Dates in JavaScript

Tackling Temporal Troubles

2025-06-10

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they/them

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01

The Trouble with Times

10 June 2025

```
new Date('2025-06-10')
```

Hamburg:

```
Tue Jun 10 2025 02:00:00 GMT+0200 (CEST)
```

Los Angeles:

```
Mon Jun 09 2025 17:00:00 GMT-0700 (PDT)
```

```
new Date('2025-06-10')
  .toISOString()
```

2025-06-10T00:00:00.000Z

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```
new Date('2025-06-10')
  .toLocaleDateString('en-UK', {
    dateStyle: 'full',
  })
```

Hamburg:

Tuesday, 10 June 2025

Los Angeles:

Monday, 9 June 2025

```
new Date('2025-06-10')
  .toLocaleDateString('en-UK', {
    dateStyle: 'full',
    timeZone: 'UTC',
  })
```

Tuesday, 10 June 2025

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Hit list of bad Date API design

01

Limited time zone support

UTC and user's system time zone. Should be enough, right?

02

Mutability

Don't forget to clone your date object or face the consequences.

03

Few high-level API methods

Want to do calculations with dates? Good luck!

04

Design inconsistencies

Zero-based months and the infamous getYear, anyone?

```
new Date().getYear()
→ 125
```

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How did we end up here?

A white dude thought he is superman

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02

Time for Temporal Technology

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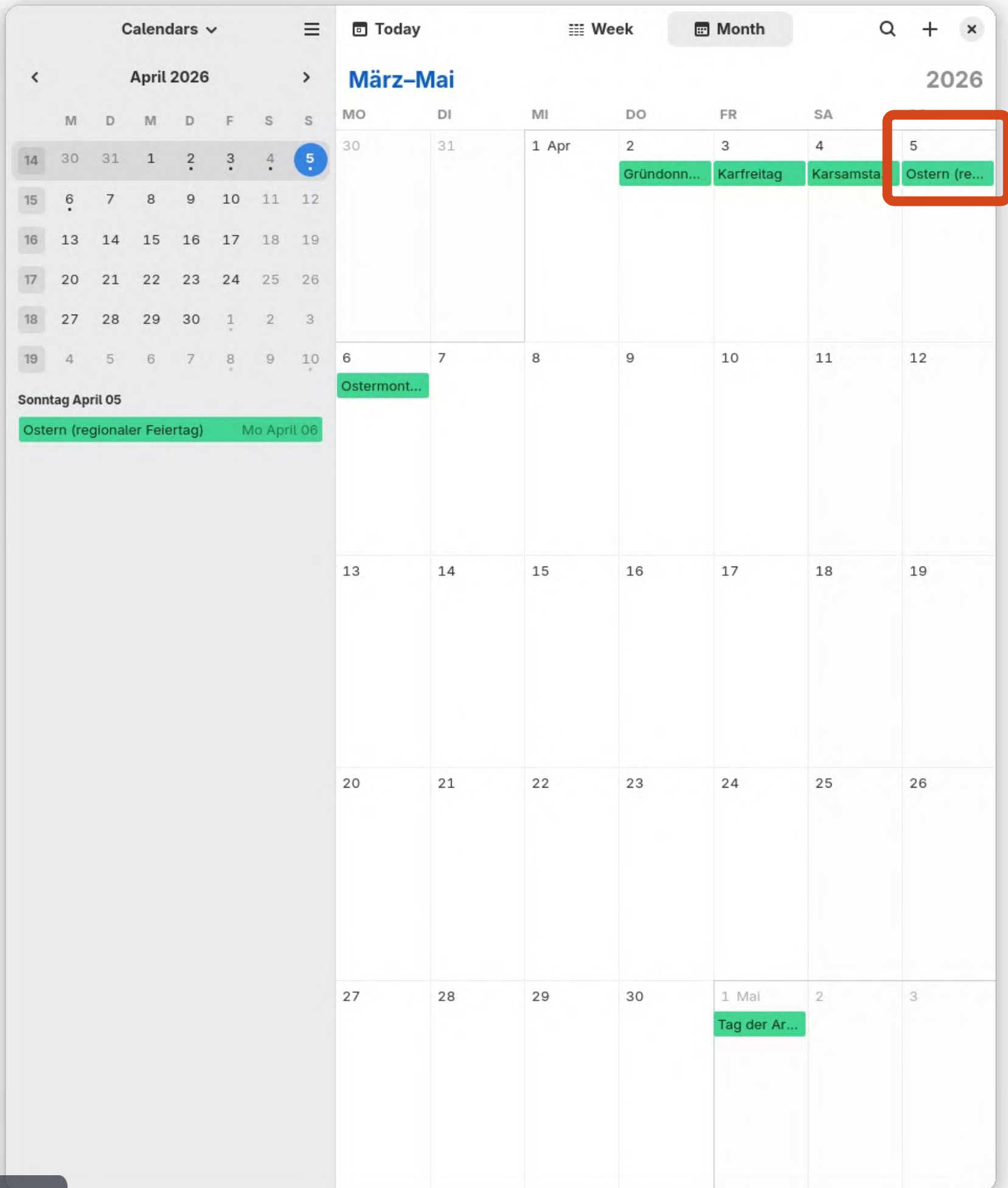
10 June 2025

