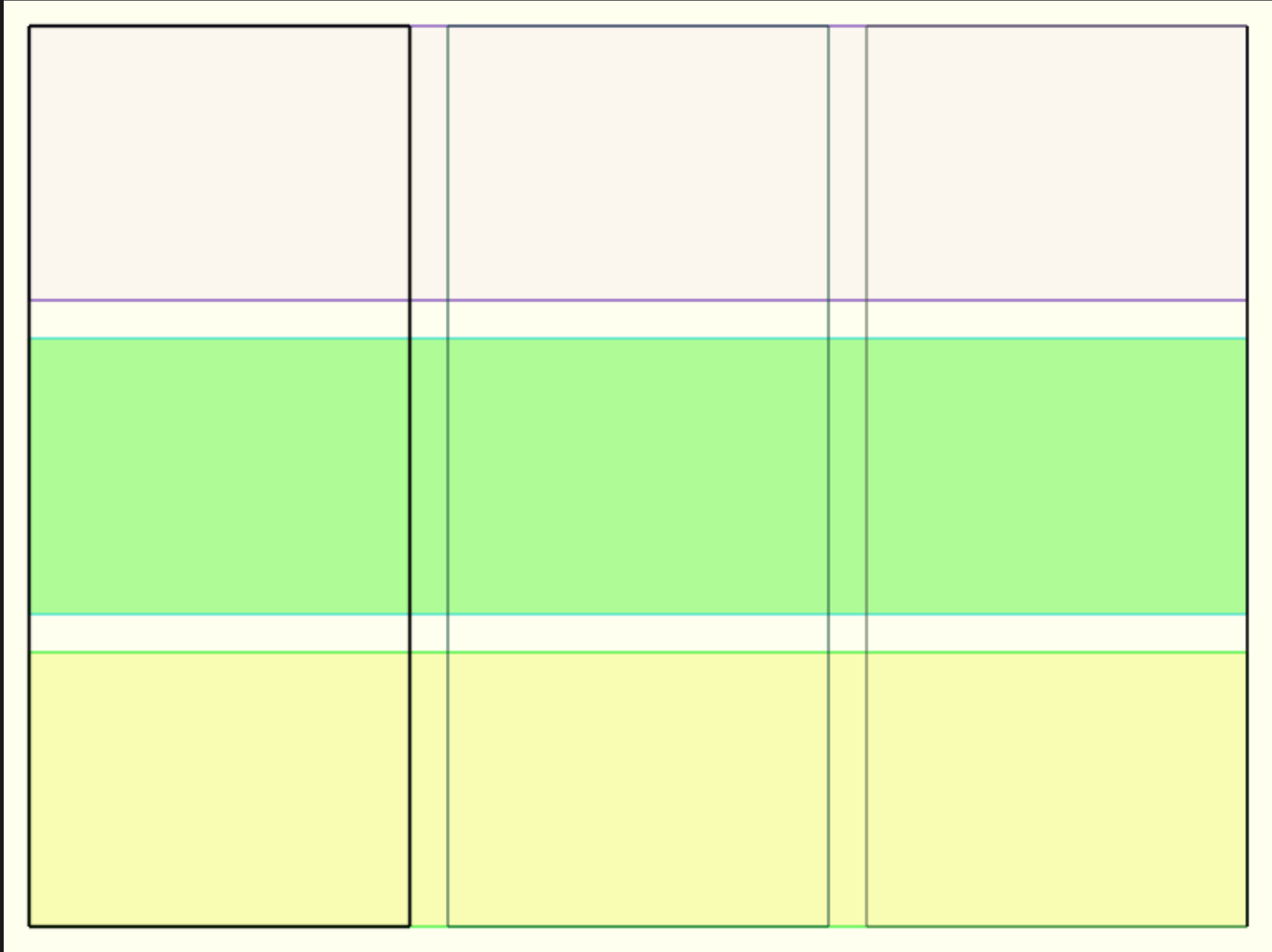




```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(RGBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(RGBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))

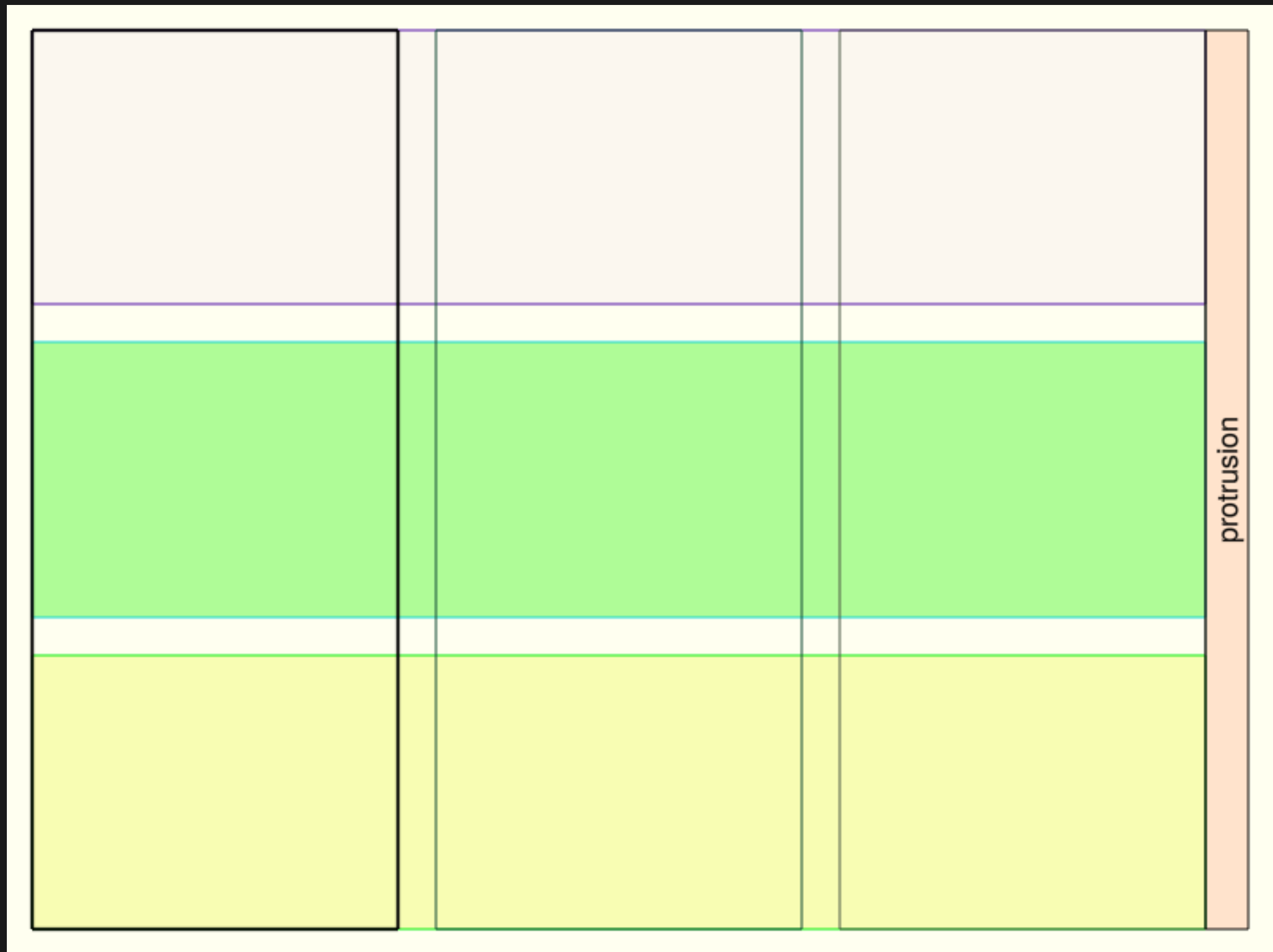
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))

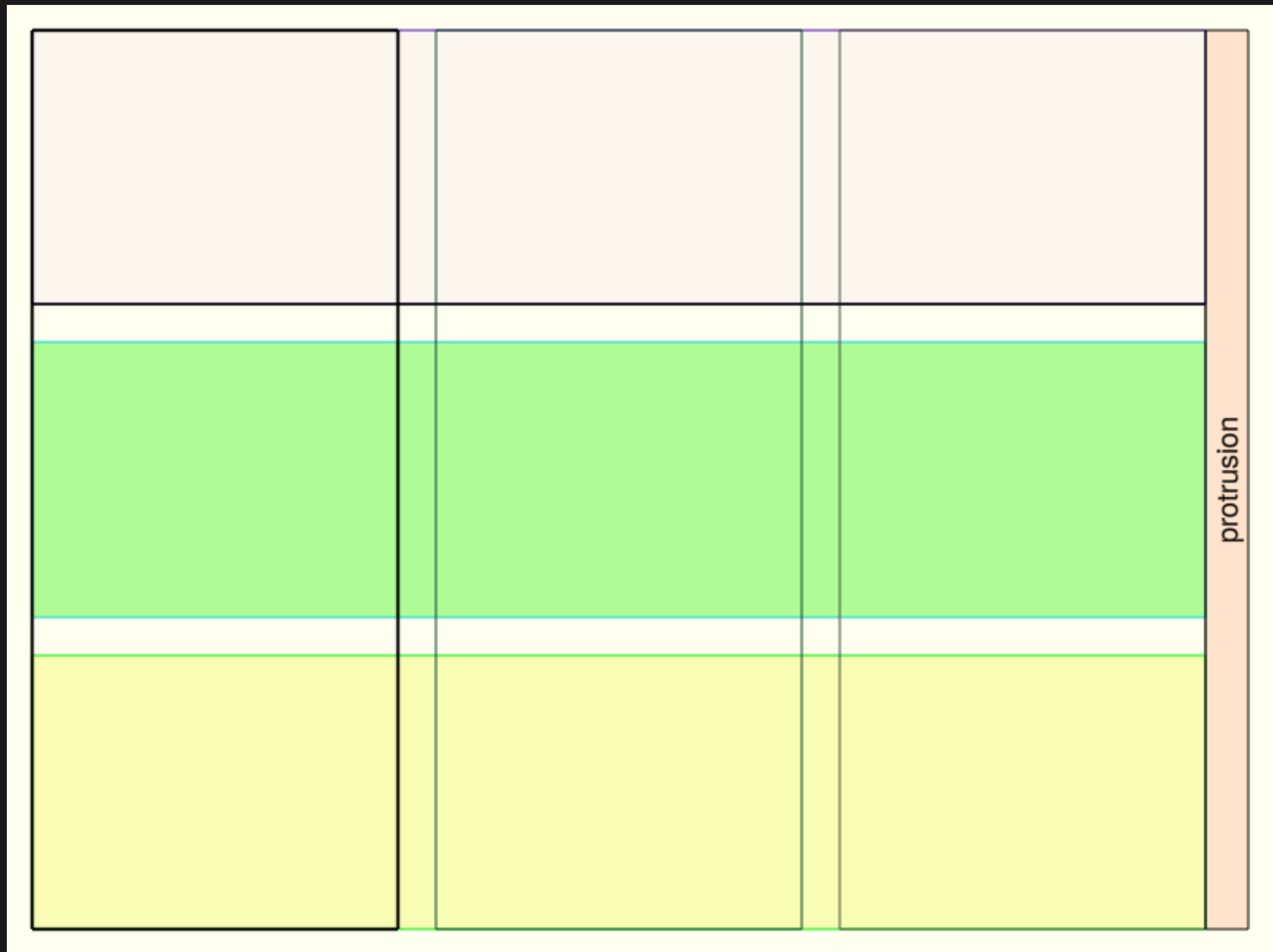
```



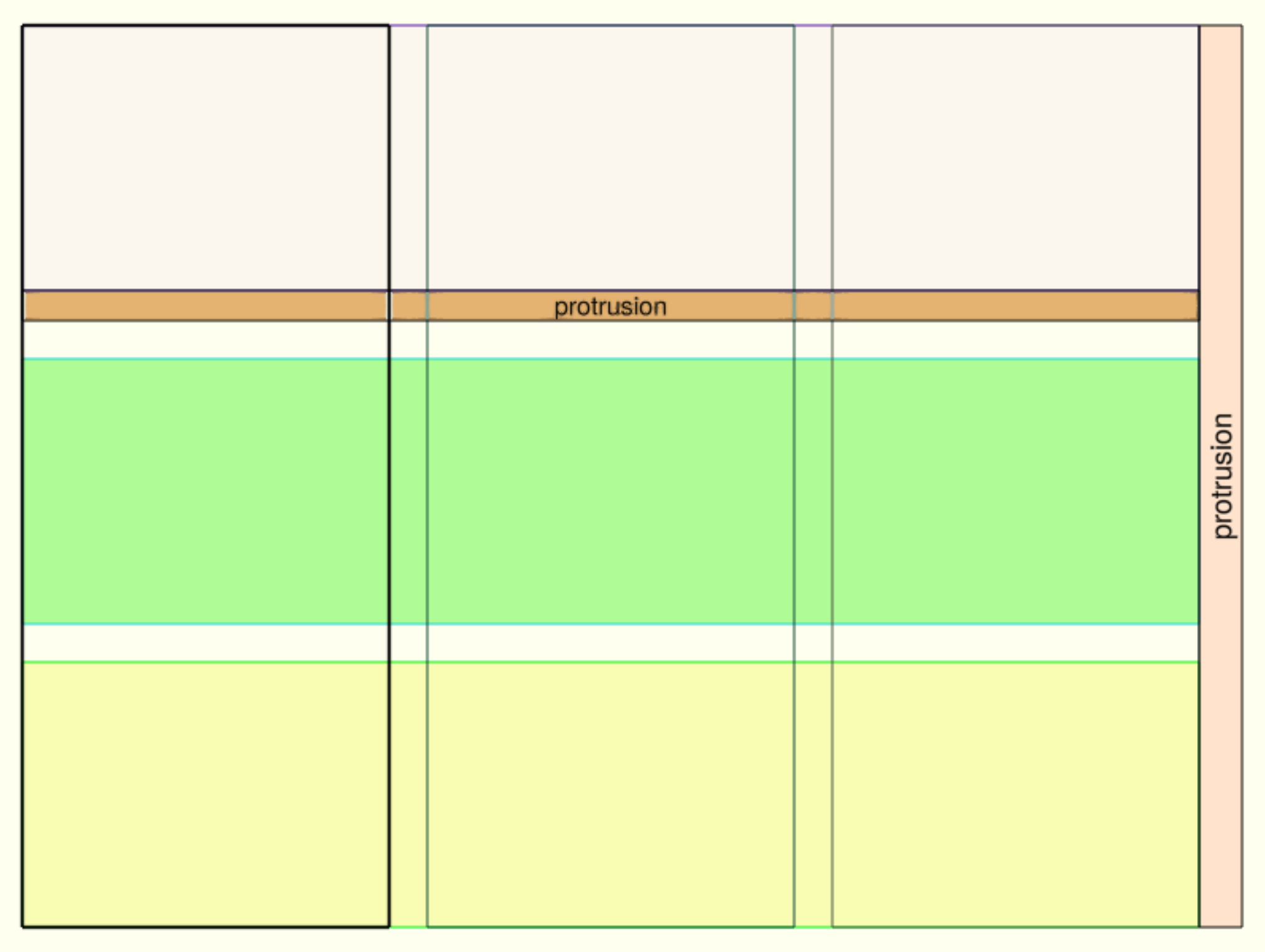
```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))

