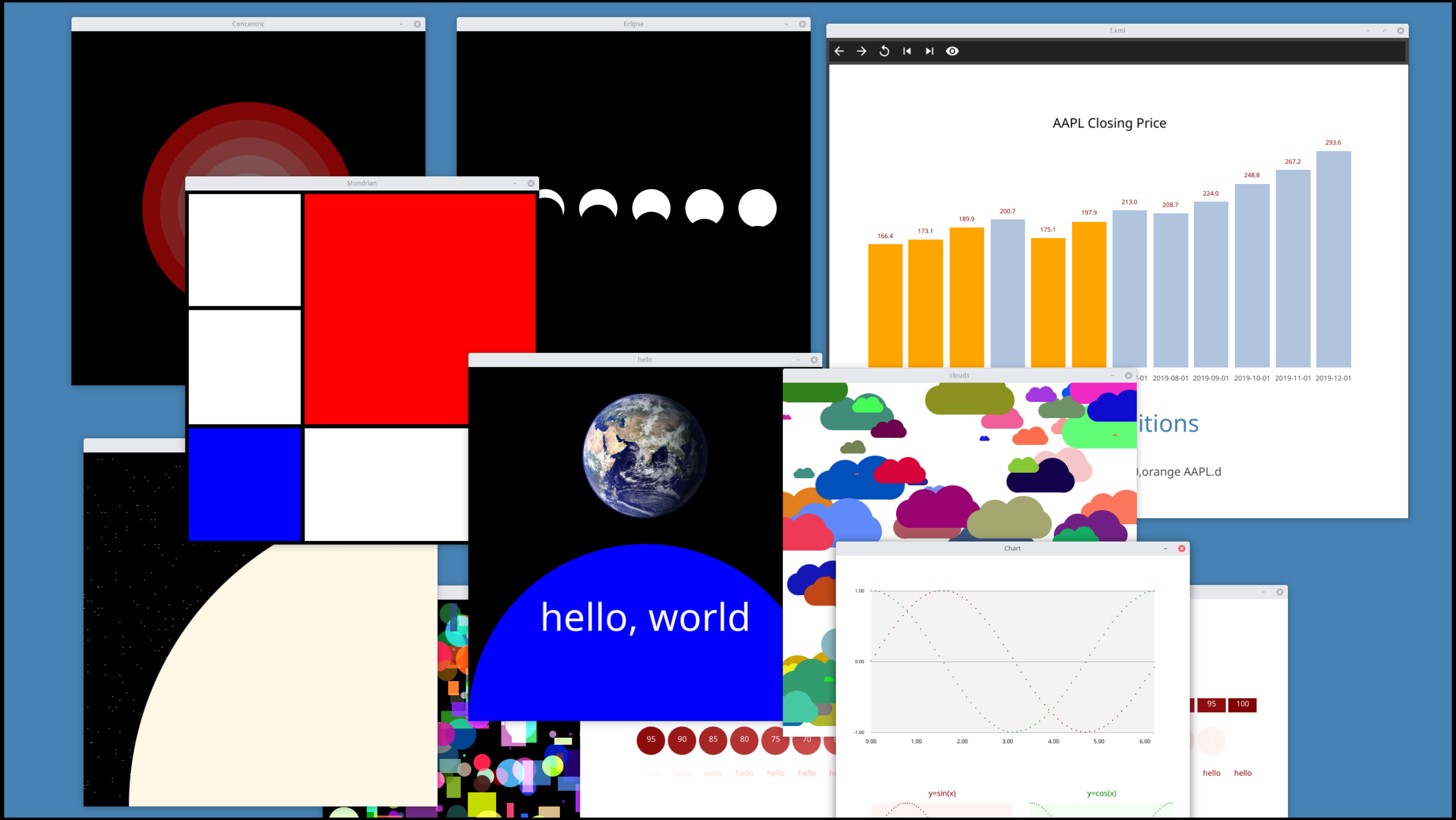
# fc a high-level canvas API for the fyne toolkit



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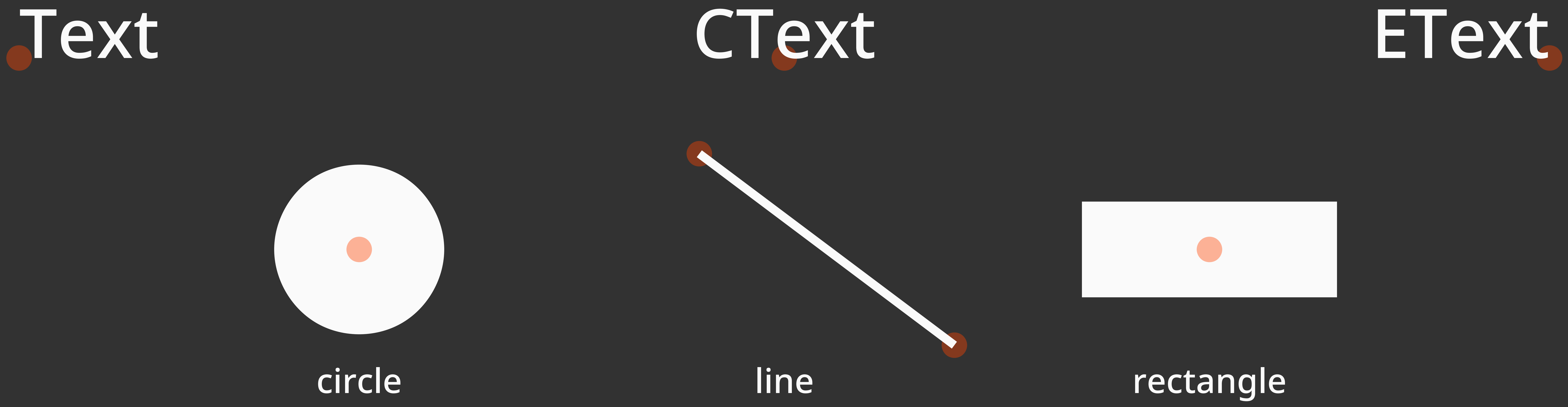
## Motivation

The desire for a high-level Go API for developers and designers to think in terms of high level objects that make up a visual display. The objects will be familiar to anyone using a modern illustration program (text, images, lines, arcs, circles, curves, etc). The API should facilitate the artful arrangement of these elements on a scalable 2D canvas.