```
Temporal.PlainDate.from('2025-06-10')
```

2025-06-10

```
Temporal.PlainDate.from('2025-06-10')
  .toLocaleString('en-UK', {
    dateStyle: 'full'
  })
```
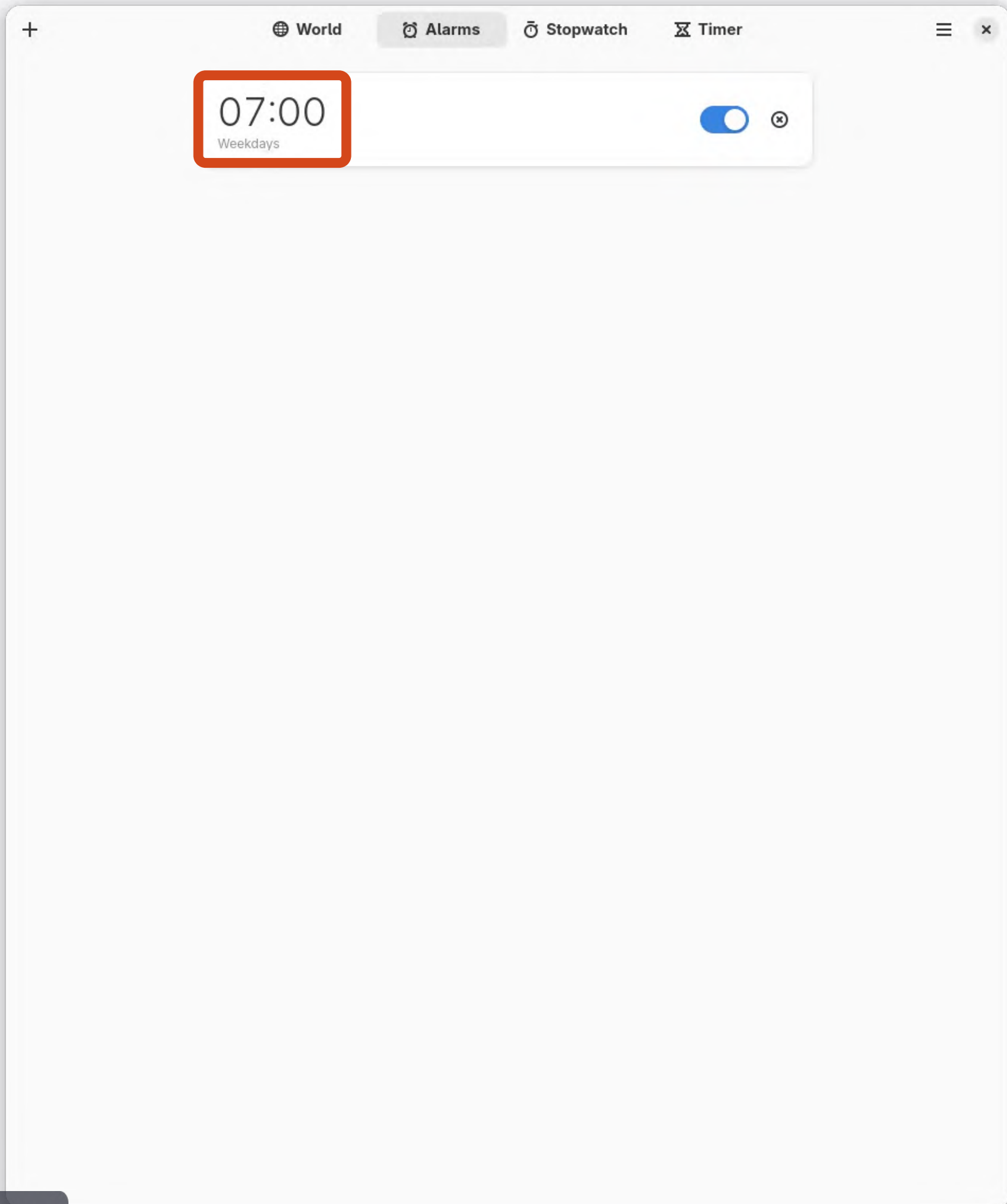