```



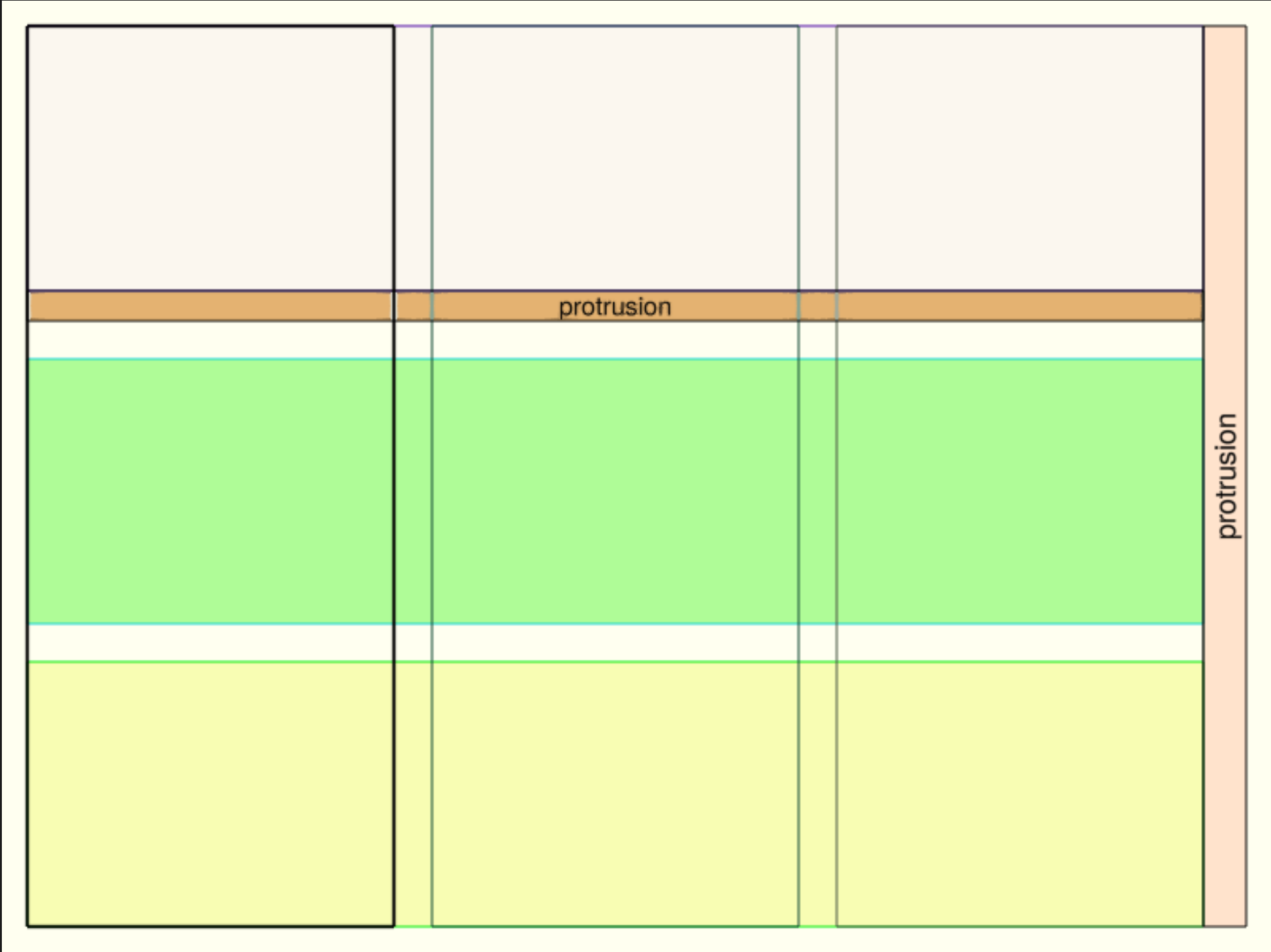
```
using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation = π/ 2, padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))

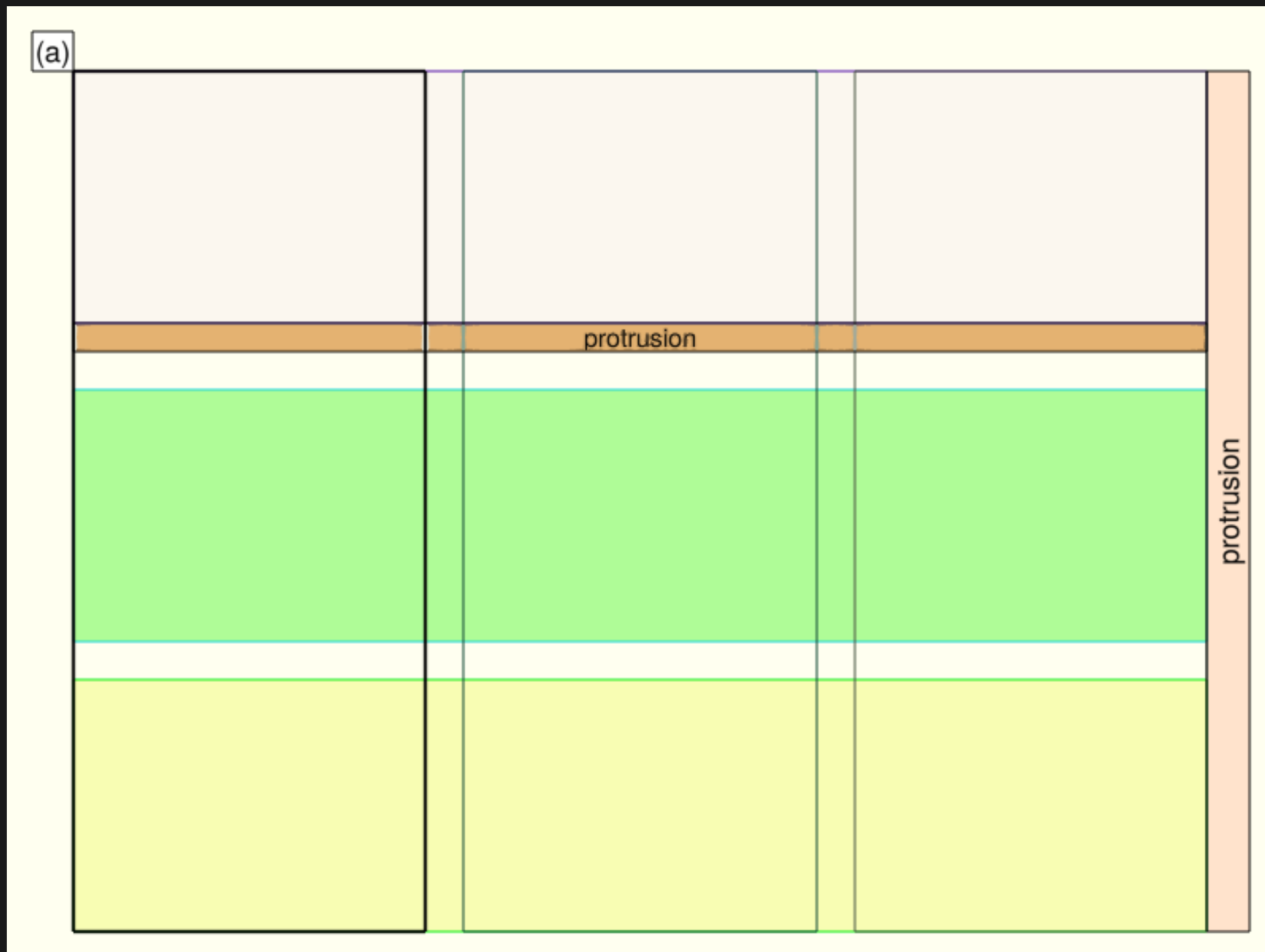
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))

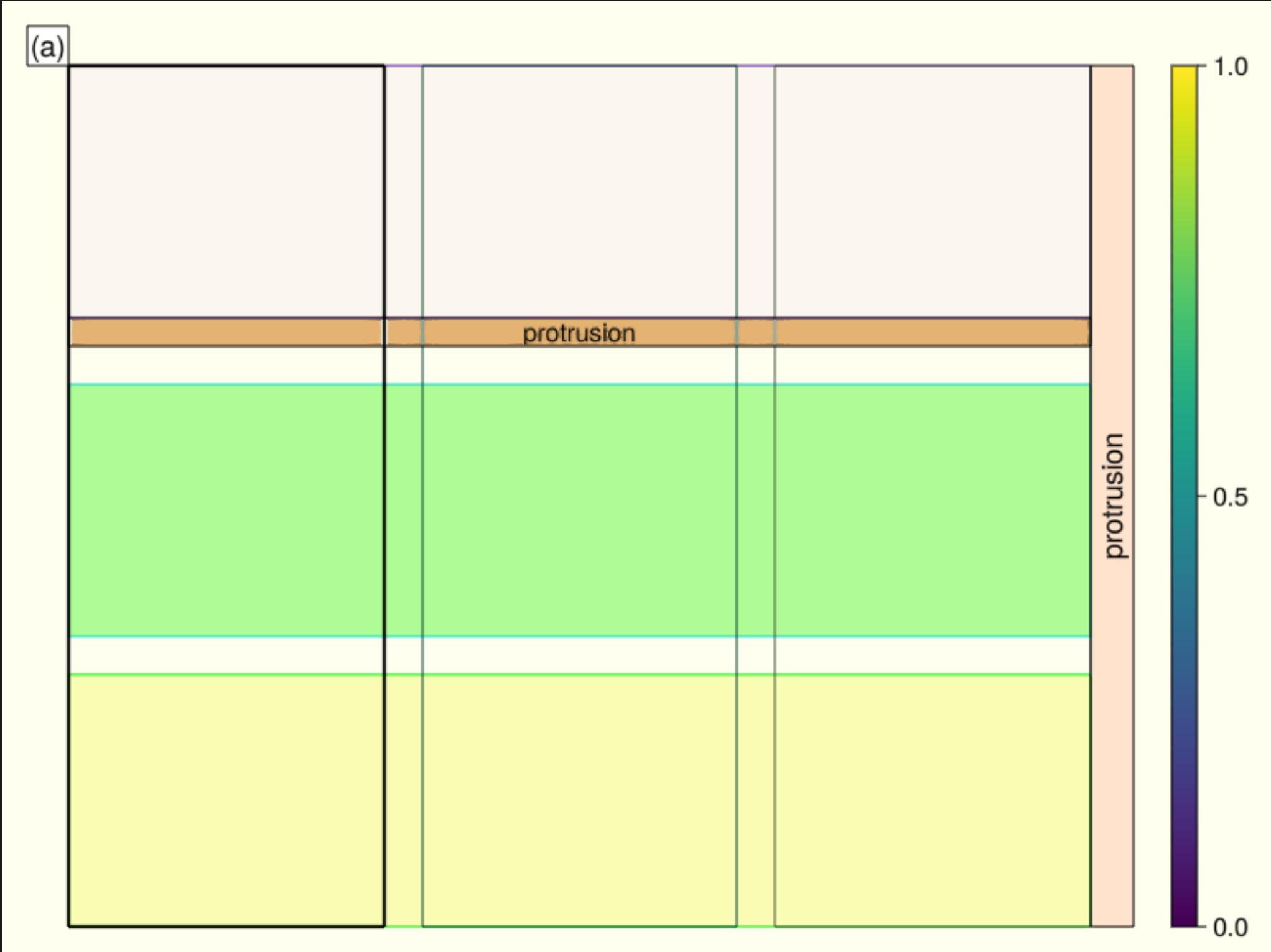
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(RGBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(RGBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(RGBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))
Colorbar(fig[:, end+1])

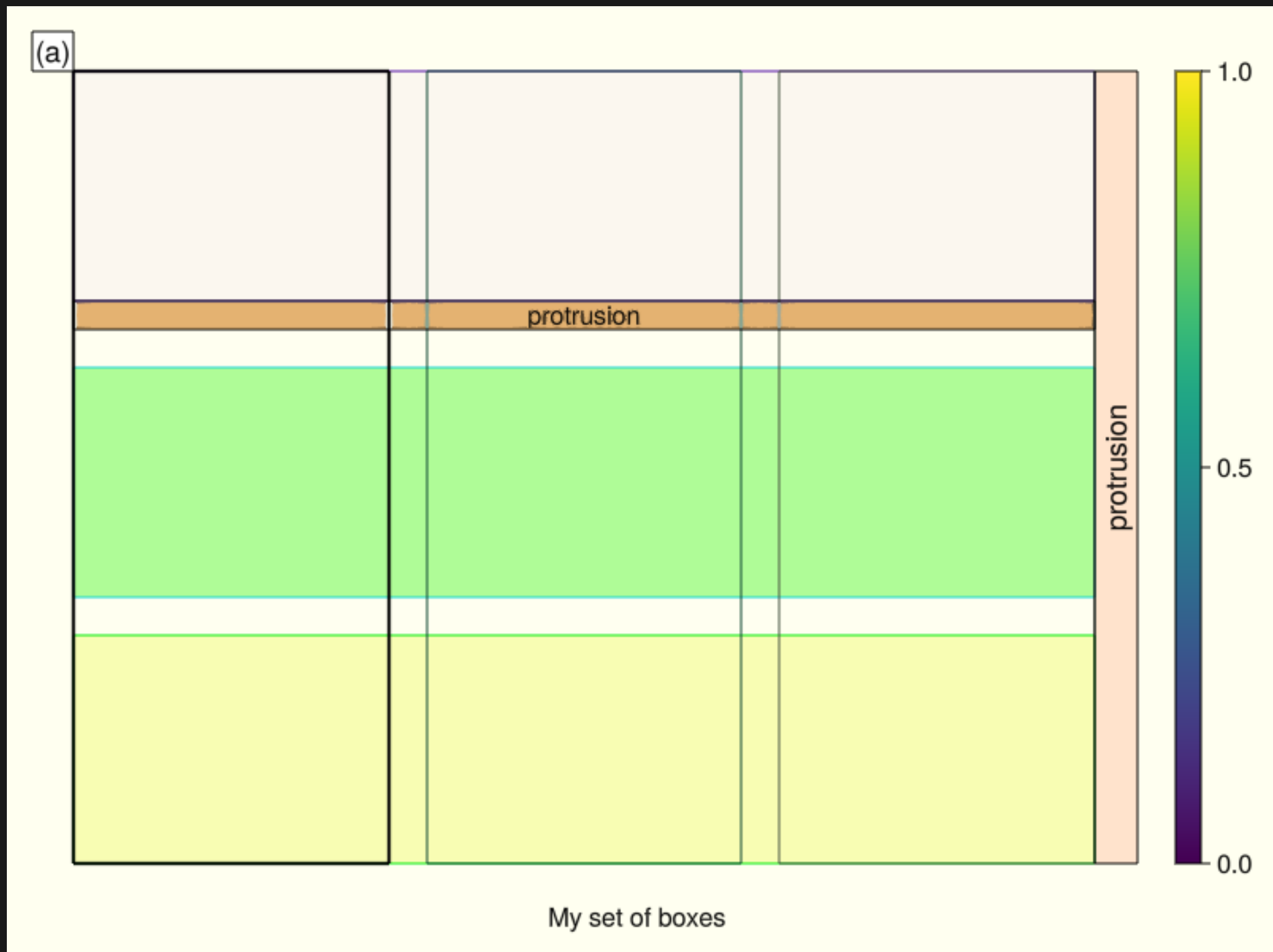
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion", textsize=18, rotation =  $\pi/2$ , padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))
Colorbar(fig[:, end+1])
Label(fig[4, :], "My set of boxes")

```

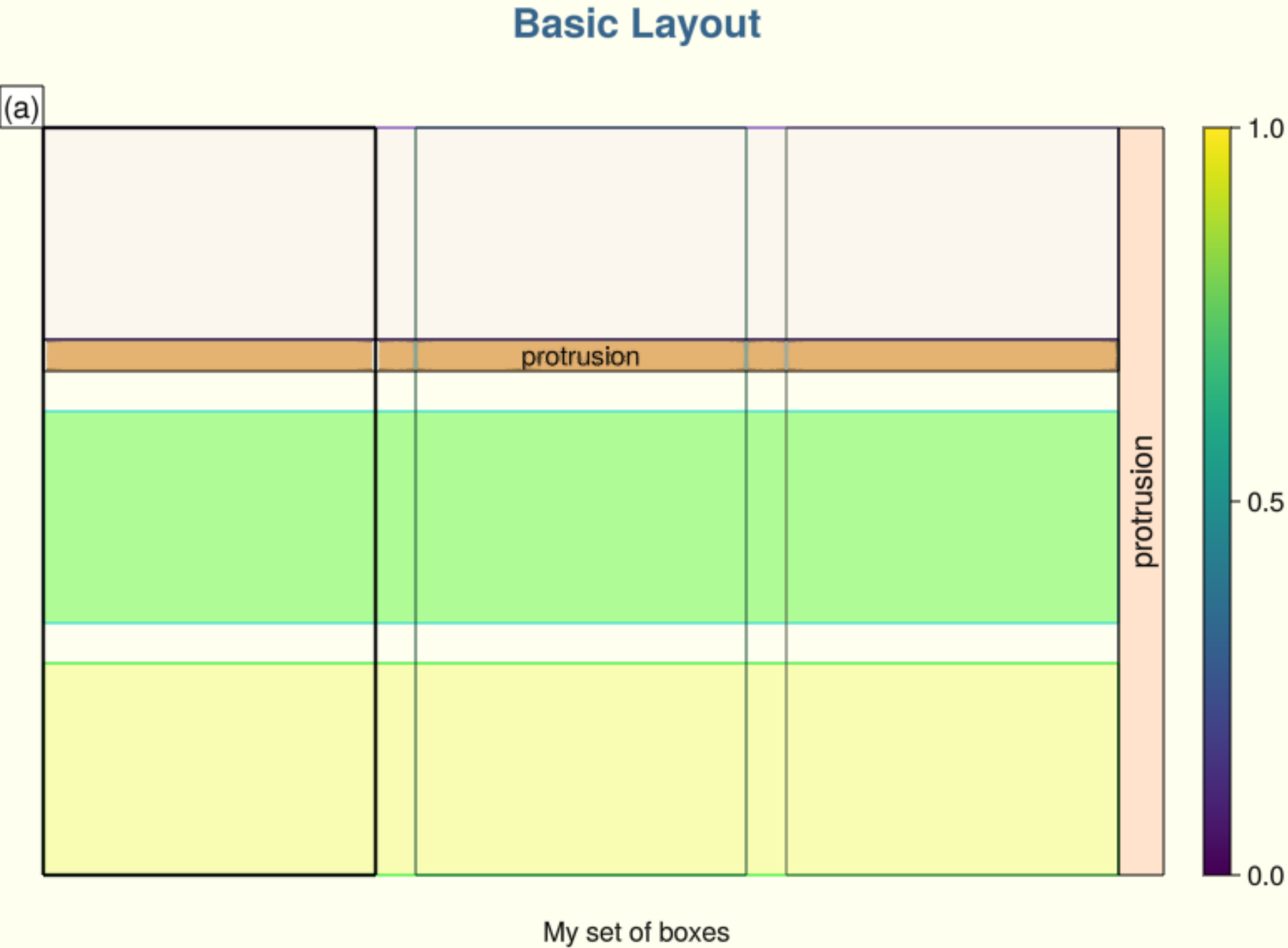




