Introducing

RATATUI

A Rust library for cooking up delicious

Terminal User Interfaces

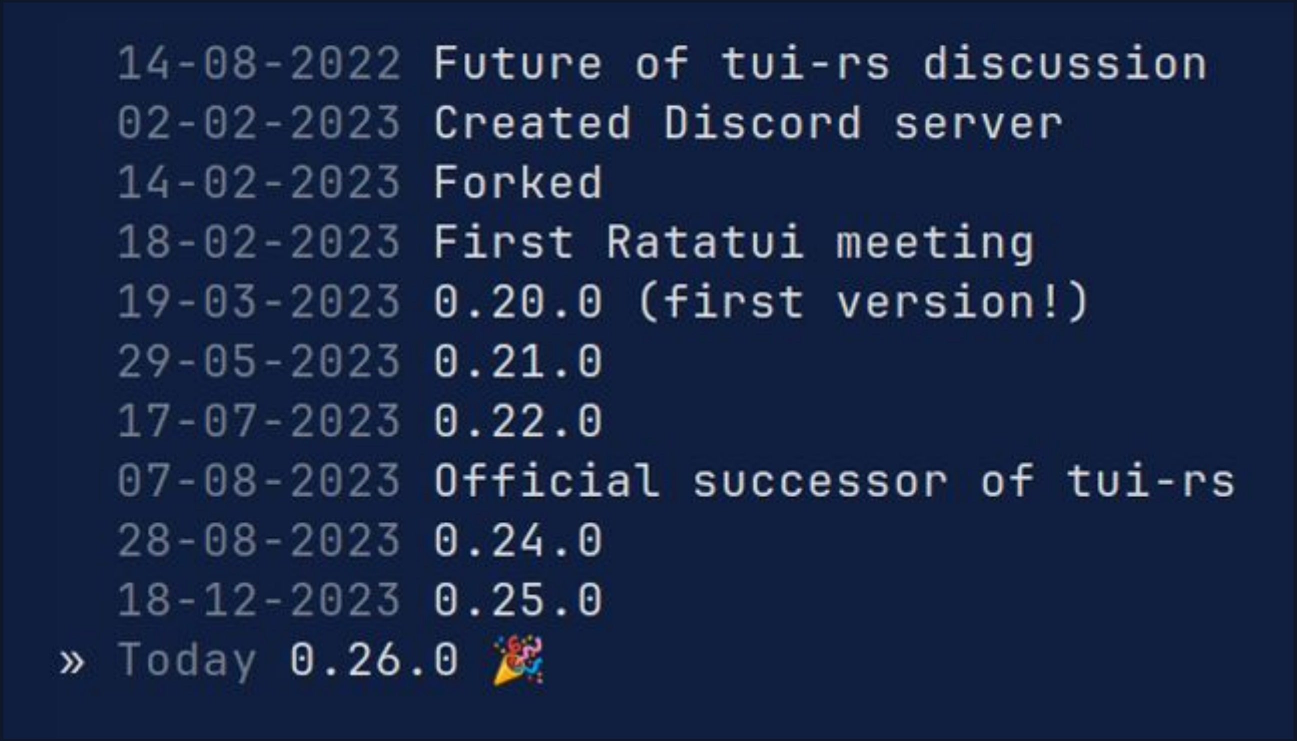
ratatui.rs

Orhun Parmaksız

Who am I?

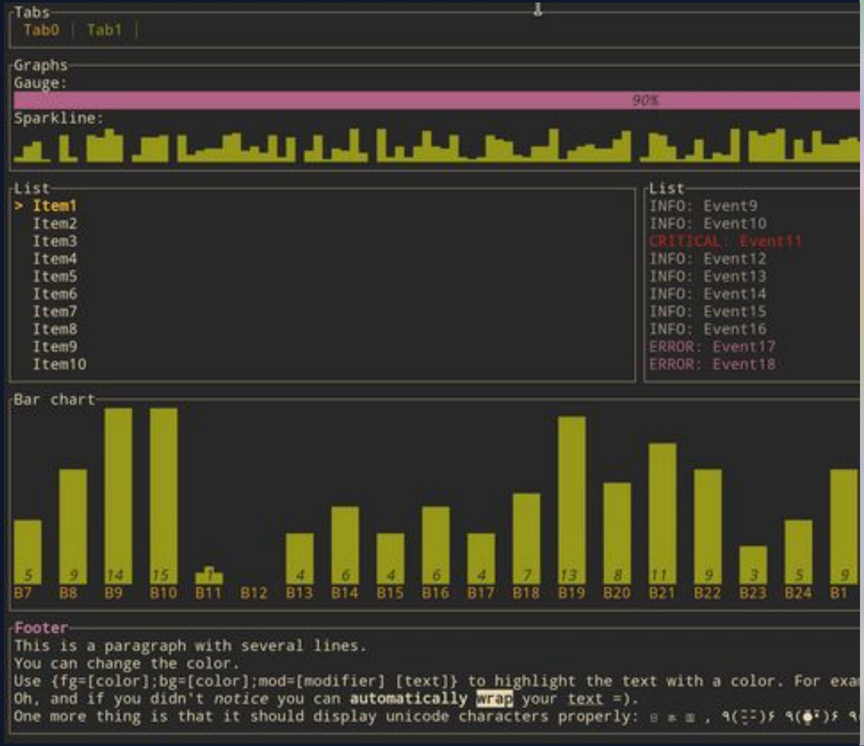
- ✨ Open Source Developer
  - @orhun on GitHub
  - Creator of git-cliff.org, kmon, gpg-tui, systeroid…
- 🦀 Project Leader @ ratatui.rs
- 📦 Package Maintainer @ Arch Linux & Alpine Linux

Ratatui



```
   14-08-2022 Future of tui-rs discussion
   02-02-2023 Created Discord server
   14-02-2023 Forked
   18-02-2023 First Ratatui meeting
   19-03-2023 0.20.0 (first version!)
   29-05-2023 0.21.0
   17-07-2023 0.22.0
   07-08-2023 Official successor of tui-rs
   28-08-2023 0.24.0
   18-12-2023 0.25.0
 » Today 0.26.0 🎉
```

tui-rs (Florian Dehau)

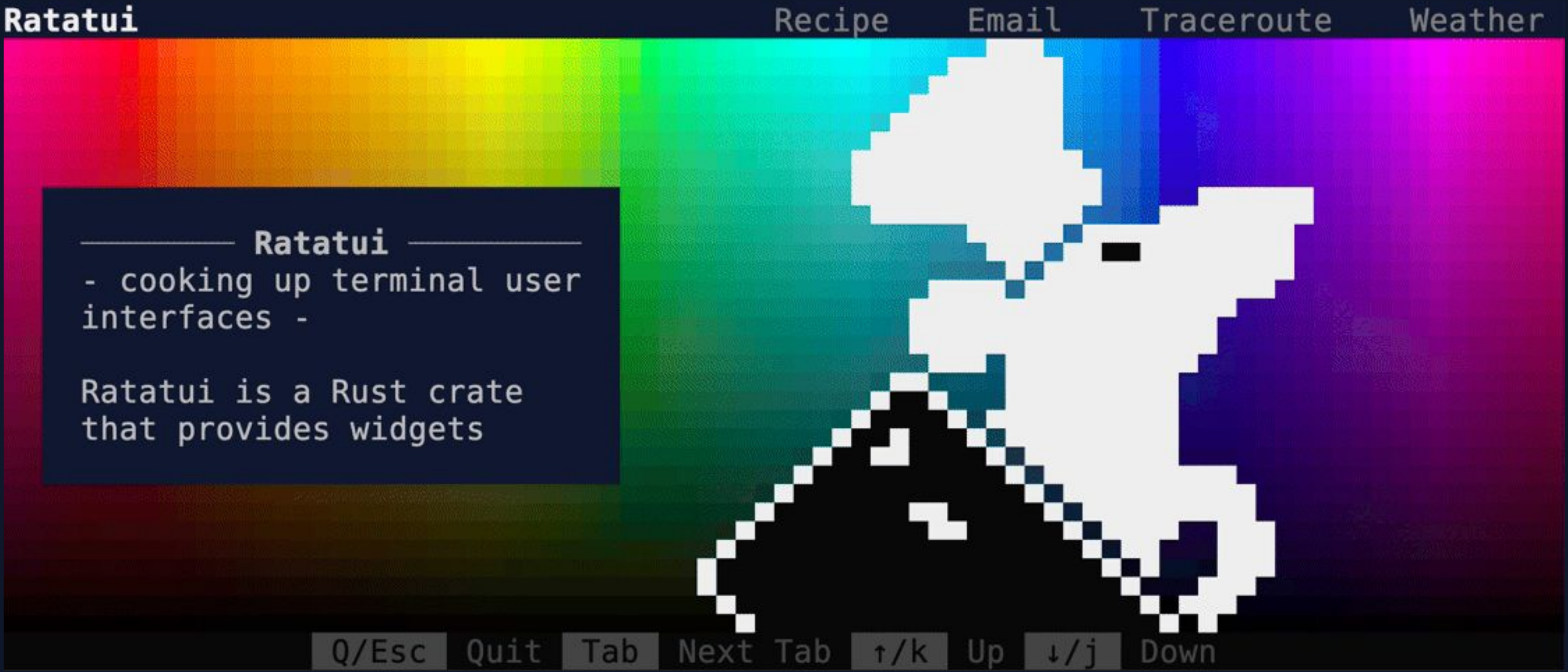


```
Tabs
 Tab0 | Tab1 |

Graphs
Gauge:
                                                    90%
Sparkline:

List                                                 List
> Item1                                              INFO: Event9
  Item2                                              INFO: Event10
  Item3                                              CRITICAL: Event11
  Item4                                              INFO: Event12
  Item5                                              INFO: Event13
  Item6                                              INFO: Event14
  Item7                                              INFO: Event15
  Item8                                              INFO: Event16
  Item9                                              ERROR: Event17
  Item10                                             ERROR: Event18

Bar chart
 5   9   14  15  1        4   6   4   6   4   7   13  8   11  9   3   5   9
 B7  B8  B9  B10 B11 B12  B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 B1

Footer
This is a paragraph with several lines.
You can change the color.
Use {fg=[color];bg=[color];mod=[modifier] [text]} to highlight the text with a color. For exa
Oh, and if you didn't notice you can automatically wrap your text =).
One more thing is that it should display unicode characters properly: 日本国 , ٩(-̮̮̃-̃)۶ ٩(●̮̮̃•̃)۶ ٩
```

2016-2022

Ratatui (community)