Tuesday, 10 June 2025

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Real world use cases?

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Plain dates

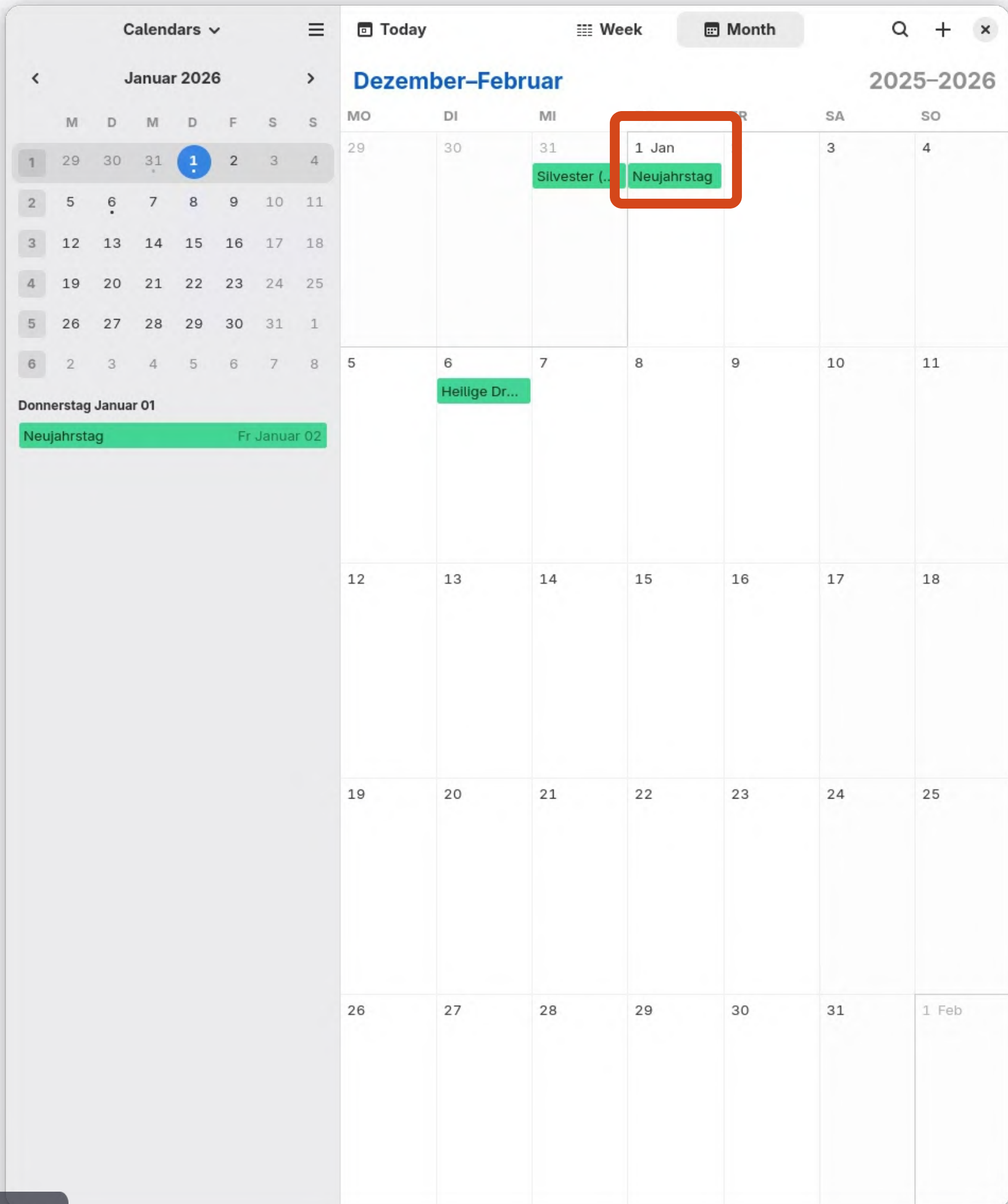# Calendar day

