The canvas package

Johannes Wolf and fenjalien
https://github.com/johannes-wolf/typst-canvas
https://github.com/fenjalien/typst-canvas

1. Contents

2. Introduction

This package provides a way to draw stuff using a similar API to Processing but with relative coordinates and anchors from Tikz. You also won't have to worry about accidentally drawing over other content as the canvas will automatically resize. And remember up is negative!

3. Usage

This is the minimal starting point:

```
#import "typst-canvas/canvas.typ": canvas

#canvas({
  import "typst-canvas/draw.typ": *
  ...
})
```

Note that draw functions are imported inside the scope of the `canvas` block. This is recommended as draw functions override Typst's functions such as `line`.

3.1. Coordinates

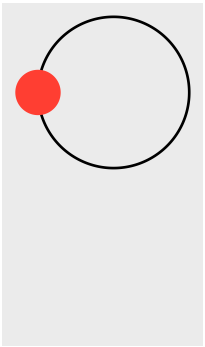
There are four different ways to specify coordinates.

1. Absolute: `(x,y)`
   "`x` units to the right and `y` units down from the origin."
2. Relative: `(rel: (x,y))`
   "`x` units to the right and `y` units down from the previous coordinate."
3. Previous: `()`
   "The previous coordinate."
4. Anchor: `(node: "name", at: "example")` or `"name.example"`
   "The position of anchor `"example"` on node with name `"name"`."
   See Section 3.2

3.2. Anchors

Anchors are named positions relative to named elements.

To use an anchor of an element, you must give the element a name using the `name` parameter.

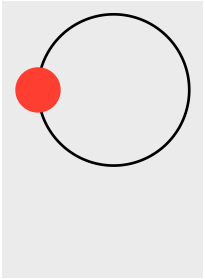


```
#canvas({
  import "typst-canvas/draw.typ": *
  // Name the circle
  circle((0,0), name: "circle")

  // Draw a smaller red circle at "circle"'s left anchor
  fill(red)
  stroke(none)
  circle("circle.left", radius: 0.3)
})
```

All elements will have default anchors based on its bounding box, they are: `center`, `left`, `right`, `above` and `below`. Some elements will have their own anchors.

Elements can be placed relative to its own anchors.



```
#canvas({
  import "typst-canvas/draw.typ": *
  // An element does not have to be named
  // in order to use its own anchors.
  circle((0,0), anchor: "left")

  // Draw a smaller red circle at the origin
  fill(red)
  stroke(none)
  circle((0,0), radius: 0.3)
})
```

4. Reference

`#canvas(background: none, length: 1cm, debug: false, body)`

`background` A `color` to be used for the background of the canvas.

`length` The `length` used to specify what 1 coordinate unit is.

`debug` Shows the bounding boxes of each element when `true`.

`body` A code block in which functions from `draw.typ` have been called.

4.1. Elements

`#line(start, end, mark-begin: none, mark-end: none, name: none)`

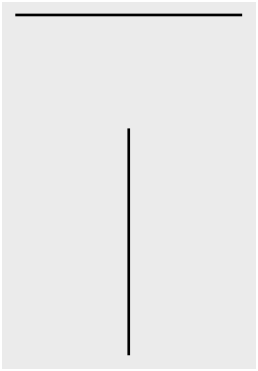
Draws a line (a direct path between two points) to the canvas.

`start` The coordinate to start drawing the line from

`end` The coordinate to draw the line to.

`mark-begin` The type of arrow to draw at the start of the line.

`mark-end` The type of arrow to draw at the end of the line.



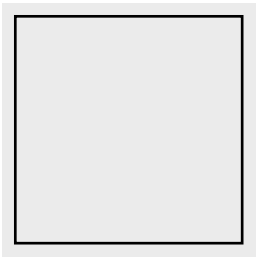
```
#canvas({
  import "typst-canvas/draw.typ": *
  line((-1.5, 0), (rel: (3, 0)))
  line((0, -1.5), (rel: (0, 3)))
})
```

`#rect(a, b, name: none)`

Draws a rectangle to the canvas.

`a` The top left coordinate of the rectangle.

`b` The bottom right coordinate of the rectangle.



```
#canvas({
  import "typst-canvas/draw.typ": *
  rect((-1.5, 1.5), (1.5, -1.5))
})
```

`#arc(position, start, stop, radius: 1, name: none, anchor: none)`

Draws an arc to the canvas.

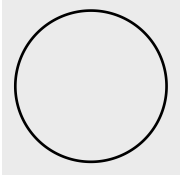
position The coordinate to start drawing the arc from.
start The angle to start the arc.
stop The angle to stop the arc.
radius The radius of the arc's circle.

```
#canvas({
  import "typst-canvas/draw.typ": *
  arc((0,0), 45deg, 135deg)
})
```

`#circle(center, radius: 1, name: none, anchor: none)`

Draws a circle to the canvas.

center The coordinate of the circle's origin.
radius The circle's radius.



```
#canvas({
  import "typst-canvas/draw.typ": *
  circle((0,0))
})
```

`#bezier(start, end, ..ctrl, samples: 100, name: none)`

Draws a bezier curve with 1 or 2 control points to the canvas.

`start` The coordinate to start drawing the line from
`end` The coordinate to draw the line to.
`..ctrl` List of control points
`samples` Number of lines used to constuct the curve

```
#canvas({
  import "typst-canvas/draw.typ": *
  bezier((0, 0), (2, 0), (1, 1))
  bezier((0, -1), (2, -1), (.5, -2), (1.5, 0))
})
```

```
#content(pt, ct, angle: 0deg, name: none, anchor: none)
```

Draws a content block to the canvas.

pt The coordinate of the center of the content block.

ct The content block.

angle The angle to rotate the content block by. Uses Typst's `rotate` function.

Hello World!

```
#canvas({
  import "typst-canvas/draw.typ": *
  content((0,0), [Hello World!])
})
```

4.2. Styles