2023-present



Ratatui

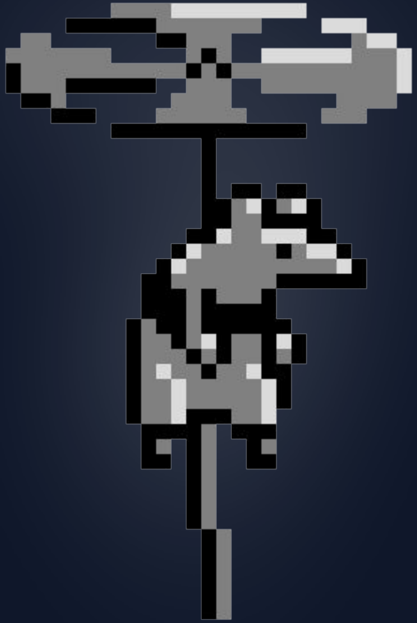
- cooking up terminal user interfaces -

Ratatui is a Rust crate that provides widgets

https://ratatui.rs

lightweight

customizable

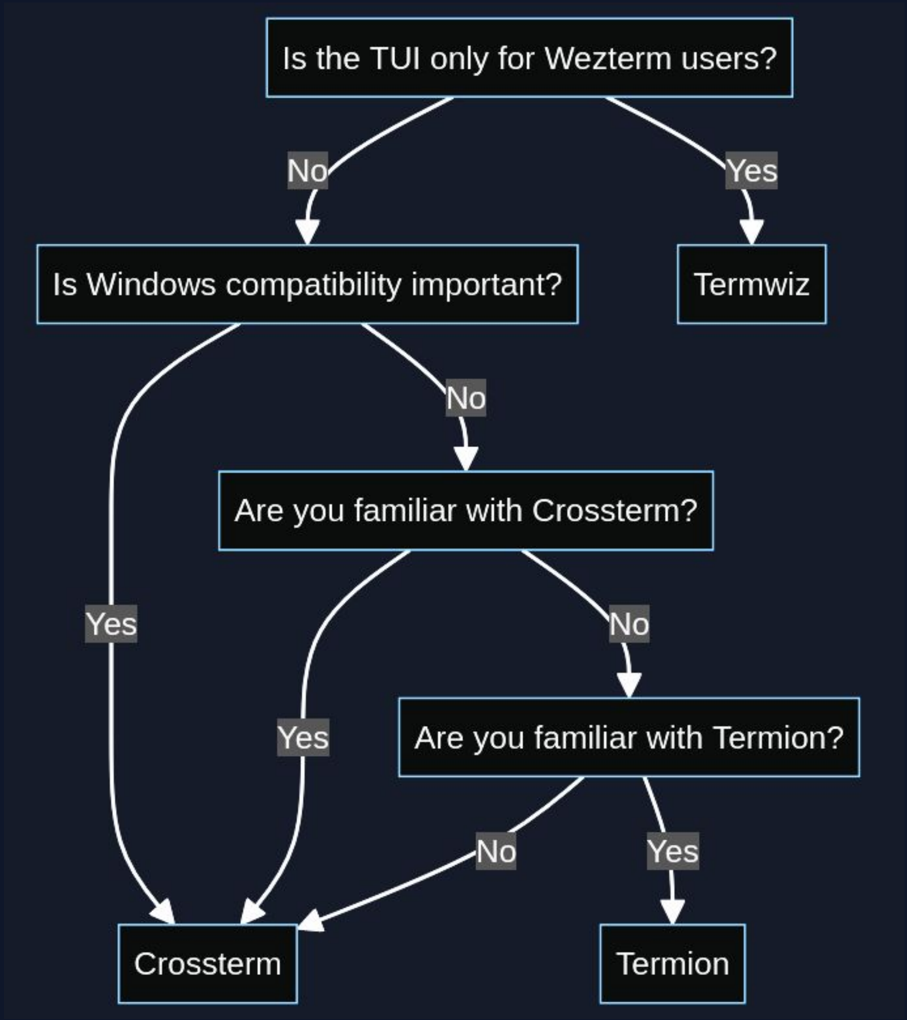


flexible

cool name

Terminal Handling	Rendering UI	Supported Widgets
● Crossterm ● Termion ● Termwiz	Ratatui	Block, BarChart, Calendar, Canvas, Chart, Gauge, LineGauge, List, Paragraph, Scrollbar, Sparkline, Table, Tabs

Crossterm +



Is the TUI only for Wezterm users?

Is Windows compatibility important?

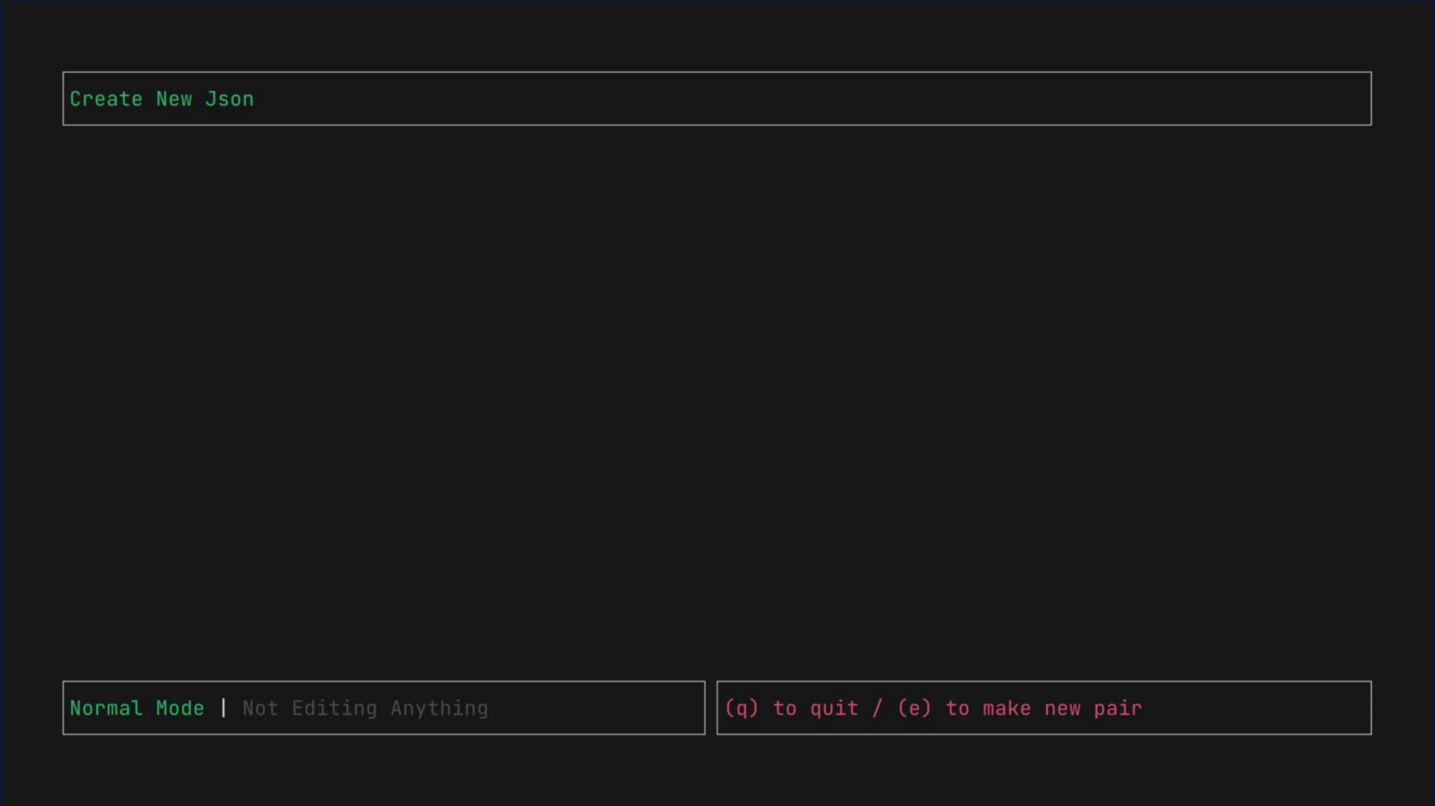
Termwiz

Are you familiar with Crossterm?

Are you familiar with Termion?

Crossterm

Termion



```
Create New Json
```

```
Normal Mode | Not Editing Anything
```

```
(q) to quit / (e) to make new pair
```

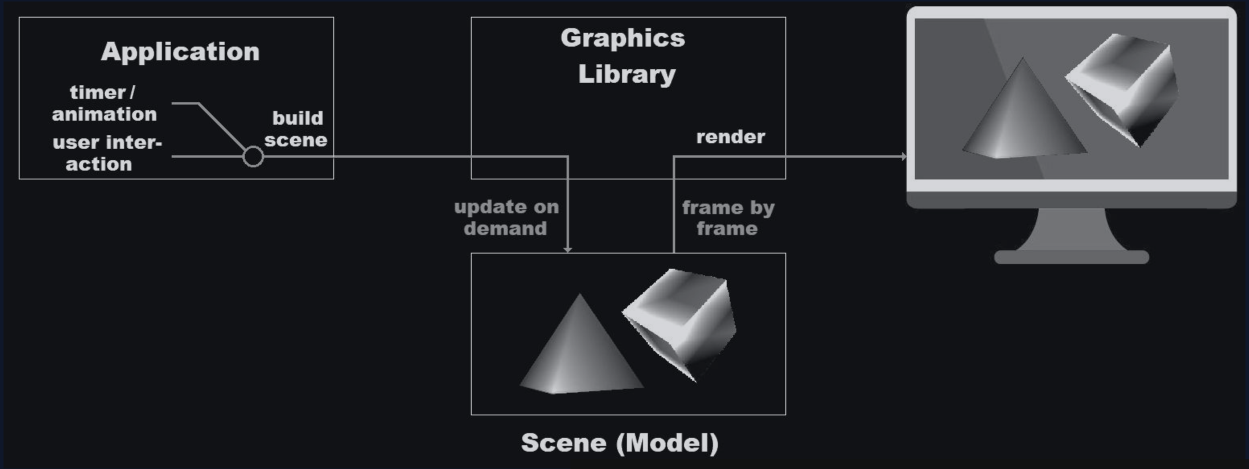
https://ratatui.rs/tutorials

JSON editor application

Concepts

https://ratatui.rs/concepts

Rendering



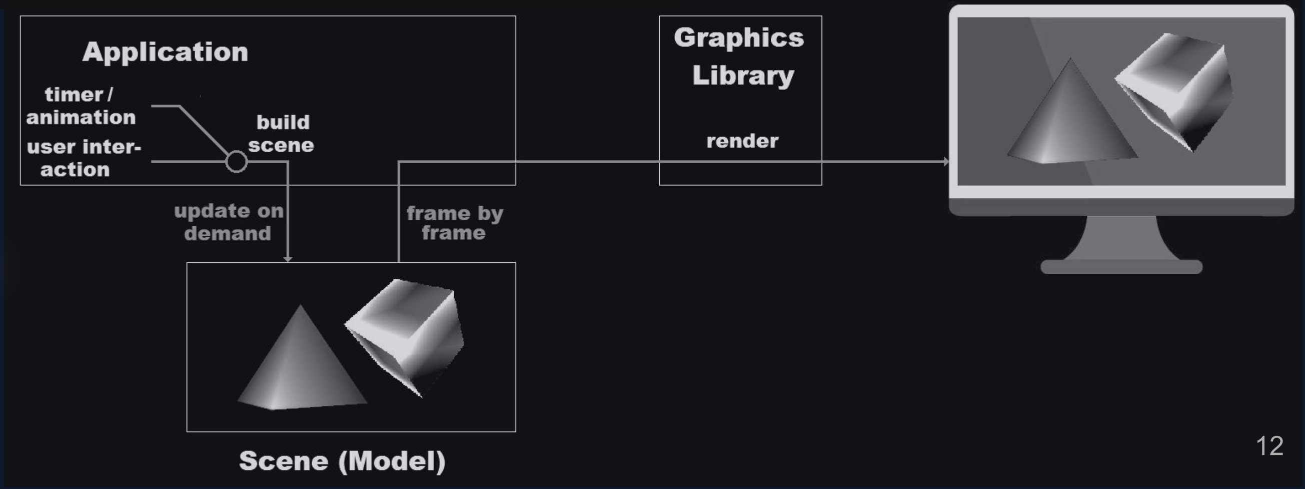
Retained Mode Rendering

Set up your UI once, create widgets, and later modify their properties or handle their events.