```
const easter =

    Temporal.PlainDate

        .from('2026-04-05')
```

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Plain dates

Wall-clock time

```
const alarm =
    Temporal.PlainTime
        .from('07:00')
```
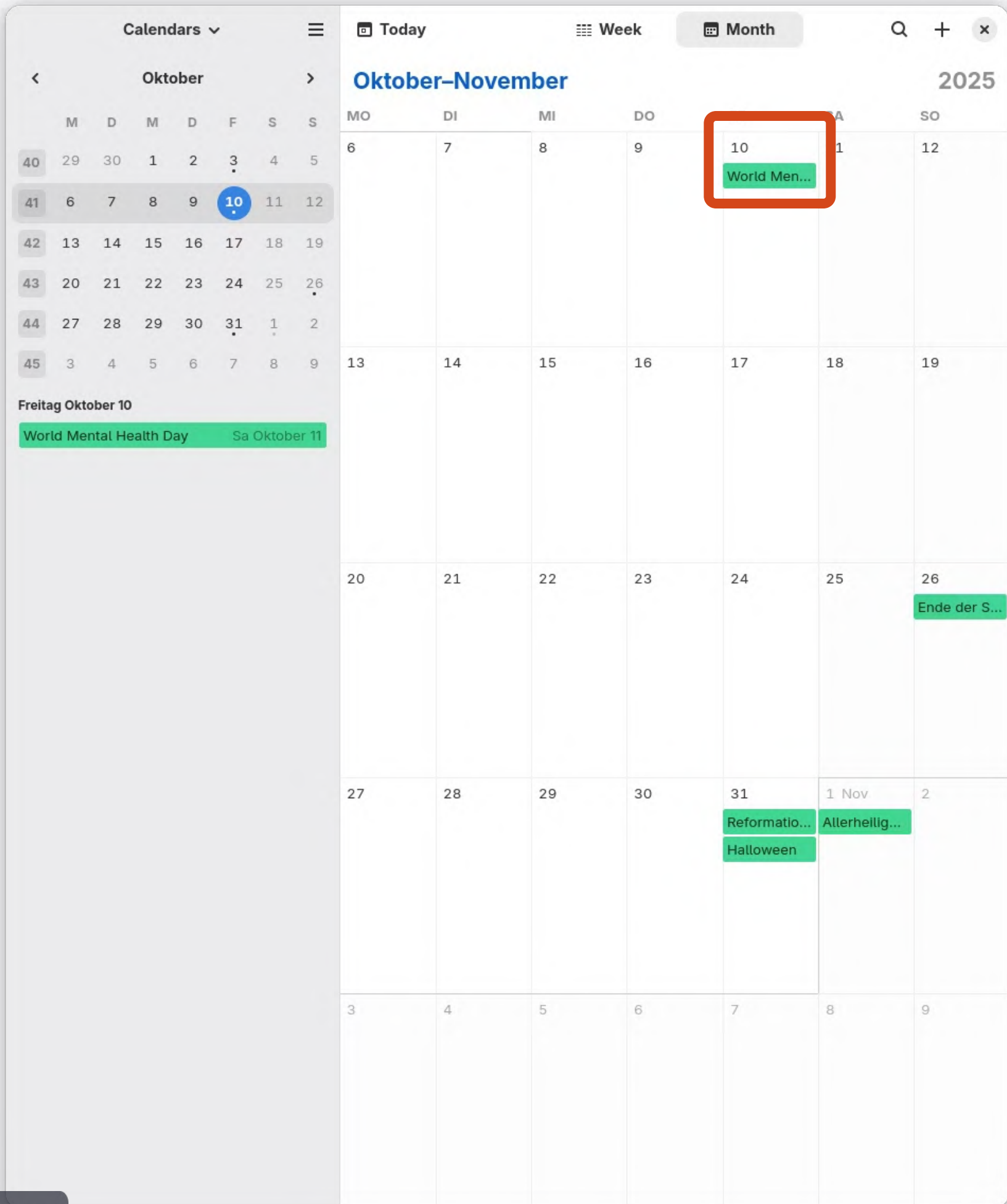
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Plain dates

Calendar day and wall-clock time