```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion",textsize=18,rotation =  $\pi/2$ ,padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))
Colorbar(fig[:,end+1])
Label(fig[4,:], "My set of boxes")
Label(fig[0,:], "Basic Layout",textsize=24,color=:steelblue4,font="TeX Gyre Heros Bold")

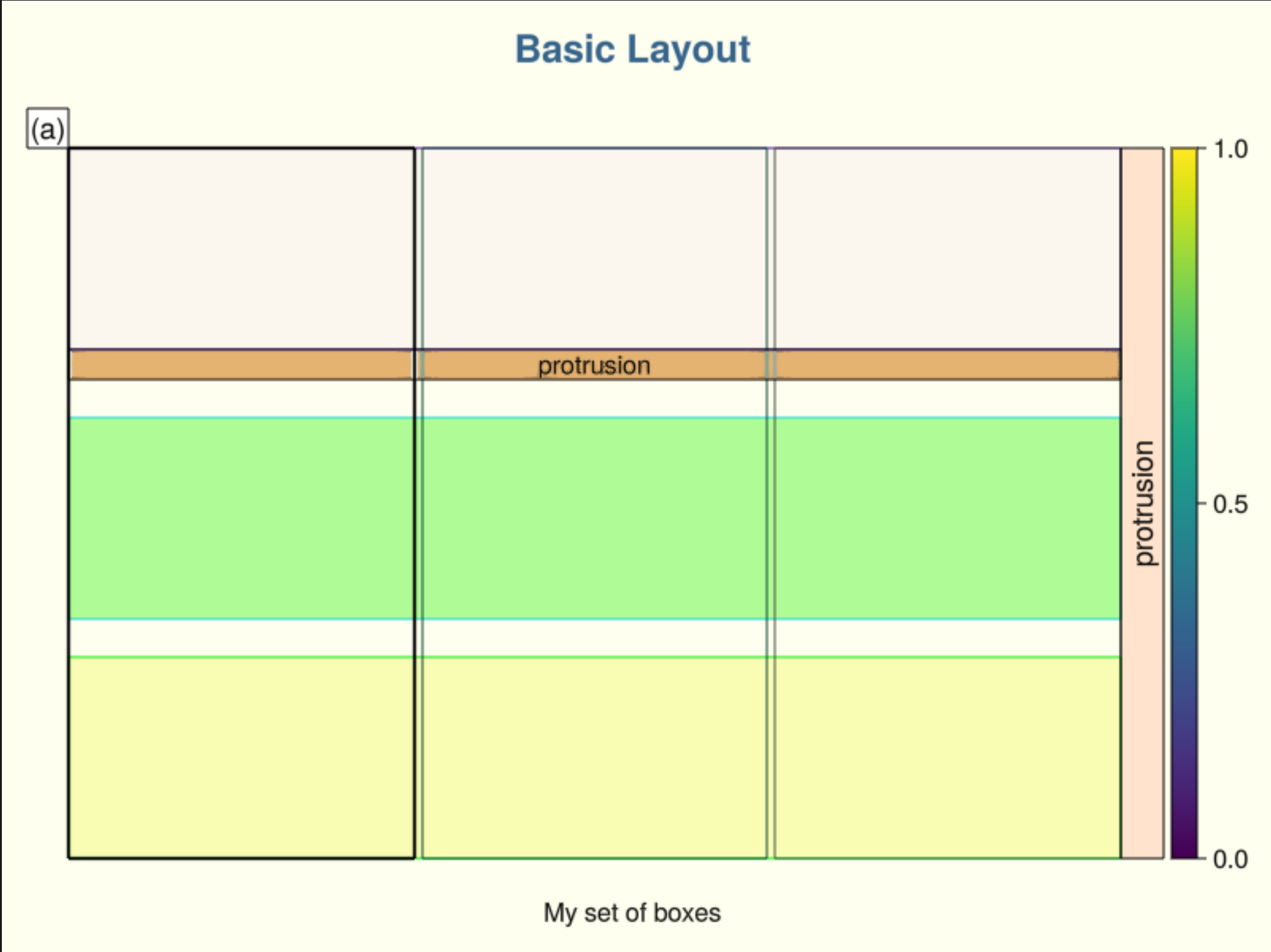
```



```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion",textsize=18,rotation = π/ 2,padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))
Colorbar(fig[:,end+1])