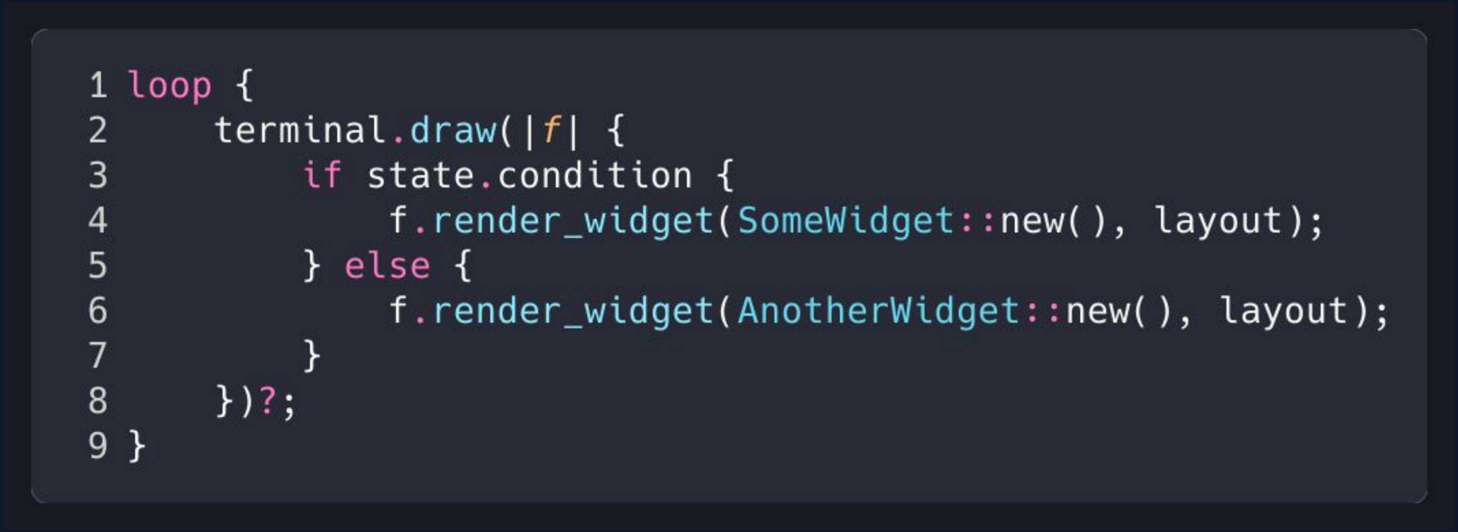
Immediate Mode Rendering

Redraw UI for every frame based on your application state.

There’s no permanent widget object in memory.

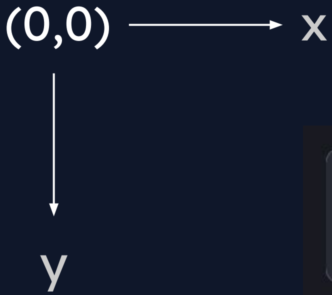


Immediate Mode Rendering

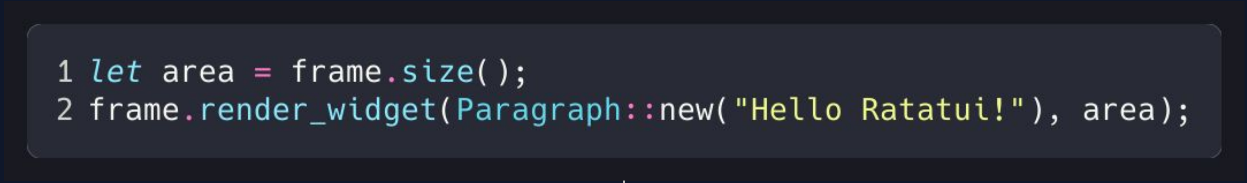


```rust
loop {
    terminal.draw(|f| {
        if state.condition {
            f.render_widget(SomeWidget::new(), layout);
        } else {
            f.render_widget(AnotherWidget::new(), layout);
        }
    })?;
}
```

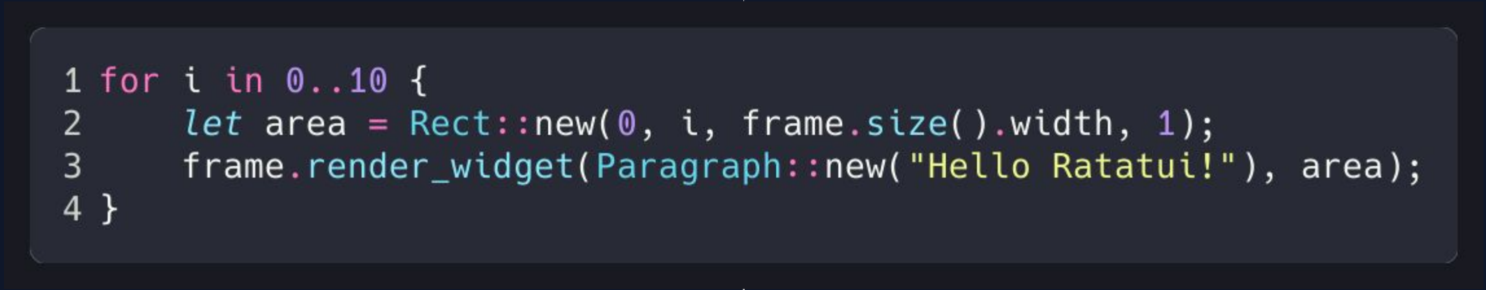
✨



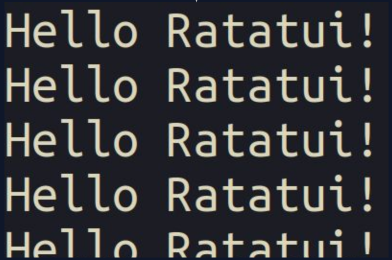
Area (Rect)



```rust
let area = frame.size();
frame.render_widget(Paragraph::new("Hello Ratatui!"), area);
```

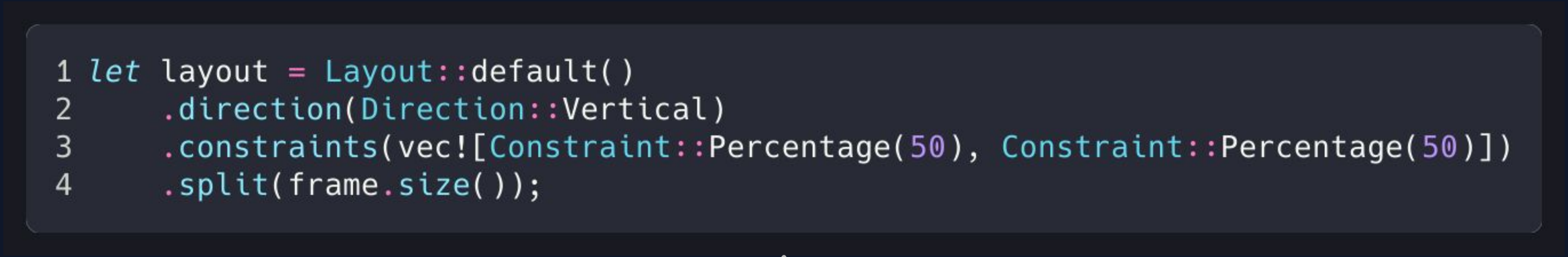


```rust
for i in 0..10 {
    let area = Rect::new(0, i, frame.size().width, 1);
    frame.render_widget(Paragraph::new("Hello Ratatui!"), area);
}
```

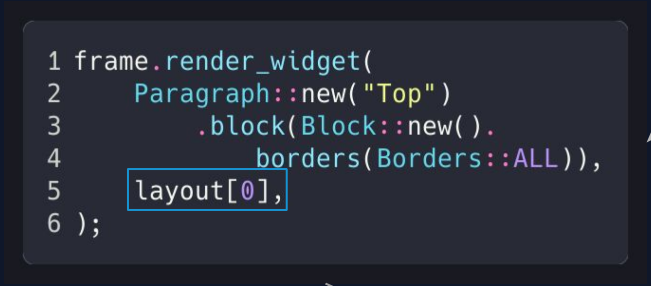


```
Hello Ratatui!
Hello Ratatui!
Hello Ratatui!
Hello Ratatui!
Hello Ratatui!
```

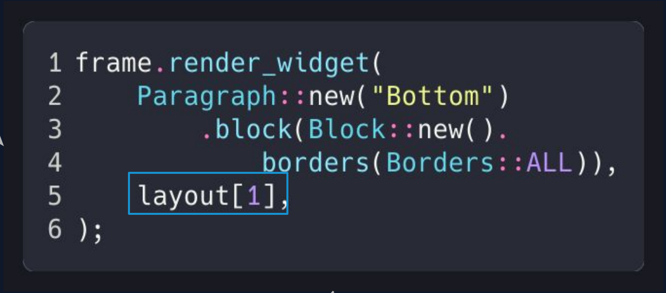
Layout



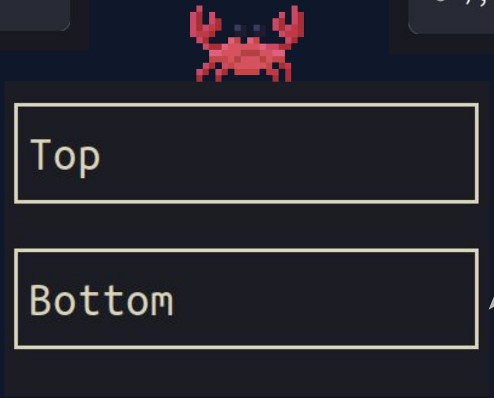
```rust
let layout = Layout::default()
    .direction(Direction::Vertical)
    .constraints(vec![Constraint::Percentage(50), Constraint::Percentage(50)])
    .split(frame.size());
```



```rust
frame.render_widget(
    Paragraph::new("Top")
        .block(Block::new().
            borders(Borders::ALL)),
    layout[0],
);
```