```
const newYear =
    Temporal.PlainDateTime
        .from('2026-01-01T00:00')
```
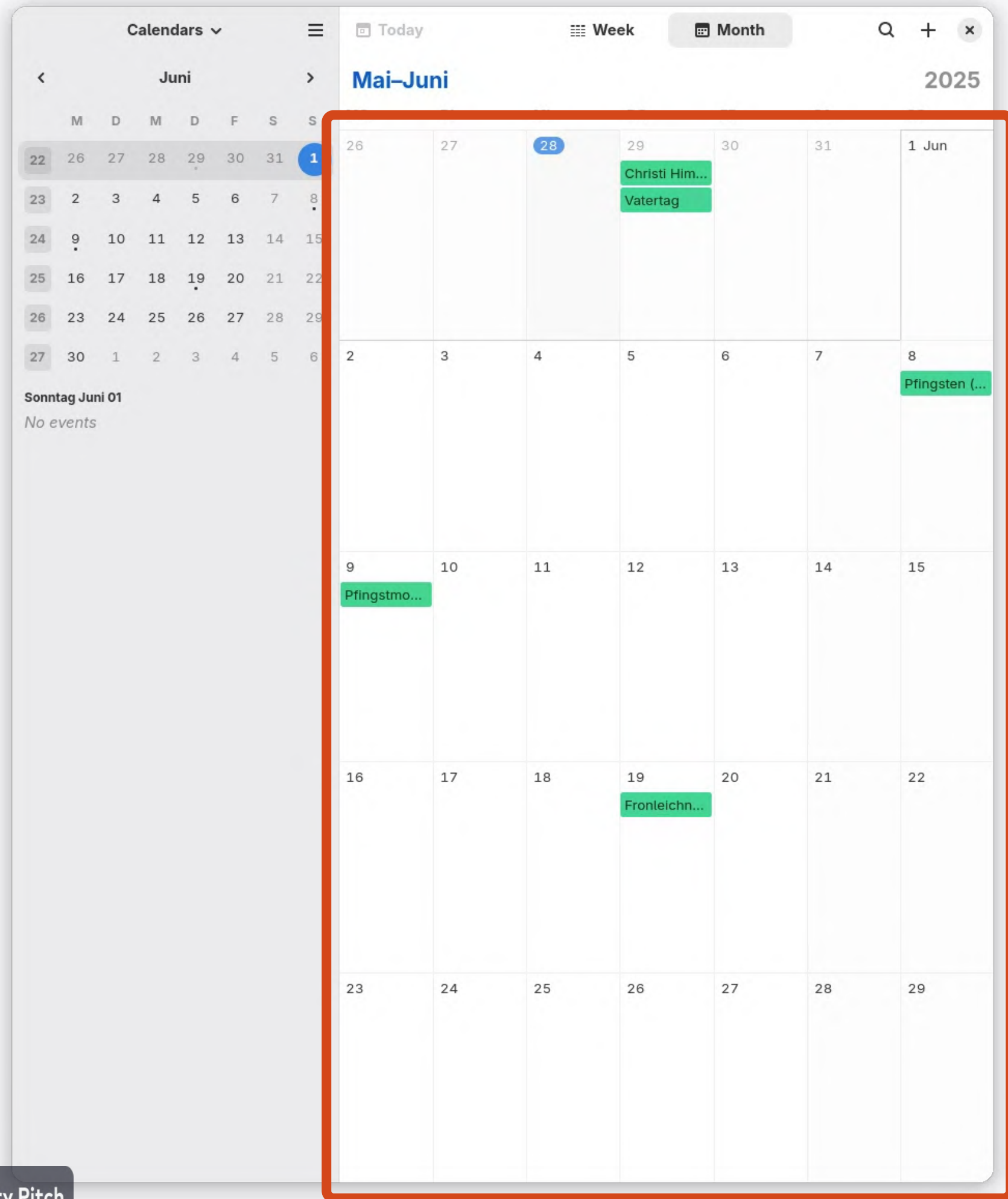
Plain dates

Calendar month and day