Use Cases: Information Displays, Data Visualization, Creative Coding, Presentations

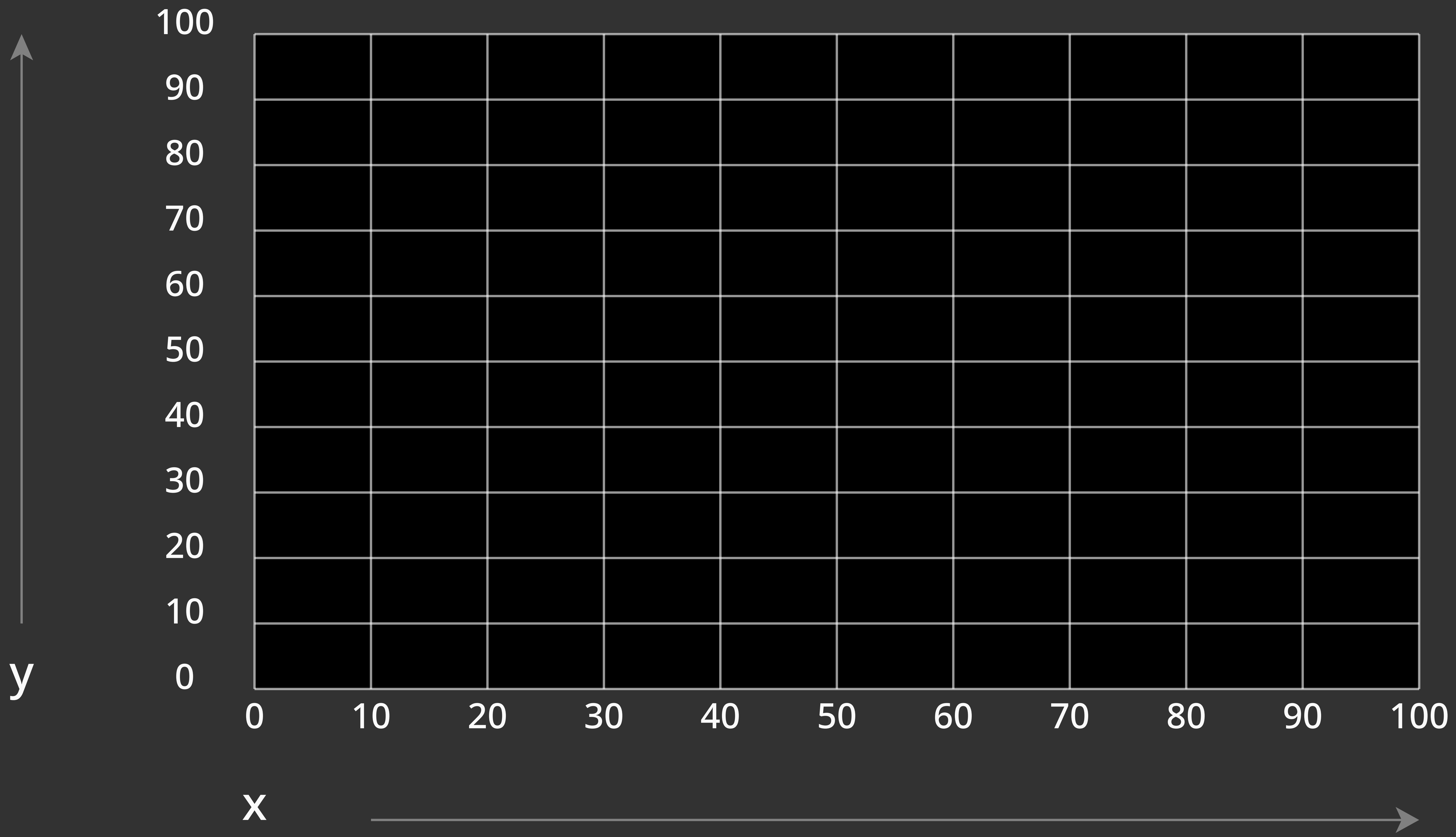
https://gist.github.com/ajstarks/5bad9b1f5a859b86a17a03bbfbafcee6