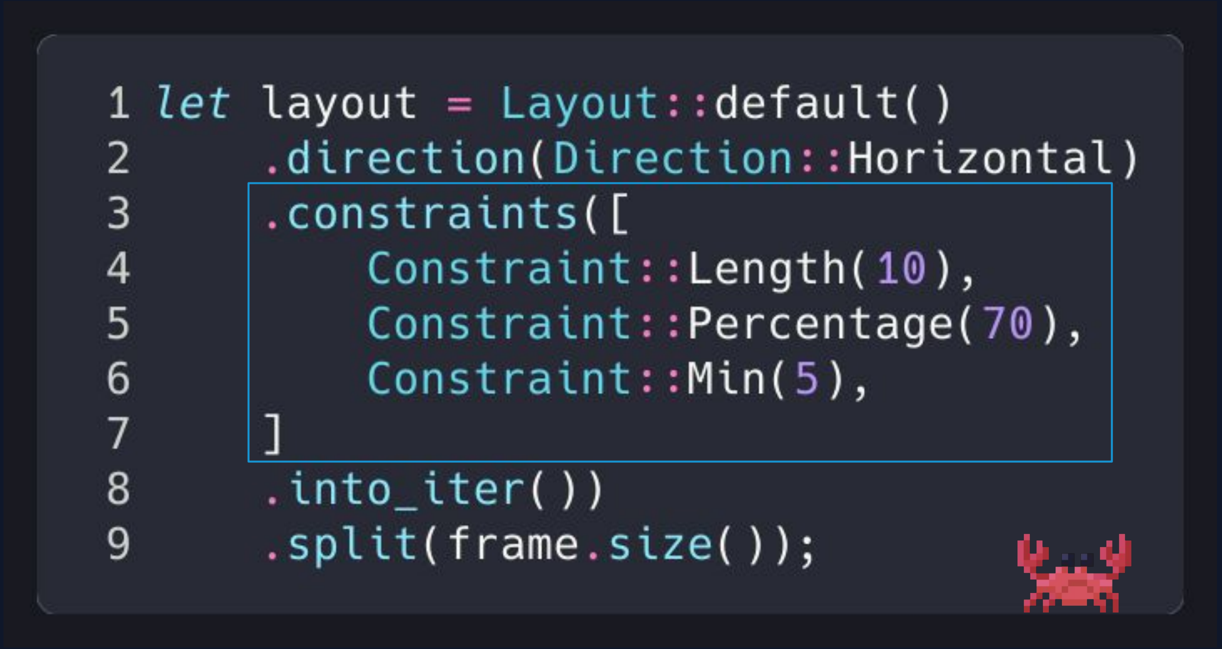


```rust
frame.render_widget(
    Paragraph::new("Bottom")
        .block(Block::new().
            borders(Borders::ALL)),
    layout[1],
);
```



```
Top

Bottom
```

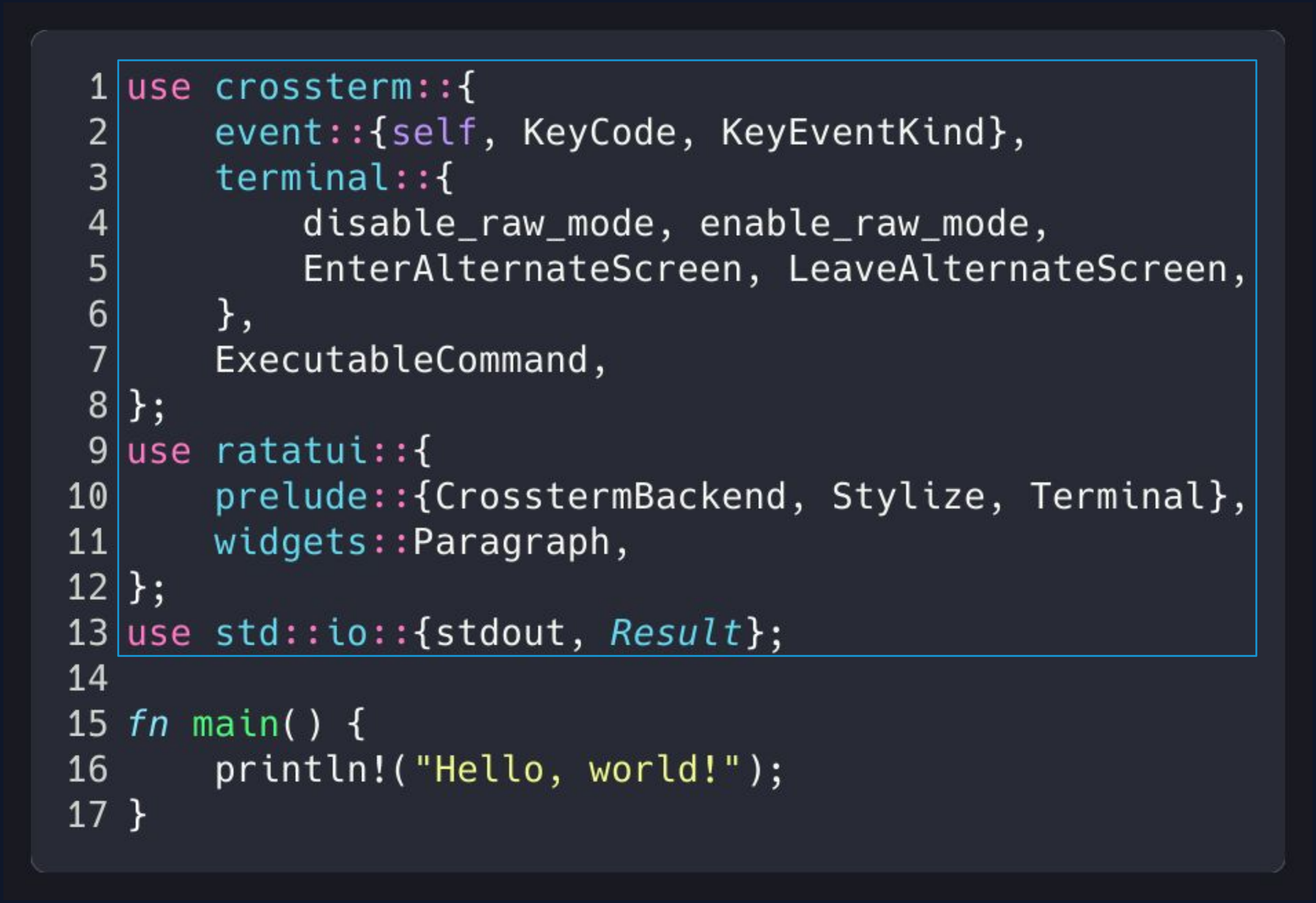
Constraint



```rust
let layout = Layout::default()
    .direction(Direction::Horizontal)
    .constraints([
        Constraint::Length(10),
        Constraint::Percentage(70),
        Constraint::Min(5),
    ]
    .into_iter())
    .split(frame.size());
```

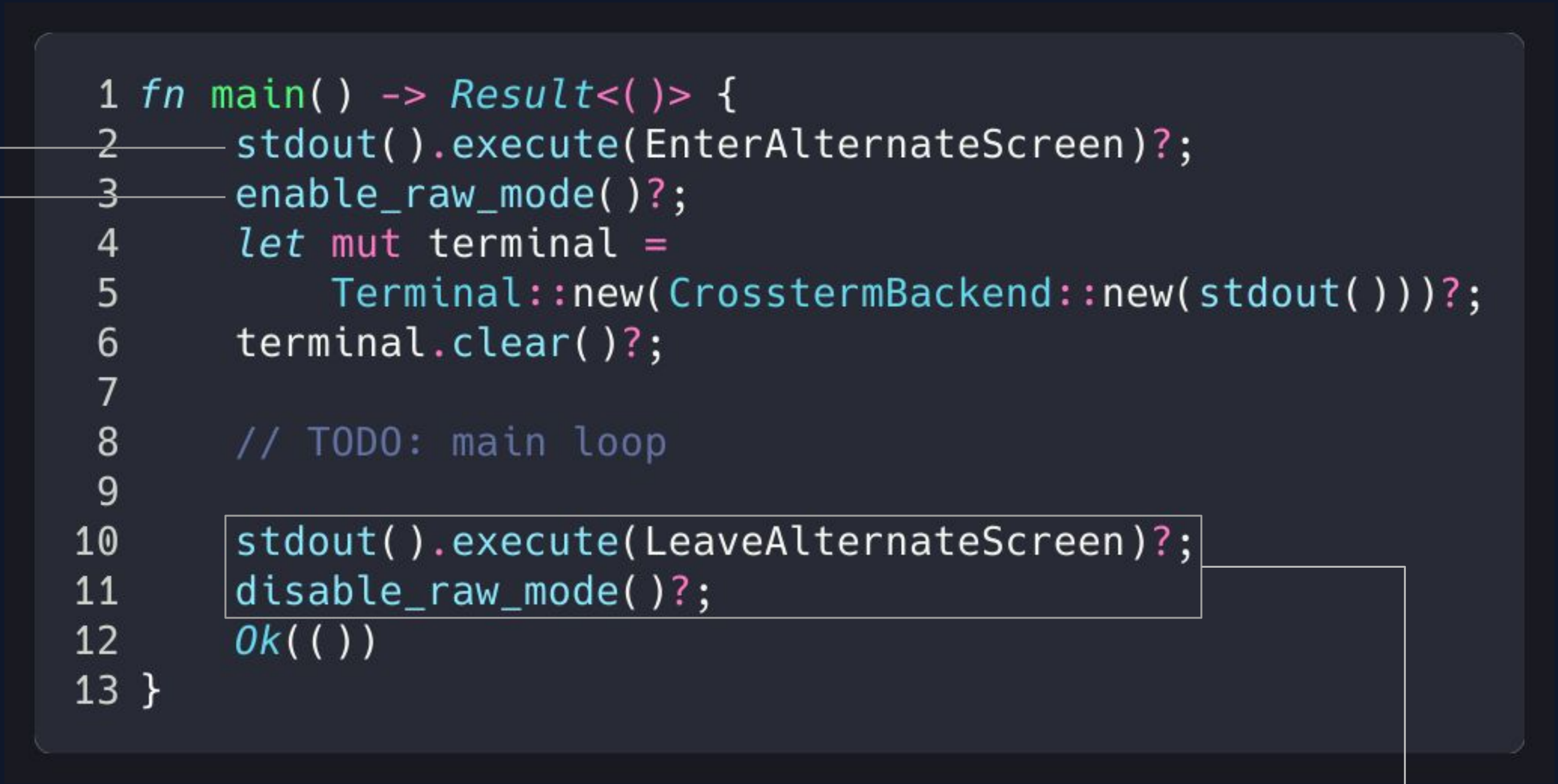
- Constraint::Length(u16)
- Constraint::Percentage(u16)
- Constraint::Ratio(u16, u16)
- Constraint::Min(u16)
- Constraint::Max(u16)