```
const mentalHealthDay =
    Temporal.PlainMonthDay
        .from('10-10')
```

Plain dates

Calendar year and month

```
const prideMonth =
    Temporal.PlainYearMonth
        .from('2025-06')
```

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03

Time Zones: the final frontier

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10 June 2025, 19:00, Europe/Berlin

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```
Temporal.ZonedDateTime.from('2025-06-10T19:00[Europe/Berlin]')
```

```
2025-06-10T19:00:00+02:00[Europe/Berlin]
```

```
Temporal.ZonedDateTime.from('2025-06-10T19:00[Europe/Berlin]')
  .toLocaleString('en-UK', {
    dateStyle: 'full',
    timeStyle: 'long',
  })
```

Tuesday, 10 June 2025 at 19:00:00 CEST

```
Temporal.ZonedDateTime.from('2025-06-10T19:00[Europe/Berlin]')
  .withTimeZone('America/Los_Angeles')
  .toLocaleString('en-UK', {
    dateStyle: 'full',
    timeStyle: 'long',
  })
```

Tuesday, 10 June 2025 at 10:00:00 GMT-7

04

Definitive Durations

1h 30min

```
Temporal.Duration.from('PT1H30M')
```

PT1H30M

```
Temporal.Duration.from('PT1H30M')
  .toLocaleString('en-UK', {
    style: 'long',
  })
```

1 hour, 30 minutes

```
const delay = Temporal.Duration.from('PT1H30M')
  .total('milliseconds')
```

```
5400000
```

```
setTimeout(callback, delay)
```

05

Computer, add 2 days

10 June 2025, 19:00, Europe/Berlin

+ 2 days

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```
Temporal.ZonedDateTime.from('2025-06-10T19:00[Europe/Berlin]')
  .add('P2D')
  .toLocaleString('en-UK', {
    dateStyle: 'full',
    timeStyle: 'long',
  })
```

Thursday, 12 June 2025 at 19:00:00 CEST

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26 October 2025, 02:00, Europe/Berlin

+ 2 hours

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```
Temporal.ZonedDateTime.from('2025-10-26T02:00[Europe/Berlin]')
  .add('PT2H')
  .toLocaleString('en-UK', {
    dateStyle: 'full',
    timeStyle: 'long',
  })
```

Sunday, 26 October 2025 at 03:00:00 CET

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How many days until Halloween?