## Elements

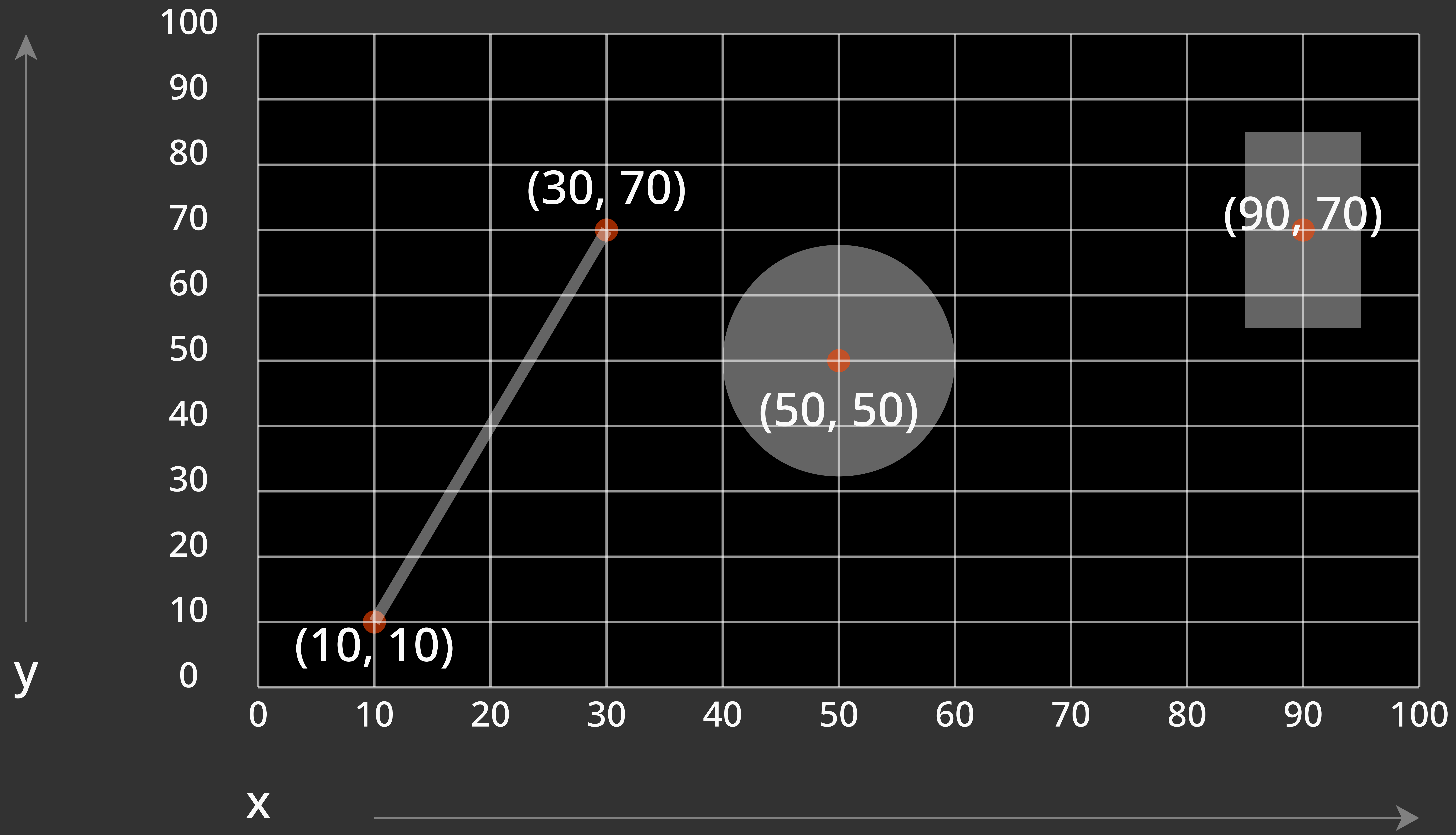


image

# The Percent Grid



# Using the Percent Grid



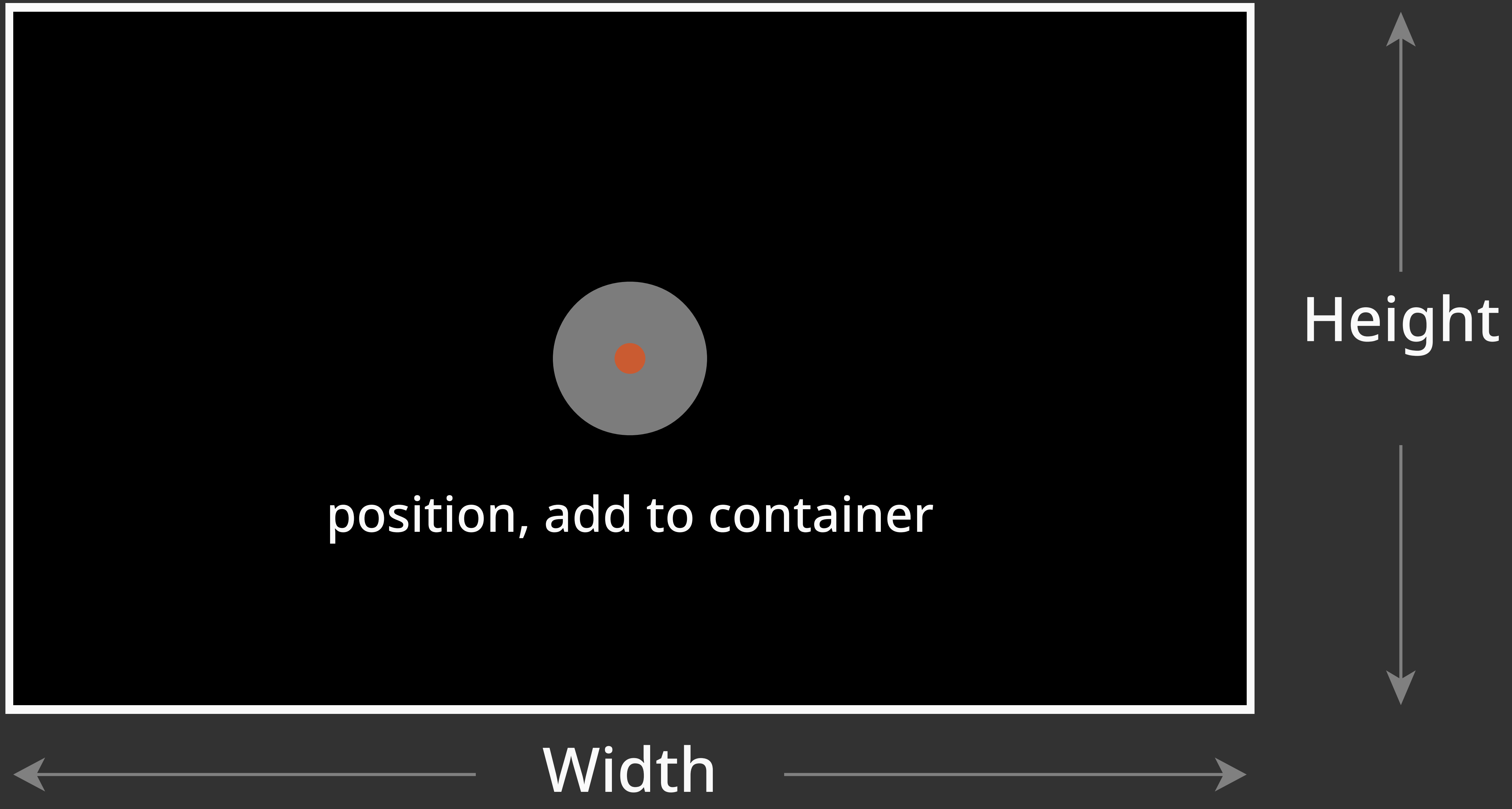
Rect(90, 70, ...)

Circle(50, 50, ...)

Line(10, 10, 30, 70, ...)

## fc structure and operation

```
// Canvas is where objects are drawn into
type Canvas struct {
    Window    fyne.Window
    Container *fyne.Container
    Width     float64
    Height    float64
}
```



# fc Percentage-based methods on *Canvas

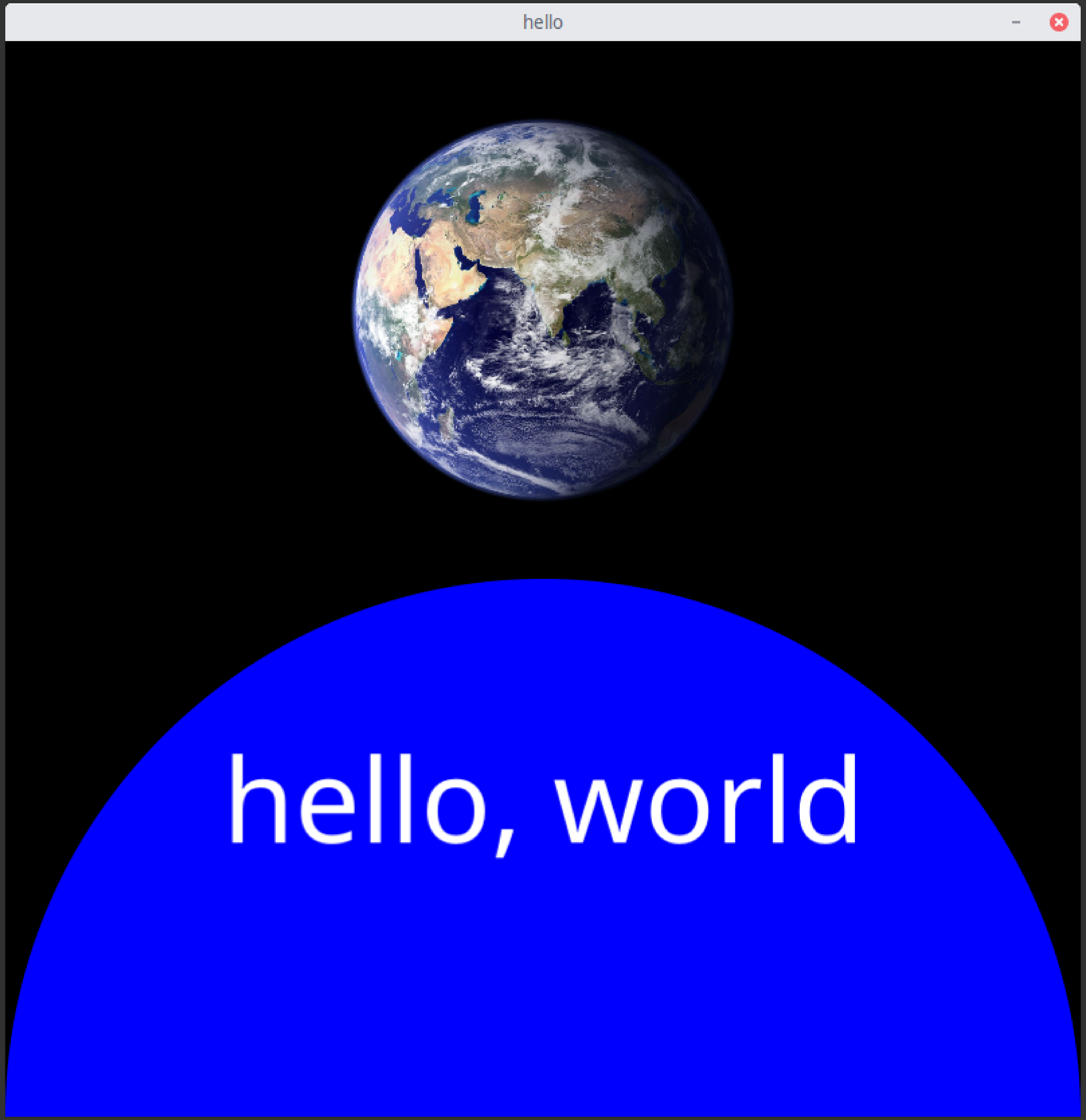
| | |
|---|---|
| Make a new canvas | `NewCanvas(name string, w, h int) Canvas` |
| Place text, left-aligned | `Text(x, y, size float64, s string, fill color.RGBA)` |
| Place centered text | `CText(x, y, size float64, s string, fill color.RGBA)` |
| Place end-aligned text | `EText(x, y, size float64, s string, fill color.RGBA)` |
| Obtain the text width | `TextWidth(s string, size float64) float64` |
| Circle centered (x,y), radius r | `Circle(x, y, r float64, fill color.RGBA)` |
| Rectangle, upper-left at (x,y) | `CornerRect(x, y, w, h float64, fill color.RGBA)` |
| Rectangle centered at (x,y) | `Rect(x, y, w, h float64, fill color.RGBA)` |
| Line from (x1,y) to (x2,y2) | `Line(x1, y1, x2, y2, size float64, stroke color.RGBA)` |
| Image centered at (x,y) | `Image(x, y float64, w, h int, name string)` |
| Display and run | `EndRun()` |