Hello World



```rust
use crossterm::{
    event::{self, KeyCode, KeyEventKind},
    terminal::{
        disable_raw_mode, enable_raw_mode,
        EnterAlternateScreen, LeaveAlternateScreen,
    },
    ExecutableCommand,
};
use ratatui::{
    prelude::{CrosstermBackend, Stylize, Terminal},
    widgets::Paragraph,
};
use std::io::{stdout, Result};

fn main() {
    println!("Hello, world!");
}
```

src/main.rs

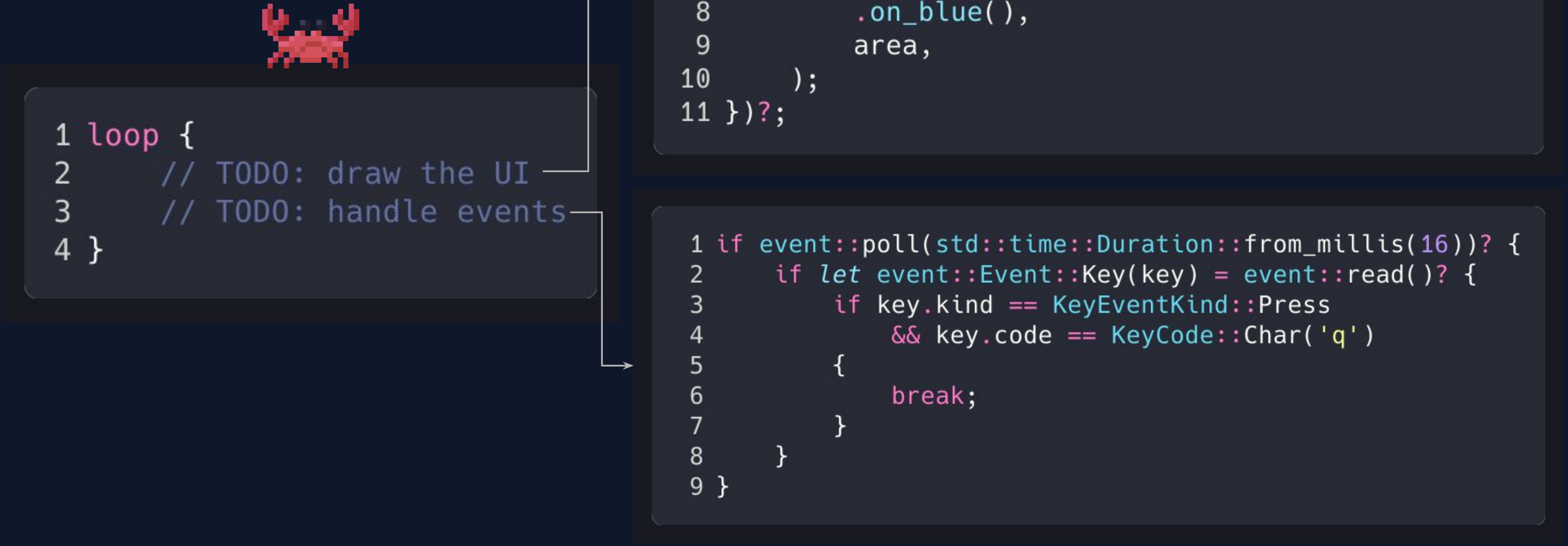


```rust
fn main() -> Result<()> {
    stdout().execute(EnterAlternateScreen)?;
    enable_raw_mode()?;
    let mut terminal =
        Terminal::new(CrosstermBackend::new(stdout()))?;
    terminal.clear()?;

    // TODO: main loop

    stdout().execute(LeaveAlternateScreen)?;
    disable_raw_mode()?;
    Ok(())
}
```

restore

enter secondary screen to not disturb normal output

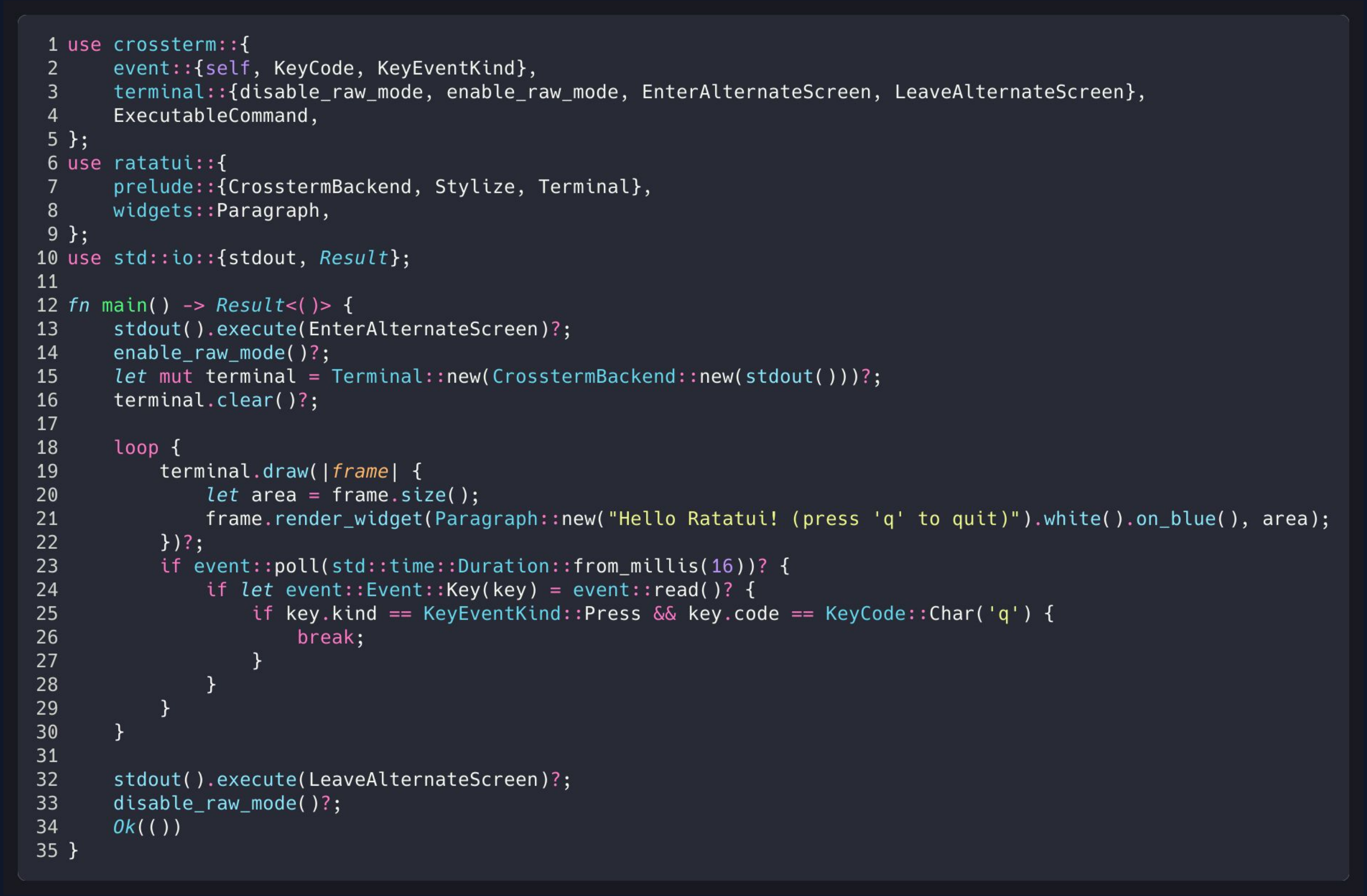
turn off I/O for full control over the terminal (*cooked mode!*)



```rust
loop {
    // TODO: draw the UI
    // TODO: handle events
}
```

```rust
terminal.draw(|frame| {
    let area = frame.size();
    frame.render_widget(
        Paragraph::new(
            "Hello Ratatui! (press 'q' to quit)",
        )
        .white()
        .on_blue(),
        area,
    );
})?;
```

```rust
if event::poll(std::time::Duration::from_millis(16))? {
    if let event::Event::Key(key) = event::read()? {
        if key.kind == KeyEventKind::Press
            && key.code == KeyCode::Char('q')
        {
            break;
        }
    }
}
```



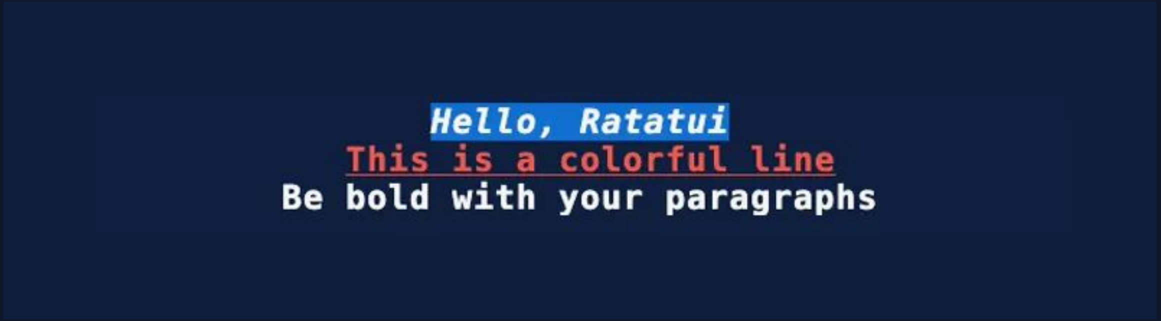
```rust
use crossterm::{
    event::{self, KeyCode, KeyEventKind},
    terminal::{disable_raw_mode, enable_raw_mode, EnterAlternateScreen, LeaveAlternateScreen},
    ExecutableCommand,
};
use ratatui::{
    prelude::{CrosstermBackend, Stylize, Terminal},
    widgets::Paragraph,
};
use std::io::{stdout, Result};

fn main() -> Result<()> {
    stdout().execute(EnterAlternateScreen)?;
    enable_raw_mode()?;
    let mut terminal = Terminal::new(CrosstermBackend::new(stdout()))?;
    terminal.clear()?;

    loop {
        terminal.draw(|frame| {
            let area = frame.size();
            frame.render_widget(Paragraph::new("Hello Ratatui! (press 'q' to quit)").white().on_blue(), area);
        })?;
        if event::poll(std::time::Duration::from_millis(16))? {
            if let event::Event::Key(key) = event::read()? {
                if key.kind == KeyEventKind::Press && key.code == KeyCode::Char('q') {
                    break;
                }
            }
        }
    }

    stdout().execute(LeaveAlternateScreen)?;
    disable_raw_mode()?;
    Ok(())
}
```