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```
Temporal.Now.plainDateISO()
    .until(Temporal.PlainDate.from('2025-10-31'))
```
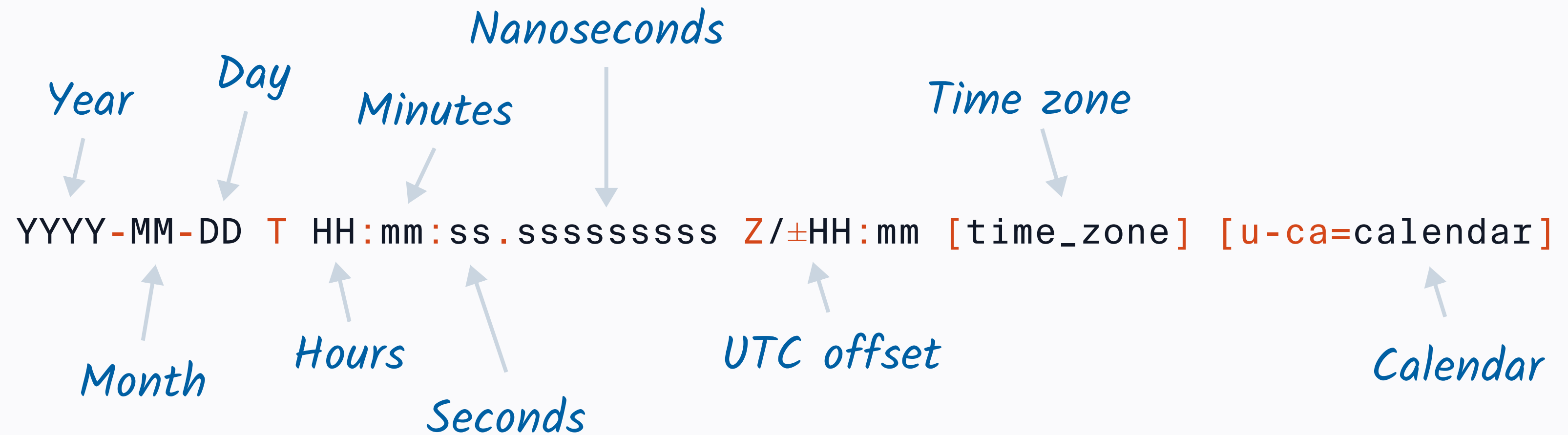
P144D

```
Temporal.Now.plainDateISO()
    .until(Temporal.PlainDate.from('2025-10-31'))
    .toLocaleString('en-UK')
```
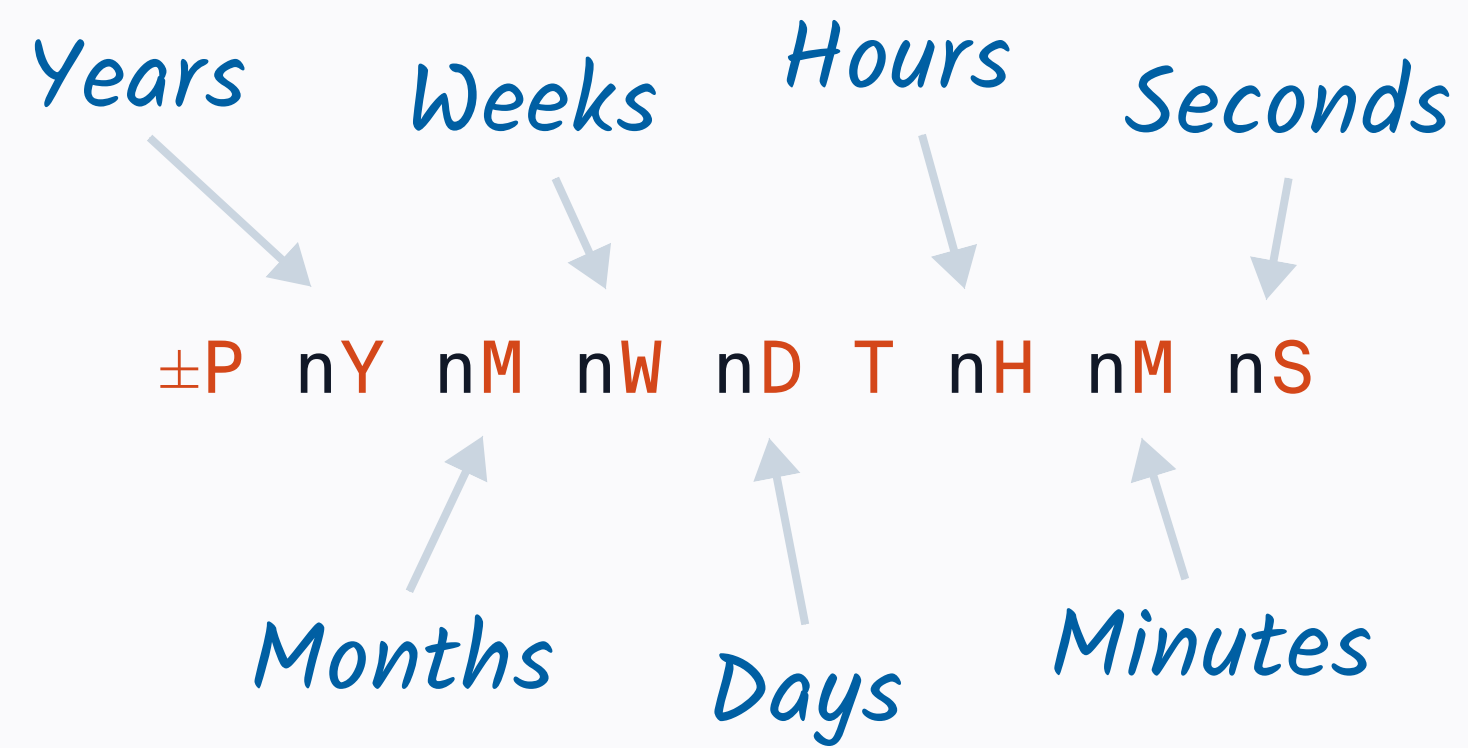
144 days

06

String Theory

Nanoseconds

Year   Minutes   Time zone
       Day

YYYY-MM-DD T HH:mm:ss.sssssssss Z/±HH:mm [time_zone] [u-ca=calendar]

       Month   Hours   UTC offset   Calendar

              Seconds

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±P nY nM nW nD T nH nM nS

Years
Weeks
Hours
Seconds
Months
Days
Minutes