# Convenience methods

| | |
|---|---|
| Lookup colors by name | `ColorLookup(s string) color.RGBA` |
| Map one range into another | `MapRange(value, low1, high1, low2, high2 float64) float64` |
| Polar to Cartesian | `Polar(x, y, r, angle float64) (float64, float64)` |
| Convert degrees to radians | `Radians(deg float64) float64` |

## fc hello, world

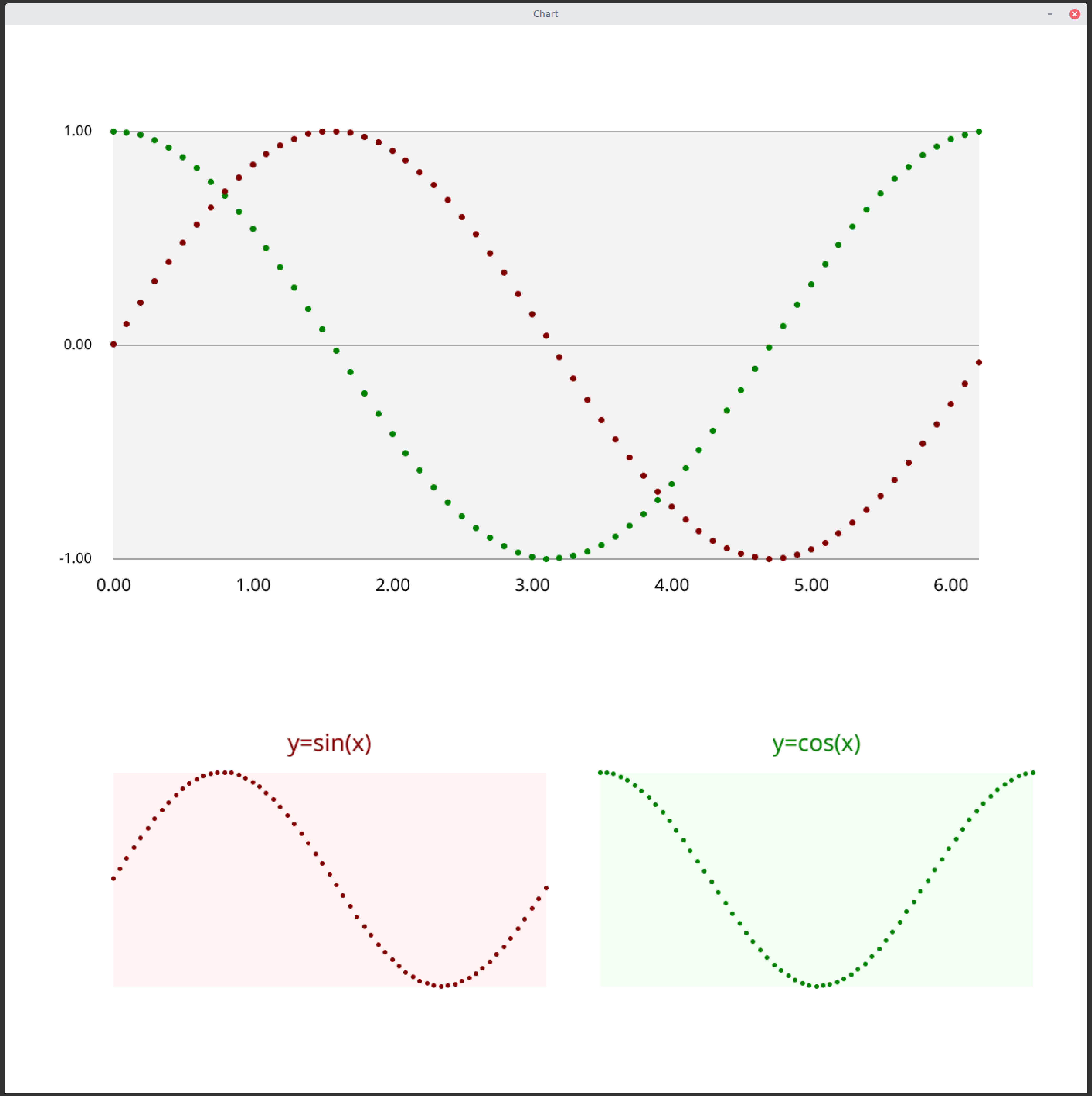
```
package main

import (
	"image/color"

	"github.com/ajstarks/fc"
)

func main() {
	width, height := 500, 500
	blue := color.RGBA{0, 0, 255, 255}
	white := color.RGBA{255, 255, 255, 255}

	canvas := fc.NewCanvas("hello", width, height)

	canvas.Circle(50, 0, 100, blue)
	canvas.CText(50, 25, 10, "hello, world", white)
	canvas.Image(50, 75, 200, 200, "earth.jpg")

	canvas.EndRun()
}
```



# fc/chart

## Scalable, modular, composable charts

- Bar charts
- Column Charts
- Line charts
- Scatter charts
- Title
- Axes
- Frames



## fc/chart: data structures

```
// NameValue is a name,value pair
type NameValue struct {
    label string
    note  string
    value float64
}

// ChartBox holds the essential data for making a chart
type ChartBox struct {
    Title                    string
    Data                     []NameValue
    Color                    color.RGBA
    Top, Bottom, Left, Right float64
    Minvalue, Maxvalue       float64
    Zerobased                bool
}
```

# fc/chart methods on *ChartBox

| | |
|---|---|
| Read data int ChartBox | `func DataRead(r io.Reader) (ChartBox, error)` |
| Bar Chart | `Bar(c fc.Canvas, size float64)` |
| Horizontal Bar Chart | `HBar(c fc.Canvas, size, linespacing, textsize float64)` |
| Line Chart | `Line(c fc.Canvas, size float64)` |
| Scatter Chart | `Scatter(c fc.Canvas, size float64)` |
| Centered Title | `CTitle(c fc.Canvas, size, offset float64)` |
| Chart Frame | `Frame(c fc.Canvas, opacity float64)` |
| X Axis Label | `Label(c fc.Canvas, size float64, interval int)` |
| Y axis | `YAxis(c fc.Canvas, size, min, max, step float64, fmt string, grid bool)` |