Hello world | Ratatui.rs

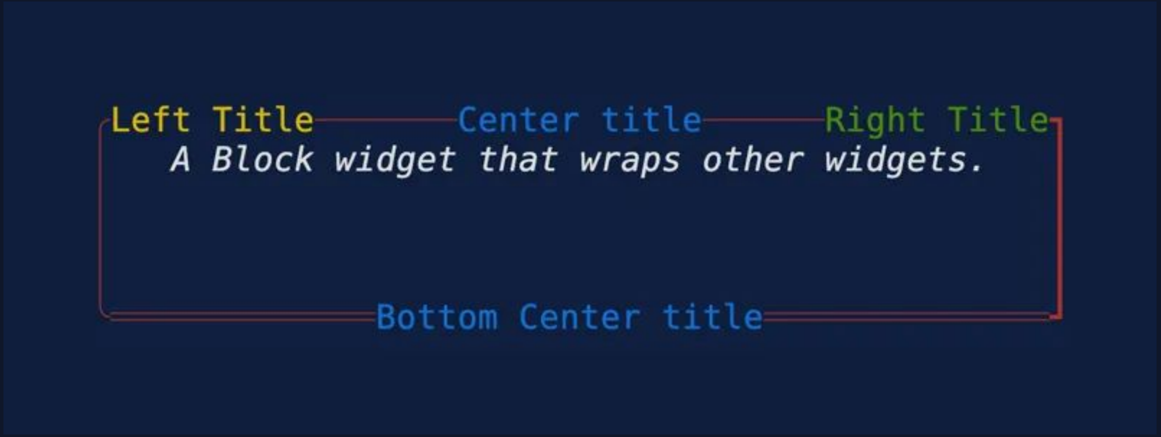
```
> c
```

🥳

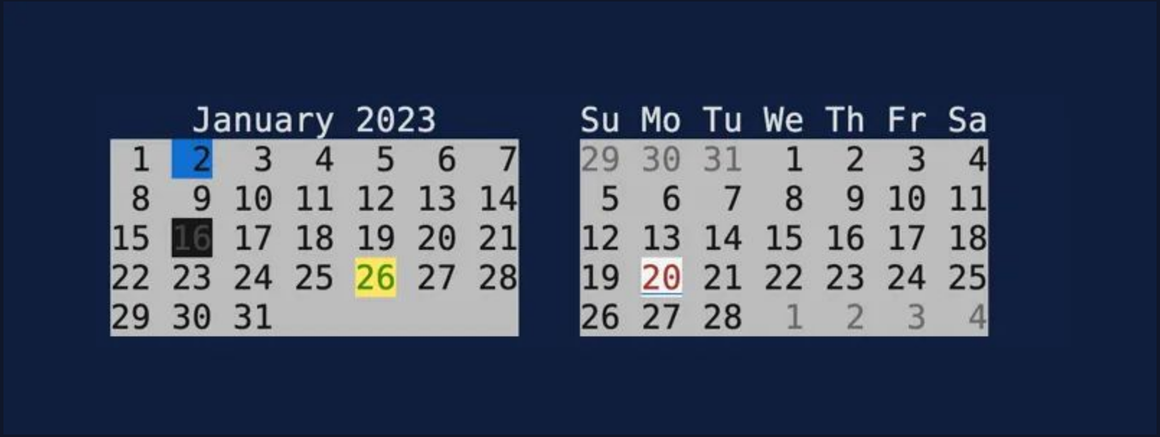
Showcase



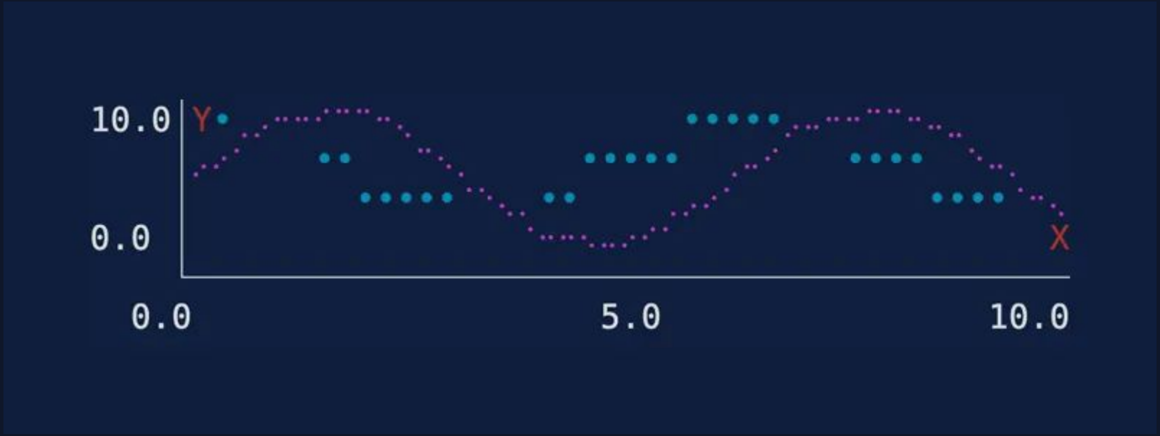
```
      Hello, Ratatui
 This is a colorful line
Be bold with your paragraphs
```

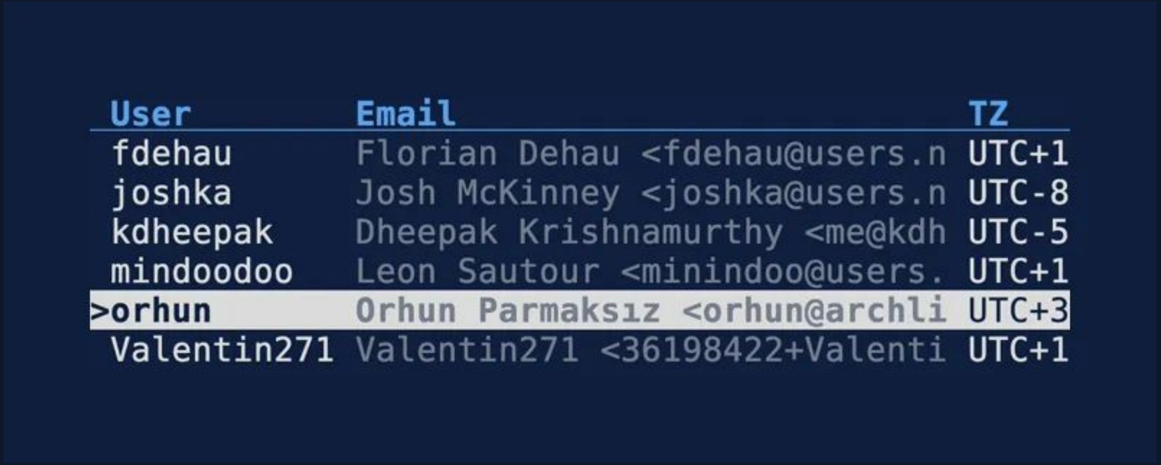


```
Left Title        Center title        Right Title
  A Block widget that wraps other widgets.



             Bottom Center title
```

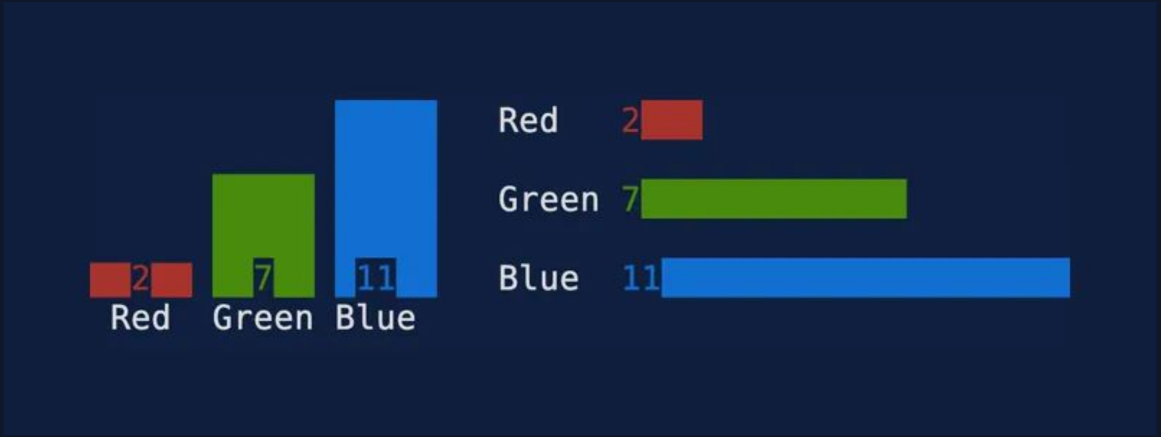


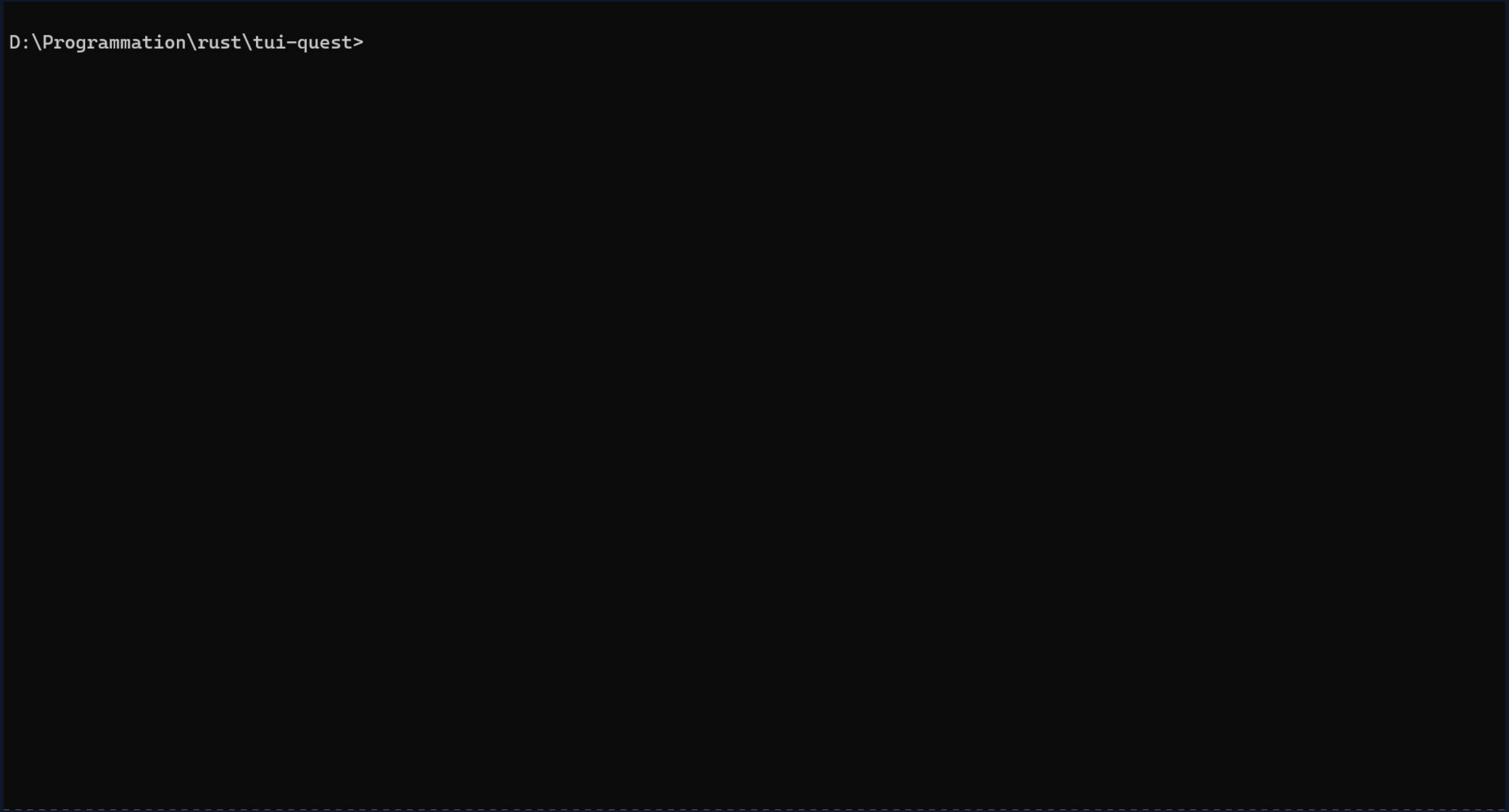
```
   January 2023          Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7     29 30 31  1  2  3  4
 8  9 10 11 12 13 14      5  6  7  8  9 10 11
15 16 17 18 19 20 21     12 13 14 15 16 17 18
22 23 24 25 26 27 28     19 20 21 22 23 24 25
29 30 31                 26 27 28  1  2  3  4
```





```
 User        Email                               TZ
 fdehau      Florian Dehau <fdehau@users.n      UTC+1
 joshka      Josh McKinney <joshka@users.n      UTC-8
 kdheepak    Dheepak Krishnamurthy <me@kdh      UTC-5
 mindoodoo   Leon Sautour <minindoo@users.      UTC+1
>orhun       Orhun Parmaksız <orhun@archli      UTC+3
 Valentin271 Valentin271 <36198422+Valenti      UTC+1
```