Label(fig[4,:], "My set of boxes")
Label(fig[0,:], "Basic Layout",textsize=24,color=:steelblue4,font="TeX Gyre Heros Bold")
colgap!(fig.layout, 5)

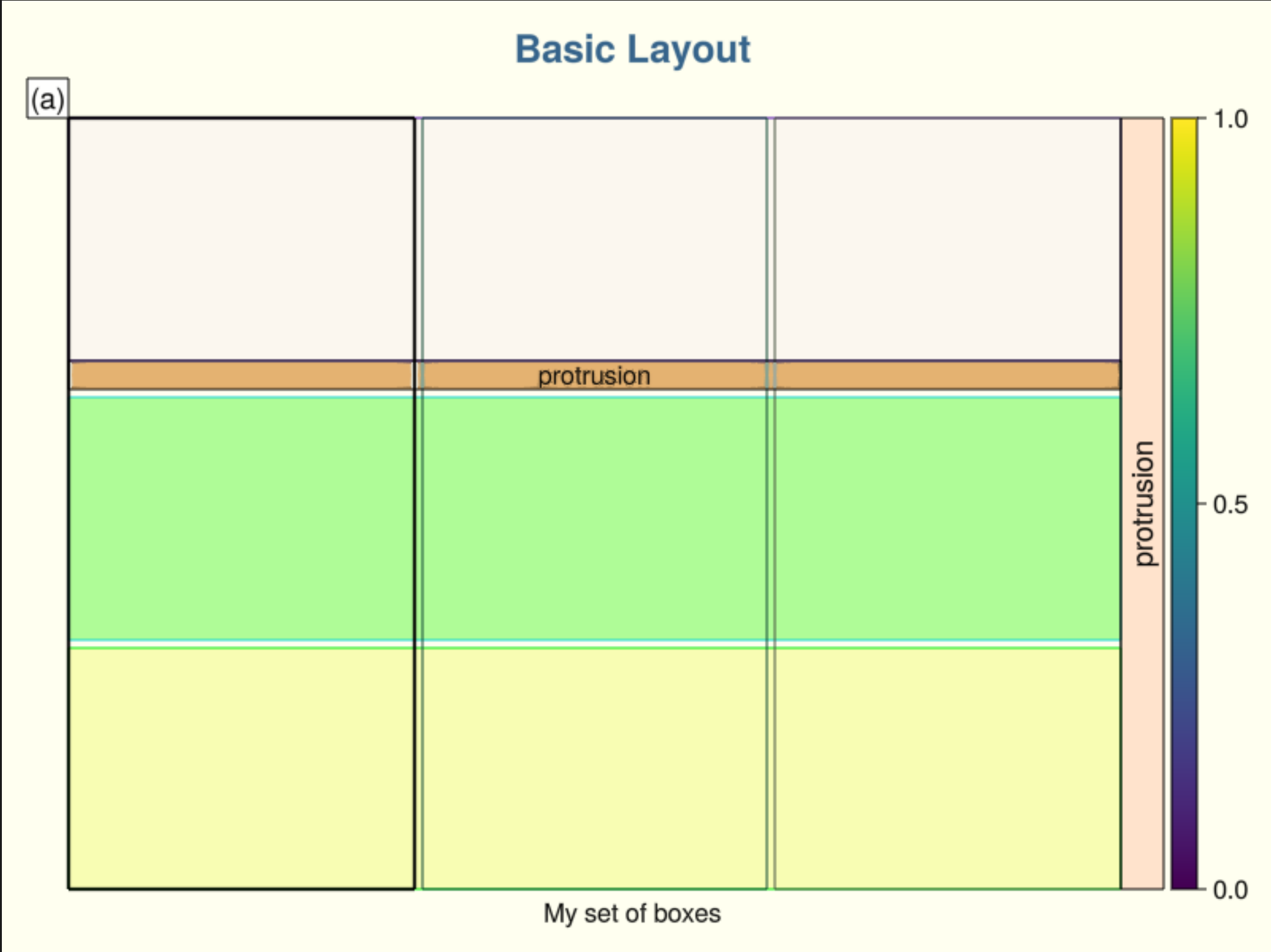
```



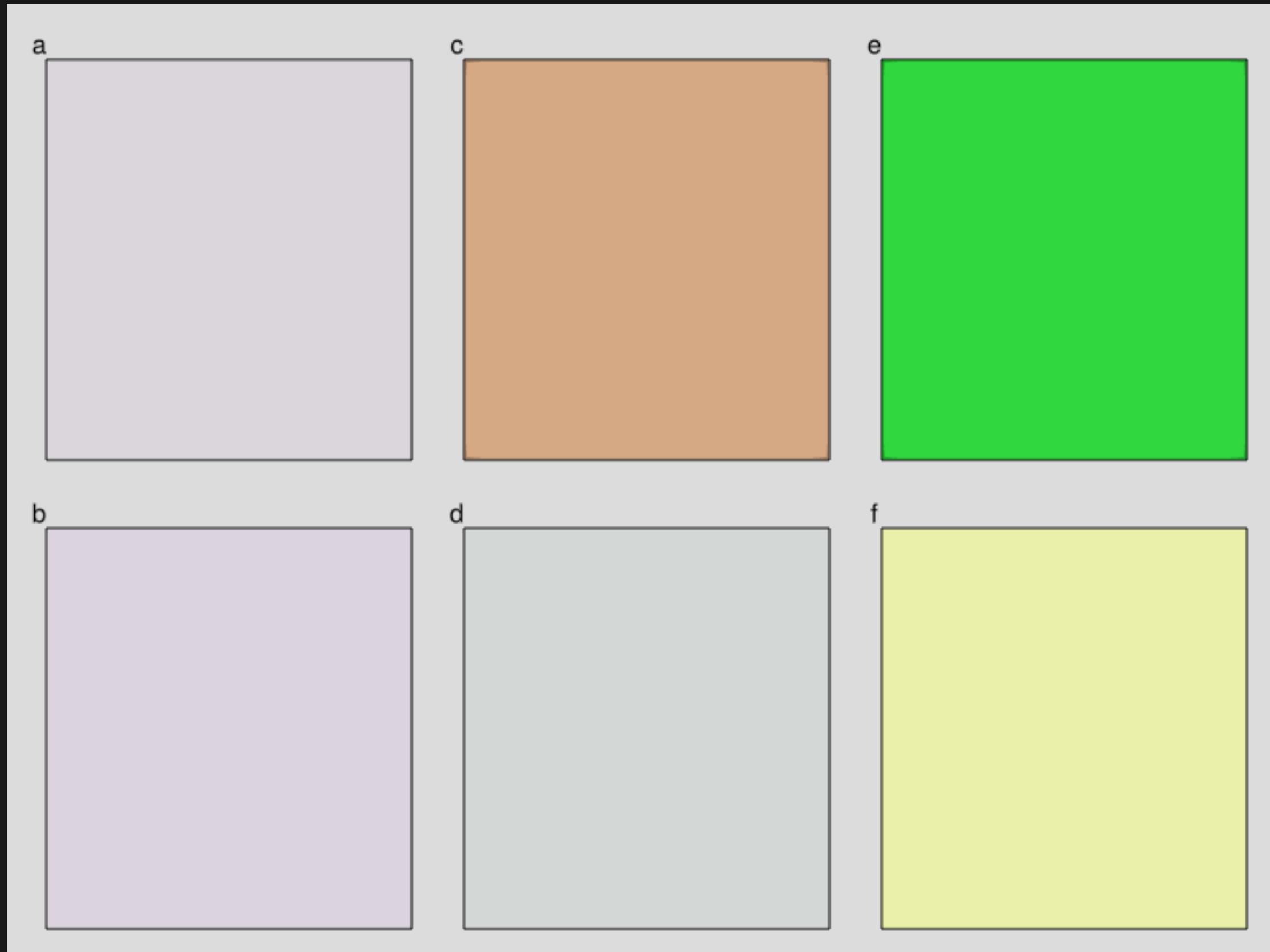
```

using GLMakie, Colors, Random
Random.seed!(435)
fig = Figure(backgroundcolor = :ivory) # named colors
Box(fig[1, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[2, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[3, 1:3]; color=rand(GBAf), strokecolor=rand(GBf))