## fc/chart: read data

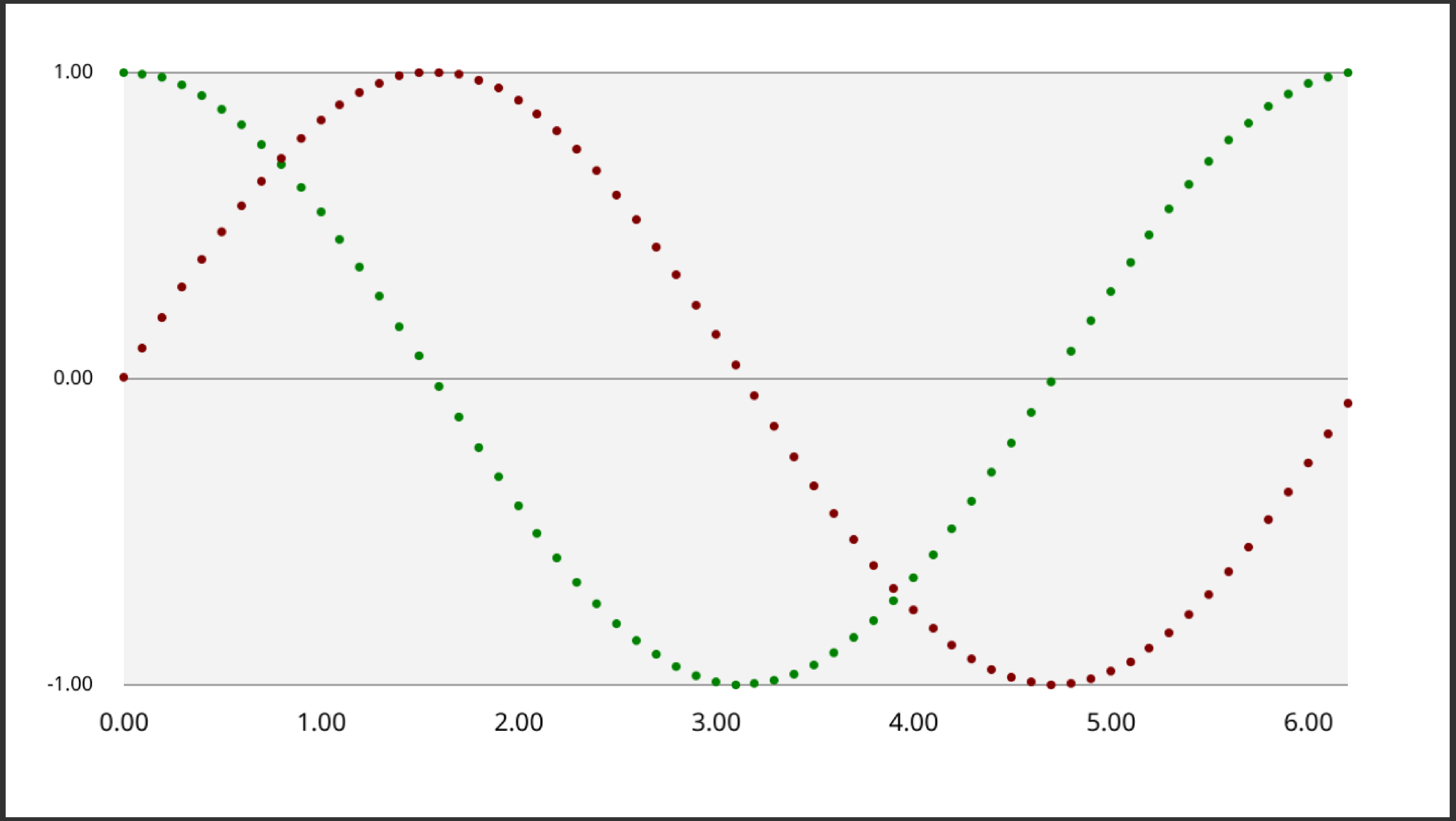
```go
sr, err := os.Open("sin.d")
if err != nil {
    return err
}
cr, err := os.Open("cos.d")
if err != nil {
    return err
}
sine, err := chart.DataRead(sr)
if err != nil {
    return err
}
cosine, err := chart.DataRead(cr)
if err != nil {
    return err
}
```

```
# y=sin(x)
0.00    0.0000
0.10    0.0998
0.20    0.1987
0.30    0.2955
0.40    0.3894
0.50    0.4794
0.60    0.5646
0.70    0.6442
0.80    0.7174
0.90    0.7833
1.00    0.8415
...
6.00    -0.2794
6.10    -0.1822
6.20    -0.0831
```

```
# y=cos(x)
0.00    1.0000
0.10    0.9950
0.20    0.9801
0.30    0.9553
0.40    0.9211
0.50    0.8776
0.60    0.8253
0.70    0.7648
0.80    0.6967
0.90    0.6216
1.00    0.5403
...
6.00    0.9602
6.10    0.9833
6.20    0.9965
```

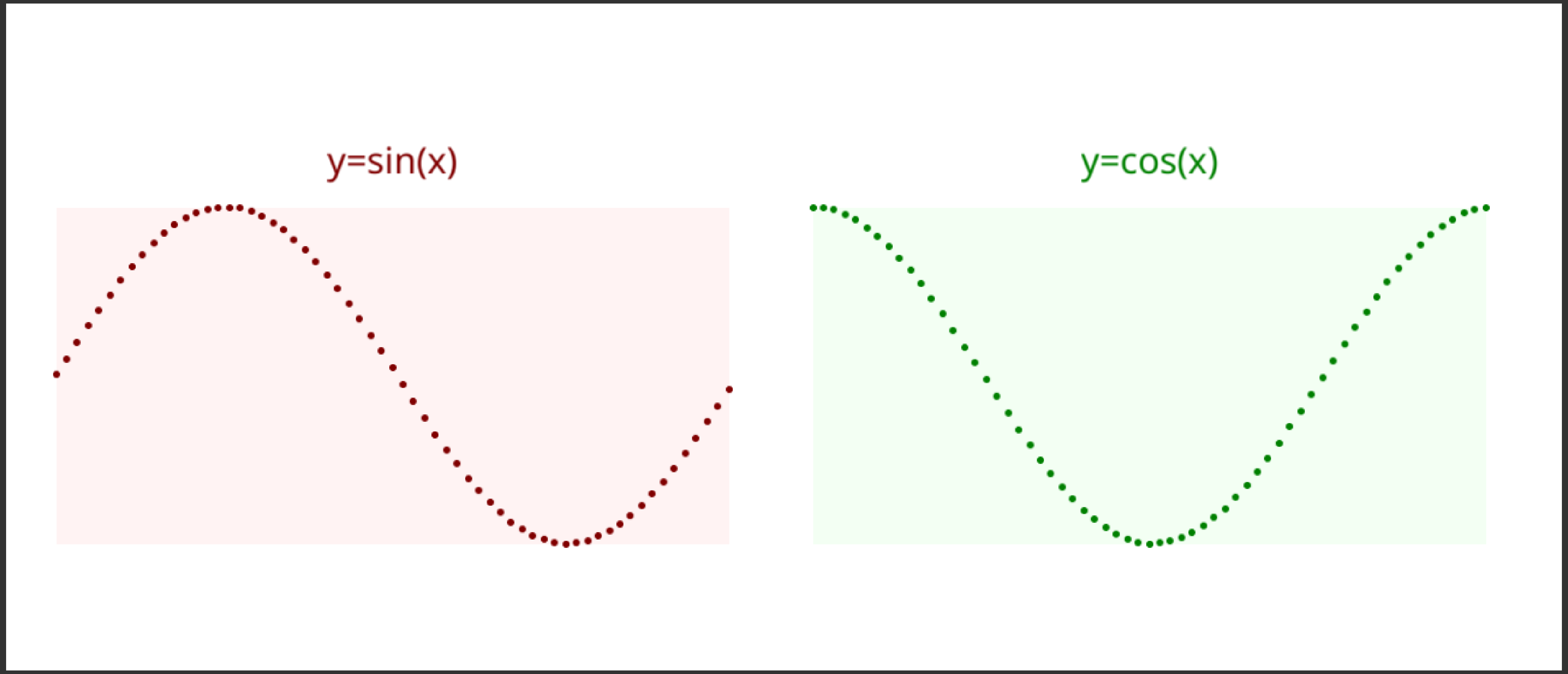
# fc/chart: two data sets

```
cosine.Frame(canvas, 5)
cosine.Label(canvas, 1.5, 10)
cosine.YAxis(canvas, 1.2, -1.0, 1.0, 1.0, "%0.2f", true)
cosine.Color = color.RGBA{0, 128, 0, 255}
sine.Color = color.RGBA{128, 0, 0, 255}
cosine.Scatter(canvas, 0.75)
sine.Scatter(canvas, 0.75)
```