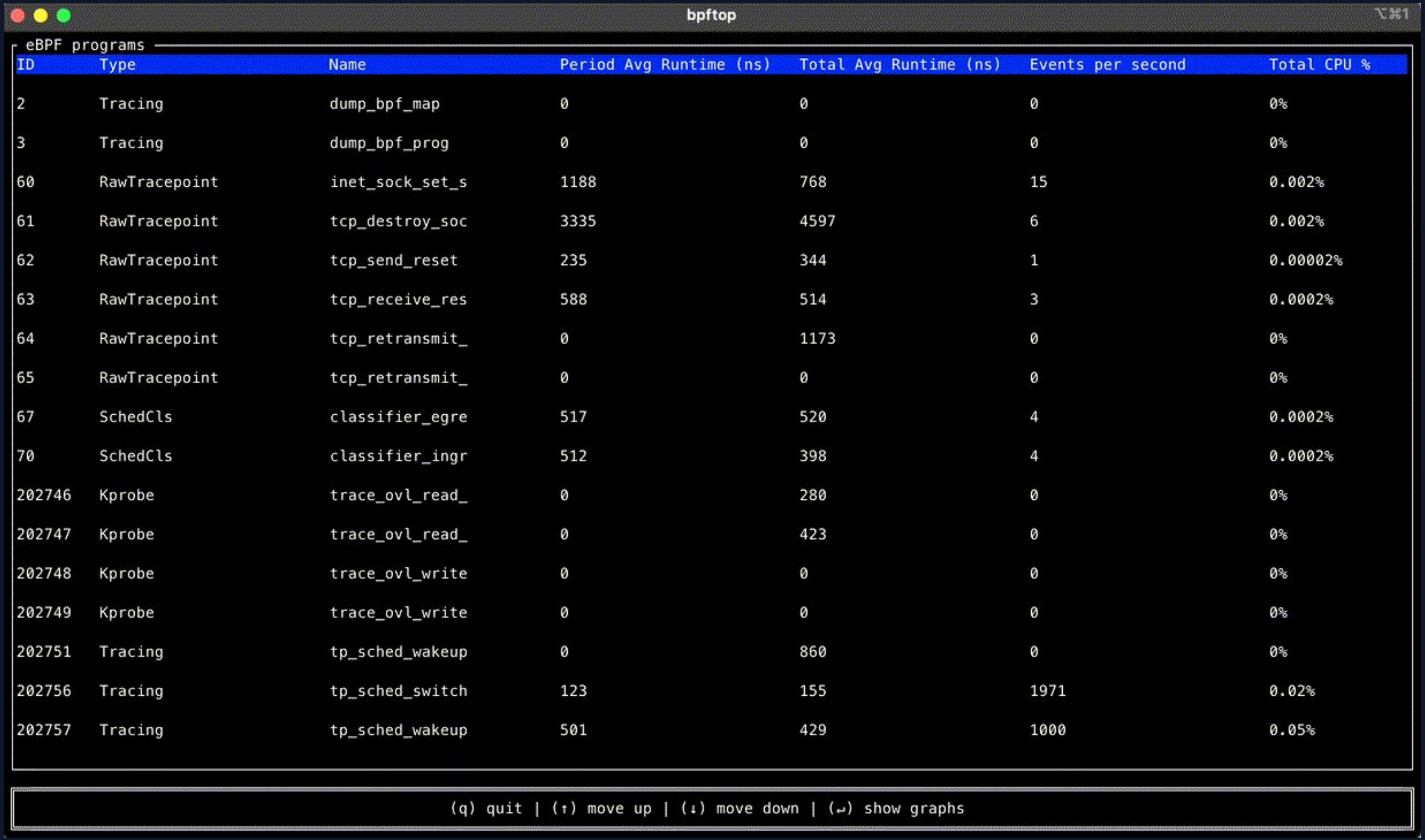




```
D:\Programmation\rust\tui-quest>
```

ATAC

https://github.com/Julien-cpsn/ATAC



```
eBPF programs
ID        Type                     Name                     Period Avg Runtime (ns)  Total Avg Runtime (ns)  Events per second          Total CPU %

2         Tracing                  dump_bpf_map             0                        0                       0                          0%

3         Tracing                  dump_bpf_prog            0                        0                       0                          0%

60        RawTracepoint            inet_sock_set_s          1188                     768                     15                         0.002%

61        RawTracepoint            tcp_destroy_soc          3335                     4597                    6                          0.002%

62        RawTracepoint            tcp_send_reset           235                      344                     1                          0.00002%

63        RawTracepoint            tcp_receive_res          588                      514                     3                          0.0002%

64        RawTracepoint            tcp_retransmit_          0                        1173                    0                          0%

65        RawTracepoint            tcp_retransmit_          0                        0                       0                          0%

67        SchedCls                 classifier_egre          517                      520                     4                          0.0002%

70        SchedCls                 classifier_ingr          512                      398                     4                          0.0002%

202746    Kprobe                   trace_ovl_read_          0                        280                     0                          0%

202747    Kprobe                   trace_ovl_read_          0                        423                     0                          0%

202748    Kprobe                   trace_ovl_write          0                        0                       0                          0%

202749    Kprobe                   trace_ovl_write          0                        0                       0                          0%

202751    Tracing                  tp_sched_wakeup          0                        860                     0                          0%

202756    Tracing                  tp_sched_switch          123                      155                     1971                       0.02%

202757    Tracing                  tp_sched_wakeup          501                      429                     1000                       0.05%


                       (q) quit | (↑) move up | (↓) move down | (↵) show graphs
```