Box(fig[1:3, 1]; color=:transparent, strokecolor=:black, strokewidth = 2)
Box(fig[1:3, 2]; color=:transparent, strokecolor=rand(GBf))
Box(fig[1:3, 3]; color=:transparent, strokecolor=rand(GBf))
Box(fig[:, 3, Right()]; color=(:orangered, 0.15))
Label(fig[:, 3, Right()], "protrusion",textsize=18,rotation = π/ 2,padding=(3, 3, 3, 3))
Box(fig[1, 1:3, Bottom()]; color=rand(GBAf))
Label(fig[1, 2, Bottom()], "protrusion")
Box(fig[1:3, 1, TopLeft()]; color = (:white, 0.95))
Label(fig[1:3, 1, TopLeft()], "(a)"; textsize=18, padding=(2, 2, 2, 2))
Colorbar(fig[:,end+1])
Label(fig[4,:], "My set of boxes")
Label(fig[0,:], "Basic Layout",textsize=24,color=:steelblue4,font="TeX Gyre Heros Bold")
colgap!(fig.layout, 5)
rowgap!(fig.layout, 5)

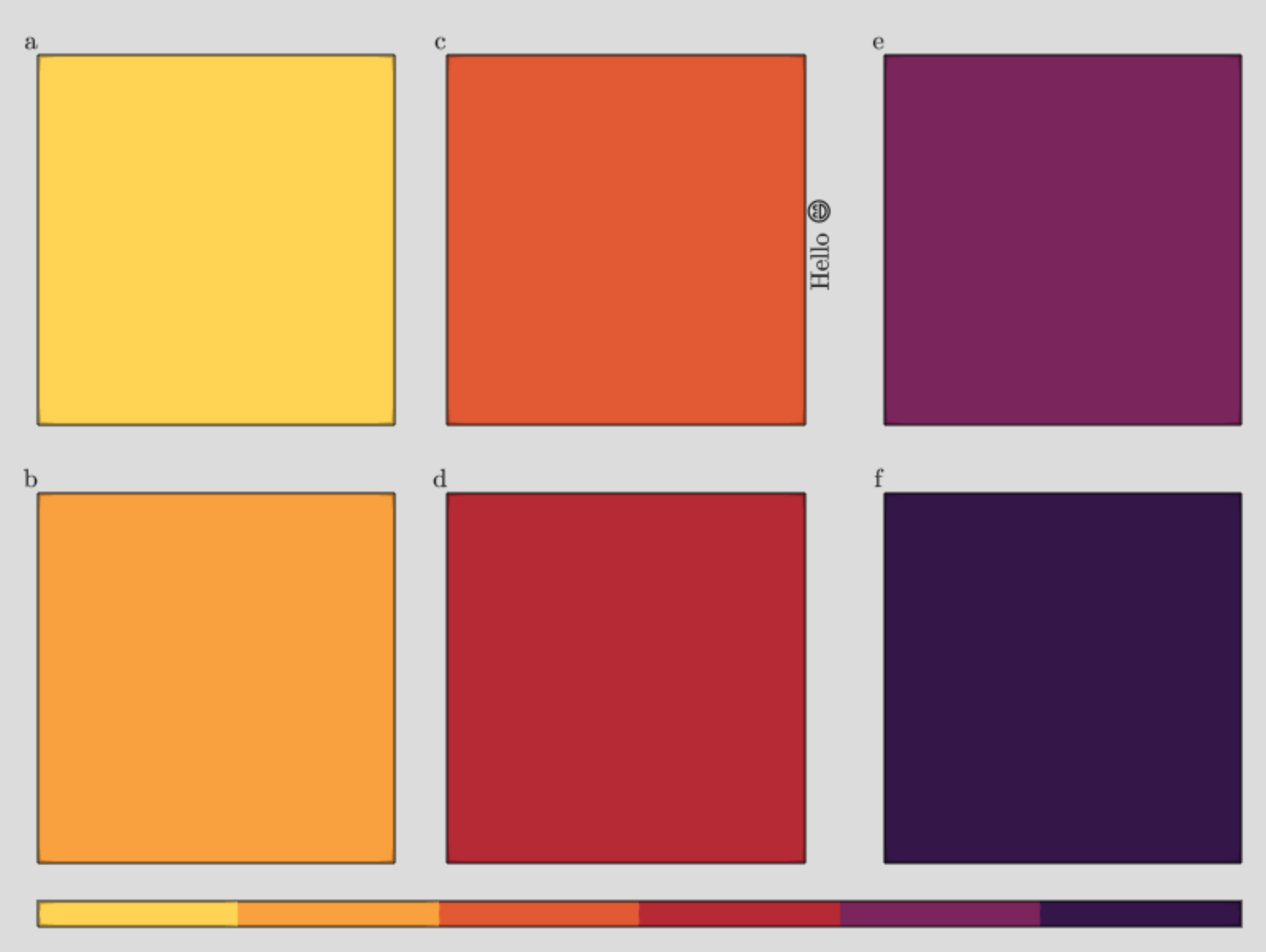
```



Task 1  
Your code goes here!



Task 2  
Your code goes here!



Task 3  
Your code goes here!