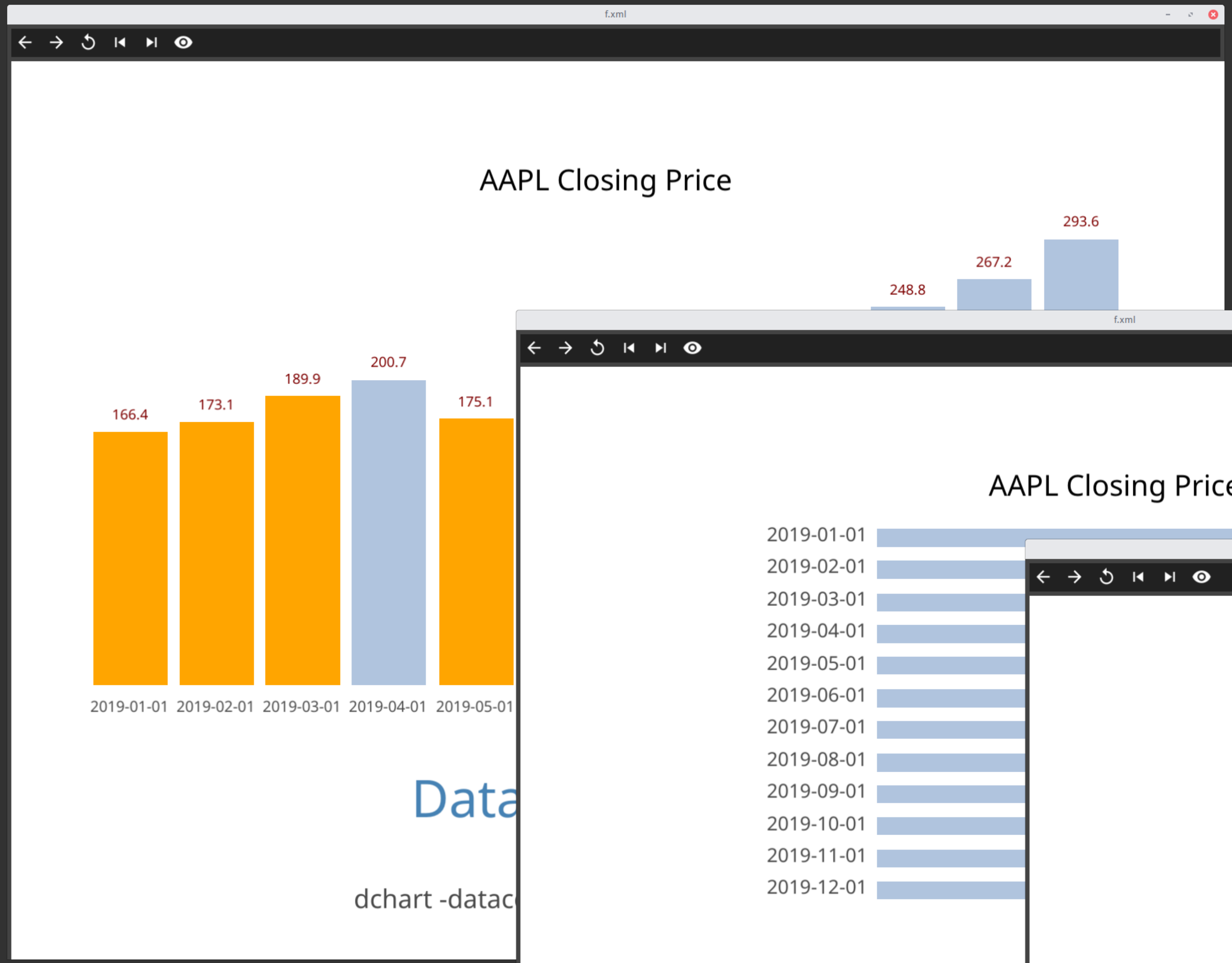


# fc/chart: side by side

```
sine.Left = 10
sine.Right = sine.Left + 40
sine.Top, cosine.Top = 30, 30
sine.Bottom, cosine.Bottom = 10, 10

sine.CTitle(canvas, 2, 2)
sine.Frame(canvas, 5)
sine.Scatter(canvas, 0.5)

offset := 45.0
cosine.Left = sine.Left + offset
cosine.Right = sine.Right + offset

cosine.CTitle(canvas, 2, 2)
cosine.Frame(canvas, 5)
cosine.Scatter(canvas, 0.5)
```