bpftop

https://github.com/Netflix/bpftop

```
(orhun ζ ~) 
```

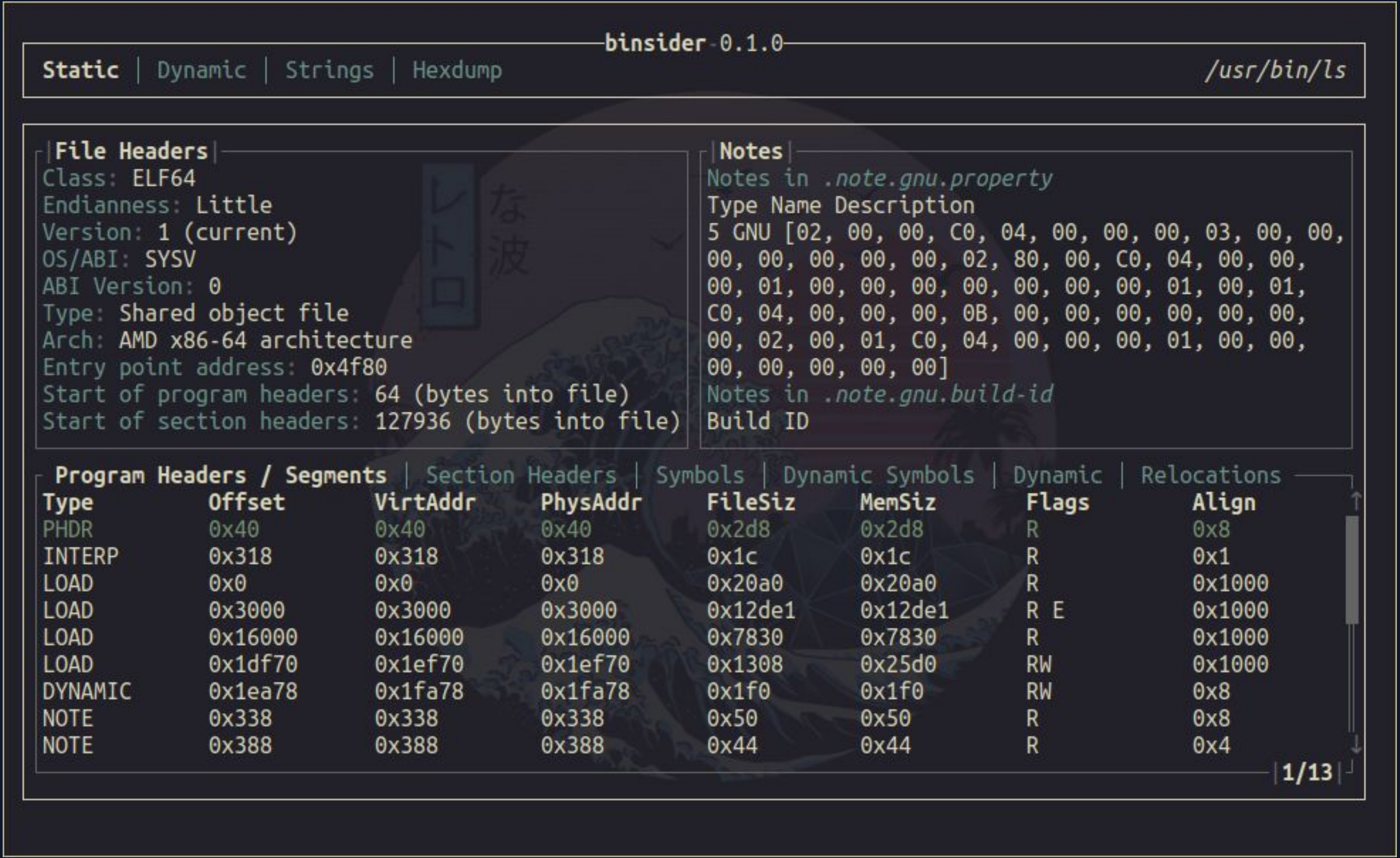
poketex

https://github.com/ckaznable/poketex

```
>
```

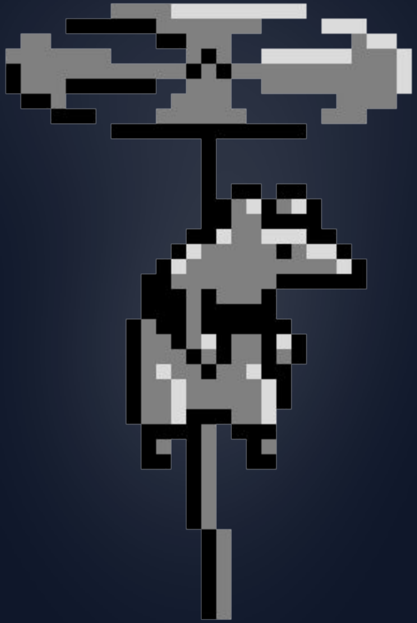
flawz

https://github.com/orhun/flawz

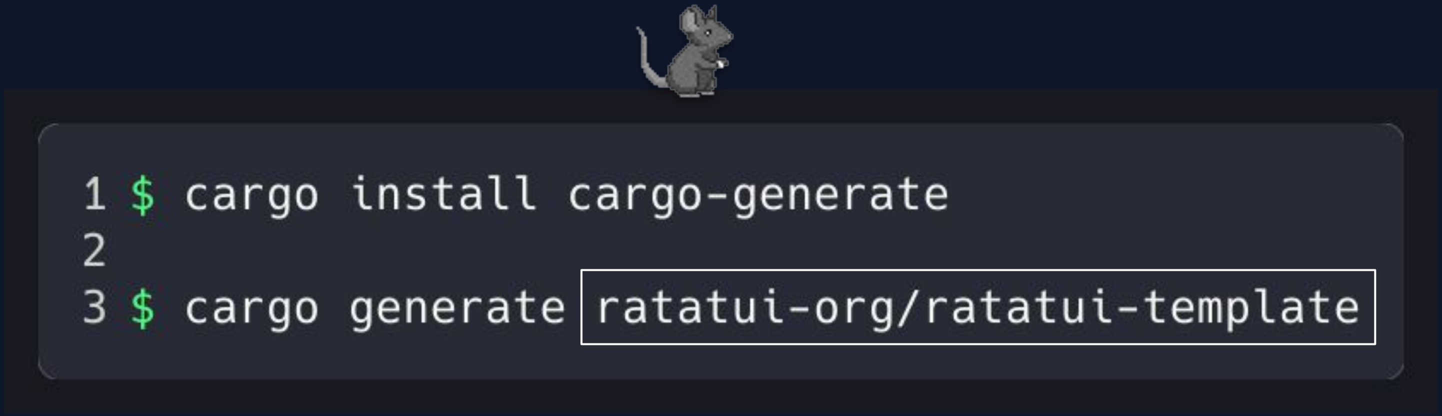


```
binsider 0.1.0
 Static | Dynamic | Strings | Hexdump                                                    /usr/bin/ls

 File Headers                                          Notes
 Class: ELF64                                          Notes in .note.gnu.property
 Endianness: Little                                    Type Name Description
 Version: 1 (current)                                  5 GNU [02, 00, 00, C0, 04, 00, 00, 00, 03, 00, 00,
 OS/ABI: SYSV                                          00, 00, 00, 00, 00, 02, 80, 00, C0, 04, 00, 00,
 ABI Version: 0                                        00, 01, 00, 00, 00, 00, 00, 00, 00, 01, 00, 01,
 Type: Shared object file                              C0, 04, 00, 00, 00, 0B, 00, 00, 00, 00, 00, 00,
 Arch: AMD x86-64 architecture                         00, 02, 00, 01, C0, 04, 00, 00, 00, 01, 00, 00,
 Entry point address: 0x4f80                           00, 00, 00, 00, 00]
 Start of program headers: 64 (bytes into file)        Notes in .note.gnu.build-id
 Start of section headers: 127936 (bytes into file)    Build ID

 Program Headers / Segments | Section Headers | Symbols | Dynamic Symbols | Dynamic | Relocations
 Type        Offset      VirtAddr    PhysAddr    FileSiz     MemSiz      Flags       Align
 PHDR        0x40        0x40        0x40        0x2d8       0x2d8       R           0x8
 INTERP      0x318       0x318       0x318       0x1c        0x1c        R           0x1
 LOAD        0x0         0x0         0x0         0x20a0      0x20a0      R           0x1000
 LOAD        0x3000      0x3000      0x3000      0x12de1     0x12de1     R E         0x1000
 LOAD        0x16000     0x16000     0x16000     0x7830      0x7830      R           0x1000
 LOAD        0x1df70     0x1ef70     0x1ef70     0x1308      0x25d0      RW          0x1000
 DYNAMIC     0x1ea78     0x1fa78     0x1fa78     0x1f0       0x1f0       RW          0x8
 NOTE        0x338       0x338       0x338       0x50        0x50        R           0x8
 NOTE        0x388       0x388       0x388       0x44        0x44        R           0x4
                                                                                          1/13
```

https://github.com/orhun/binsider 🤫

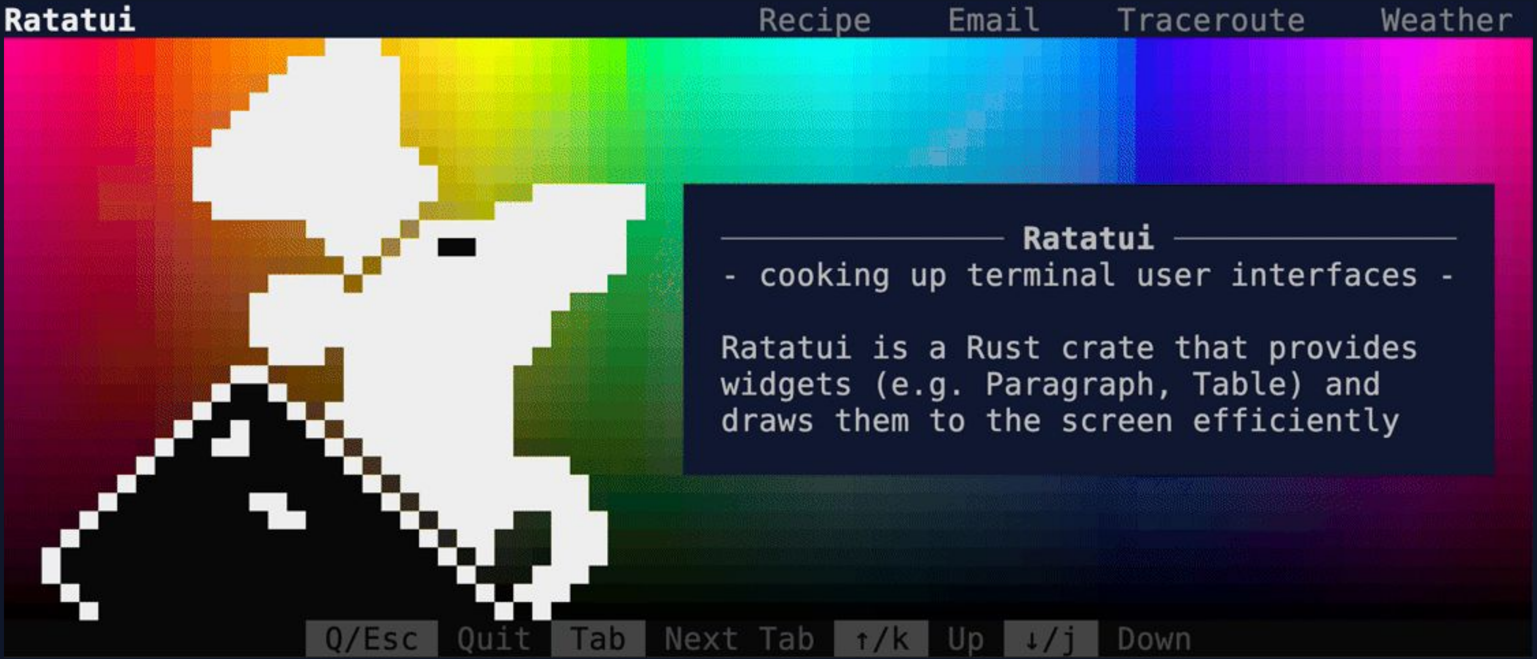


https://github.com/ratatui-org/awesome-ratatui



```
$ cargo install cargo-generate

$ cargo generate ratatui-org/ratatui-template
```

- 🔧 Simple
- 🔄 Simple Async
- 🧩 Component



Ratatui

- cooking up terminal user interfaces -

Ratatui is a Rust crate that provides widgets (e.g. Paragraph, Table) and draws them to the screen efficiently

https://github.com/ratatui-org/ratatui

💖 https://github.com/sponsors/ratatui-org

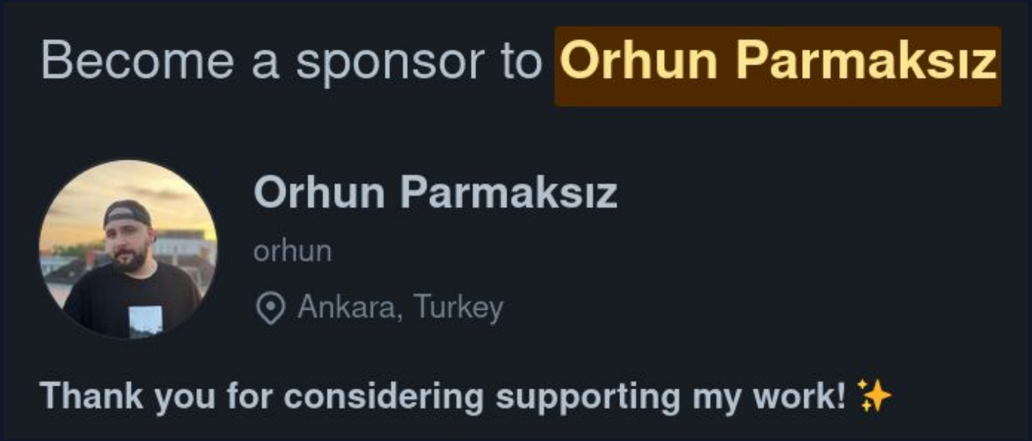
Join our Discord!

Or Matrix!

Links

https://github.com/orhun

https://github.com/ratatui-org



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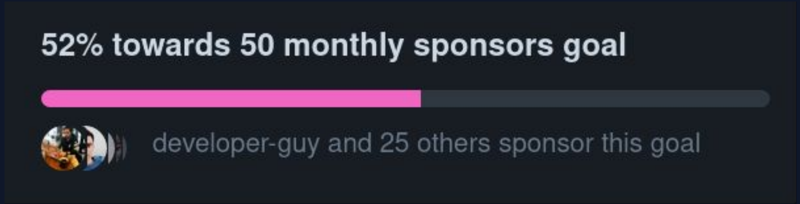

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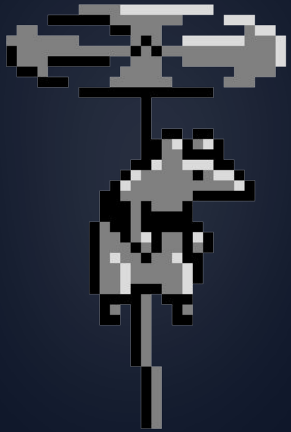

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