```
Temporal.PlainDate.from({
  year: 2063,
  month: 4,
  day: 5,
})
```

```
Temporal.Duration.from({
  hours: 10,
  minutes: 31,
})
```

There's so much more

01

Conversions

- toPlainDate
- toPlainTime
- toPlainDateTime
- toPlainMonthDay
- toPlainYearMonth
- toZonedDateTime

02

Calculations

- add
- subtract
- abs
- negated
- round
- total

03

Comparisons

- compare
- equals
- since
- until

04

Properties

- hour
- hoursInDay
- day
- dayOfWeek
- dayOfYear
- daysInWeek
- daysInMonth
- month
- monthsInYear
- year
- weekOfYear
- inLeapYear

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	Chrome	Edge	Firefox	Opera	Safari	Chrome Android	Firefox for Android	Opera Android	Safari on iOS	Samsung Internet	WebView Android	WebView on iOS	Deno	Node.js
Temporal API 🧪	No *	No *	139	No *	TP * 🏳	No *	139	No *	No	No	No *	No *	1.40 🏳	No
Duration 🧪	No *	No *	139	No *	TP *	No *	139	No *	No	No	No *	No	1.40 🏳	No
Instant 🧪	No *	No *	139	No *	TP *	No *	139	No *	No	No	No *	No	1.40 🏳	No
Now 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No *
PlainDate 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No
PlainDateTime 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No
PlainMonthDay 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No
PlainTime 🧪	No *	No *	139	No *	TP *	No *	139	No *	No	No	No *	No	1.40 🏳	No
PlainYearMonth 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No
ZonedDateTime 🧪	No *	No *	139	No *	No *	No *	139	No *	No *	No *	No *	No *	1.40 🏳	No

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The sad part

Browser support

🙂 Firefox 139 fully implemented

😐 Safari partially implemented

🥹 Chrome is working on it

Factorial

mdn.io/temporal

tc39.es/proposal-temporal/

PROTECT TRANS KIDS

Design by Miriam Suzanne

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Thank you!

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Slides

fynn.be/talks/tackling-temporal-troubles