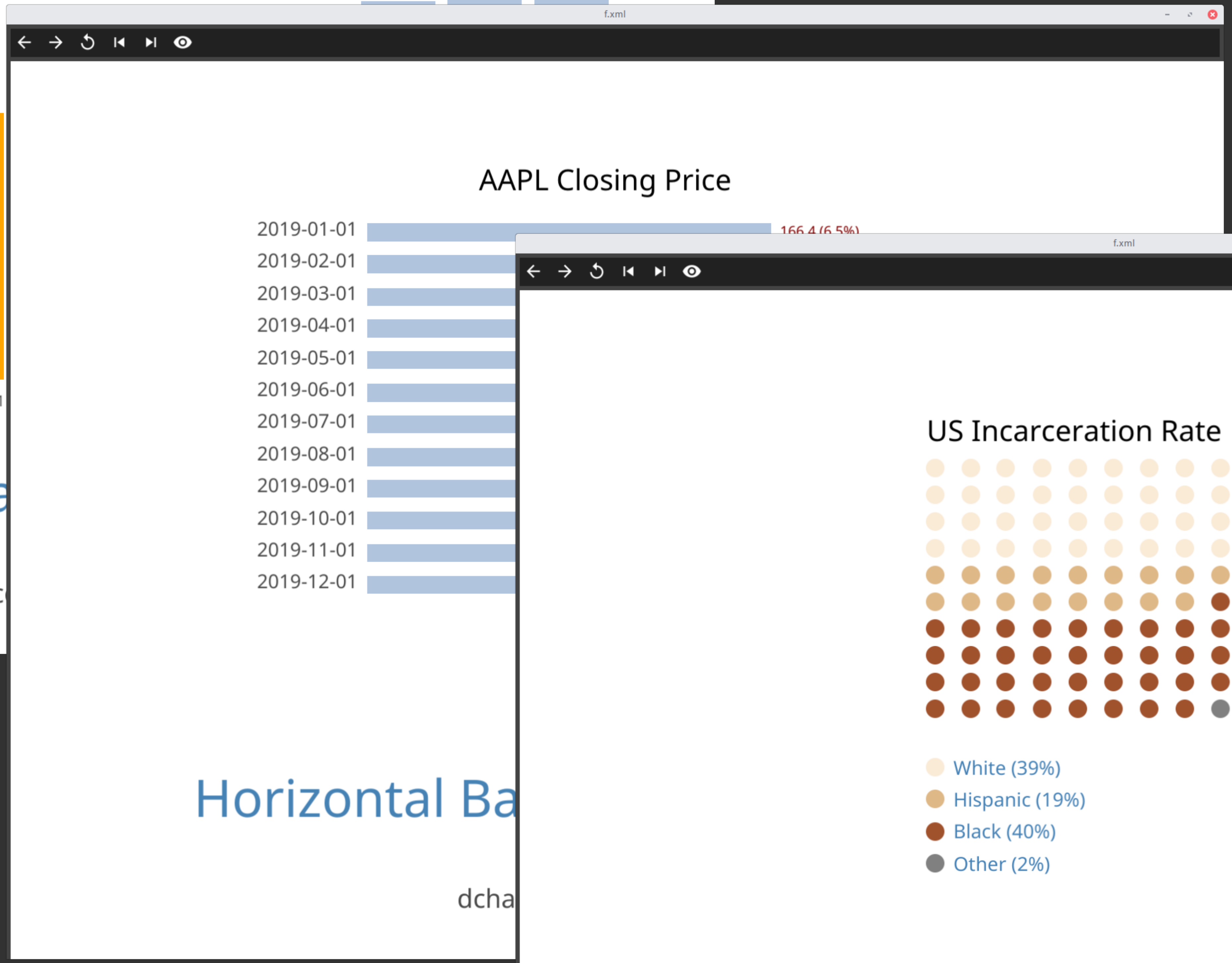


# fcdeck: decksh viewer



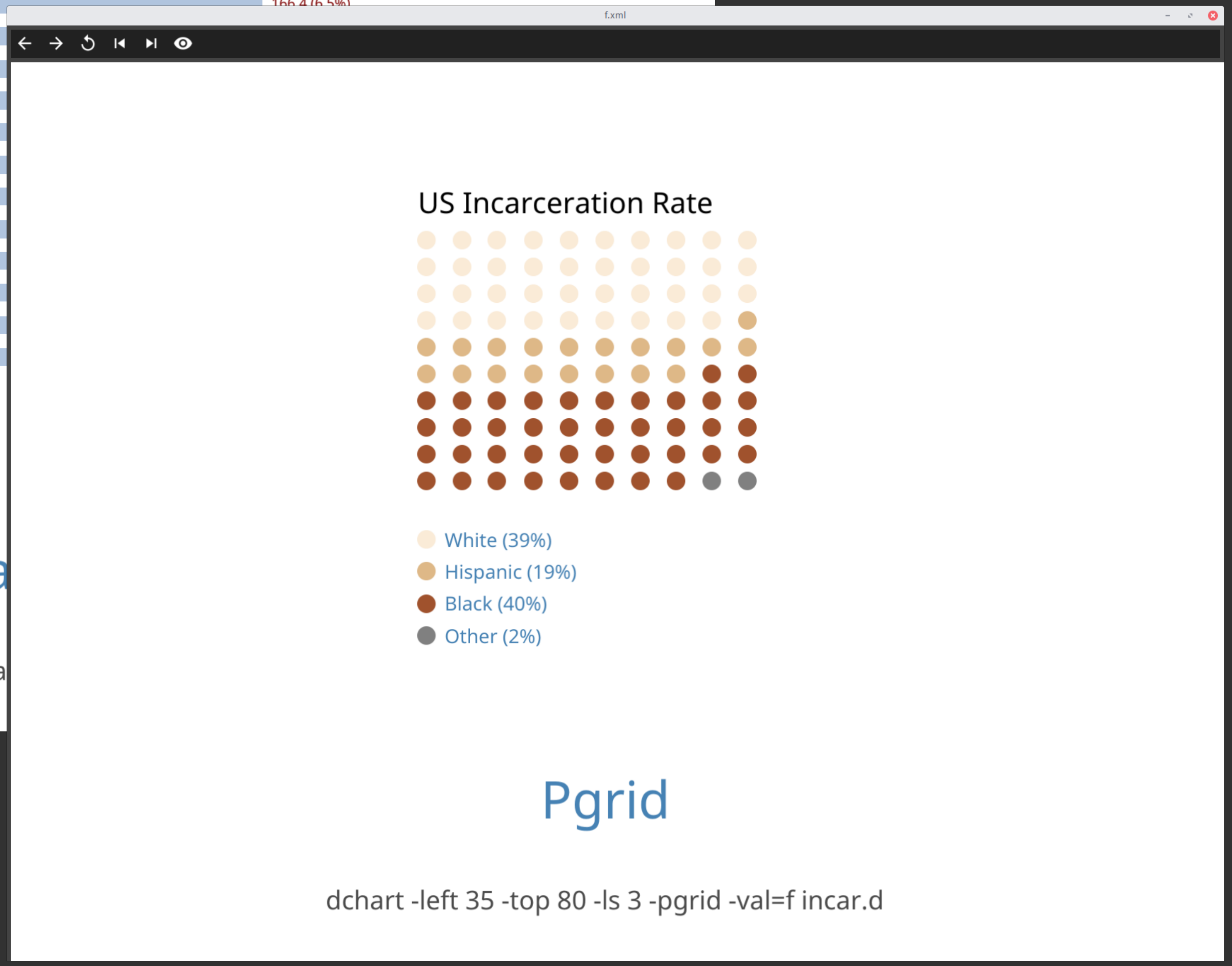
Data

dchart -datac



Horizontal Ba

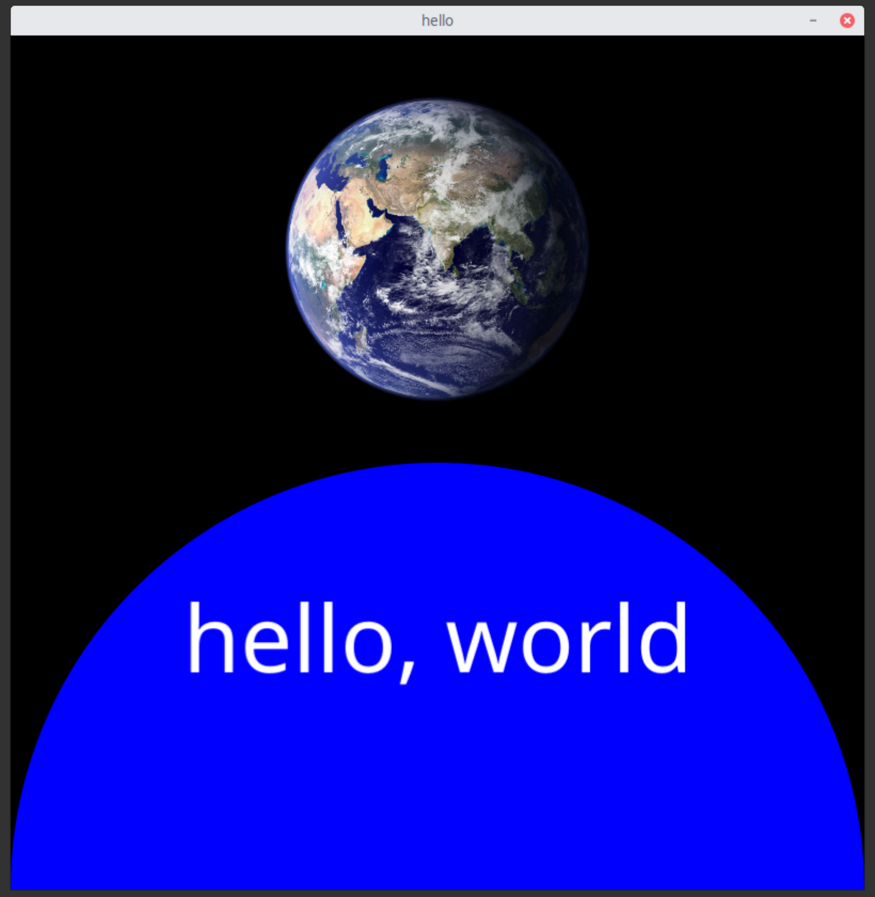