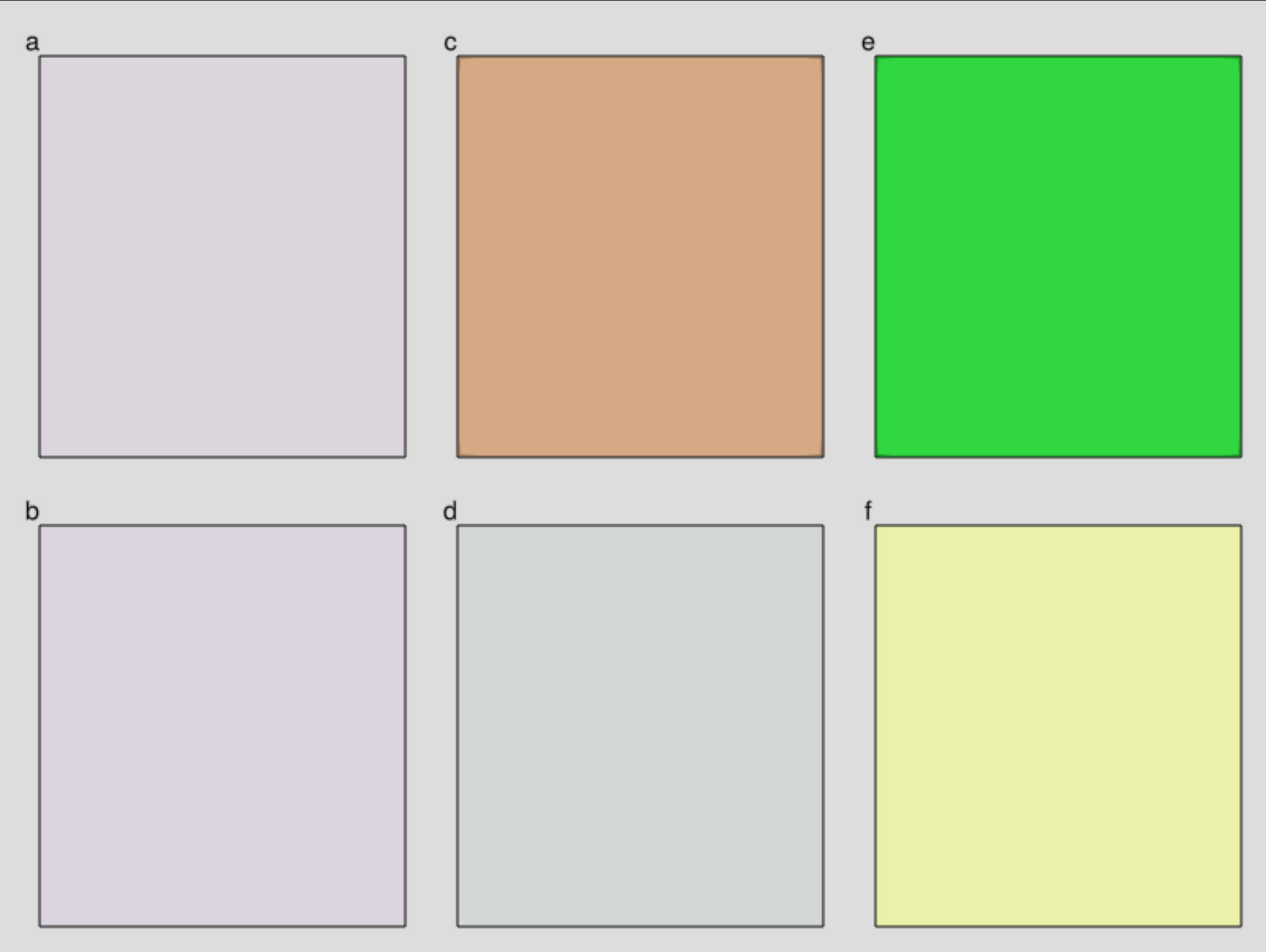


Hey 🗨️

```

using GLMakie, Colors, Random
GLMakie.activate!()
GLMakie.set_window_config!(float=true)
Random.seed!(435)
αbto = reshape(string('a':'f'), (2,3))
fig = Figure(backgroundcolor = :gainsboro)
[Box(fig[i, j], color = rand(GBAf)) for i in 1:2, j in 1:3]
[Label(fig[i, j, TopLeft()], αbto[i,j]) for i in 1:2, j in 1:3]
fig

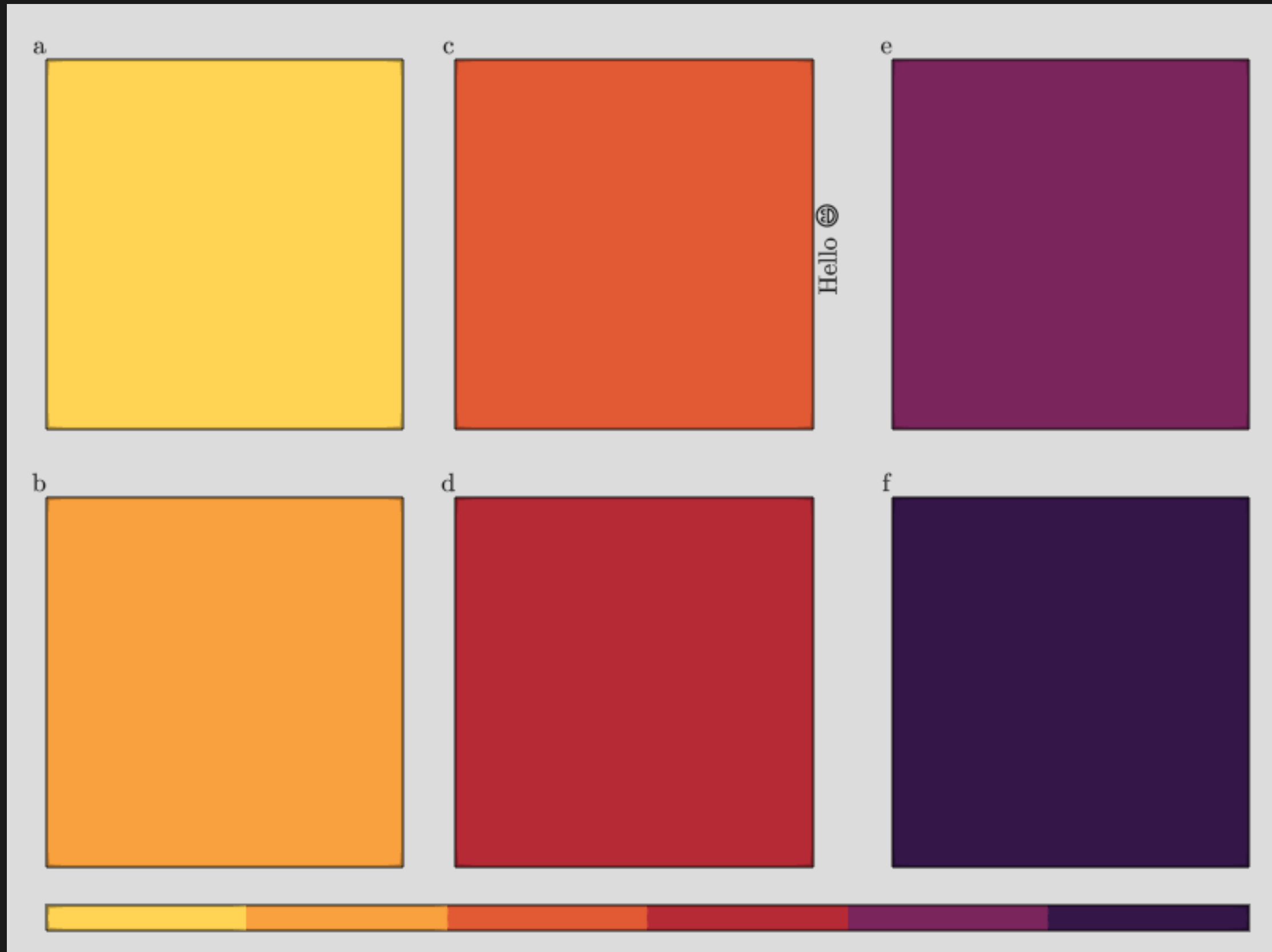
```



```

using GLMakie, Colors, Random
GLMakie.activate!()
GLMakie.set_window_config!(float=true)
Random.seed!(435)
colors = resample_cmap(:Tam, 6)
c = reshape(colors, (2,3))
αbto = reshape(string('a':'f'), (2,3))
fig = Figure(backgroundcolor = :gainsboro, font="CMU Serif")
[Box(fig[i, j], color = c[i,j]) for i in 1:2, j in 1:3]
[Label(fig[i, j, TopLeft()], αbto[i,j]) for i in 1:2, j in 1:3]
Label(fig[1,2, Right()], "Hello 😊 ", rotation = π/ 2)
Colorbar(fig[3, 1:3], colormap=cgrad(colors, categorical=true),
    vertical = false,
    flipaxis=false,
    ticksvisible=false,
    ticklabelsvisible=false)
fig

```





```

using GLMakie, Colors, Random
GLMakie.activate!()
GLMakie.set_window_config!(float=true)
Random.seed!(435)
pastel = resample_cmap(:Pastel2_4, 4)
fig = Figure()
Box(fig[1, 1:2], color = pastel[1])
Box(fig[1, 3], color = pastel[2])
Box(fig[2, 1:3], color = pastel[3])
Box(fig[3, 1:3], color = pastel[4])
Box(fig[2:3, 3, Right()], color = :transparent,
    strokecolor = (:brown, 0.5))
Label(fig[2:3, 3, Right()], "Hey ☕", color = :brown,
    rotation = pi / 2, padding = (3, 3, 3, 3))
colsize!(fig.layout, 1, Auto(2))
rowsize!(fig.layout, 2, Auto(0.5))
rowsize!(fig.layout, 3, Auto(0.5))
rowgap!(fig.layout, 1, 15)
rowgap!(fig.layout, 2, 5)
colgap!(fig.layout, 5)
fig

```