dcha



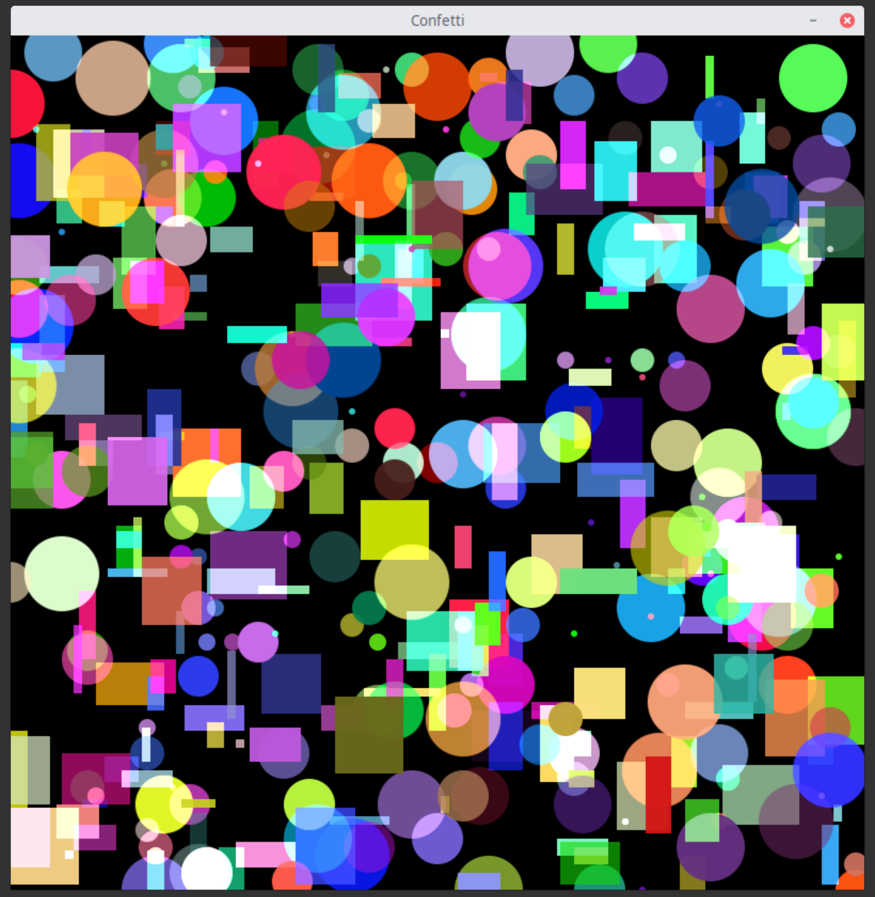
Pgrid

dchart -left 35 -top 80 -ls 3 -pgrid -val=f incar.d

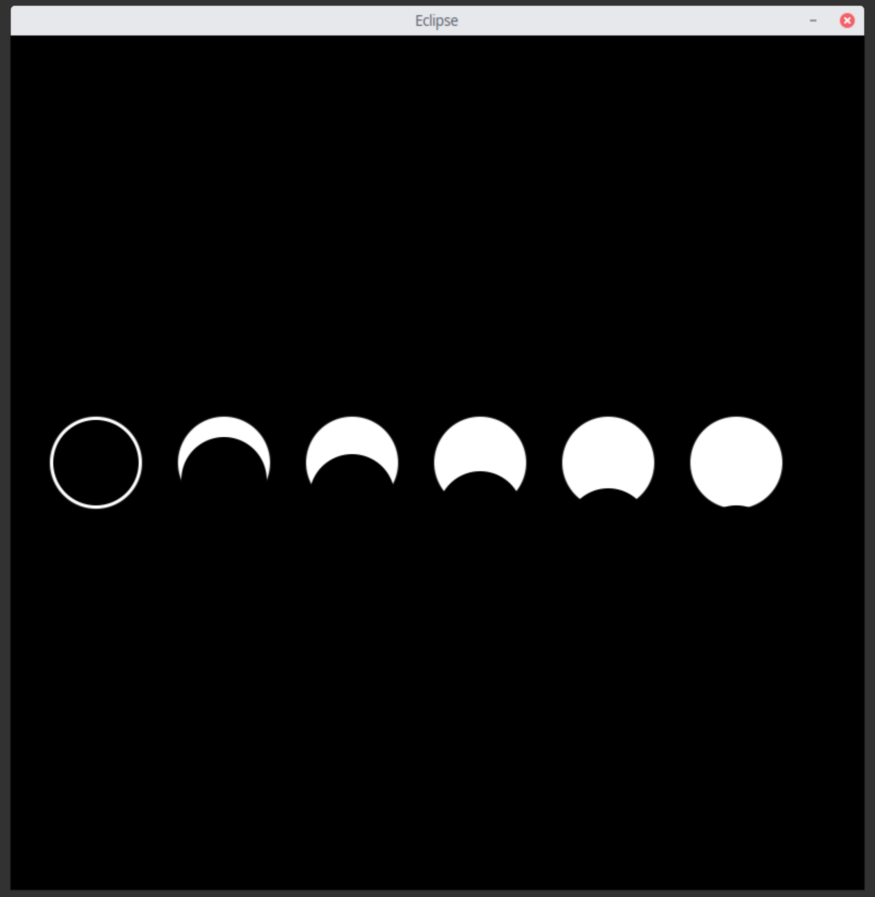
# demo/test clients



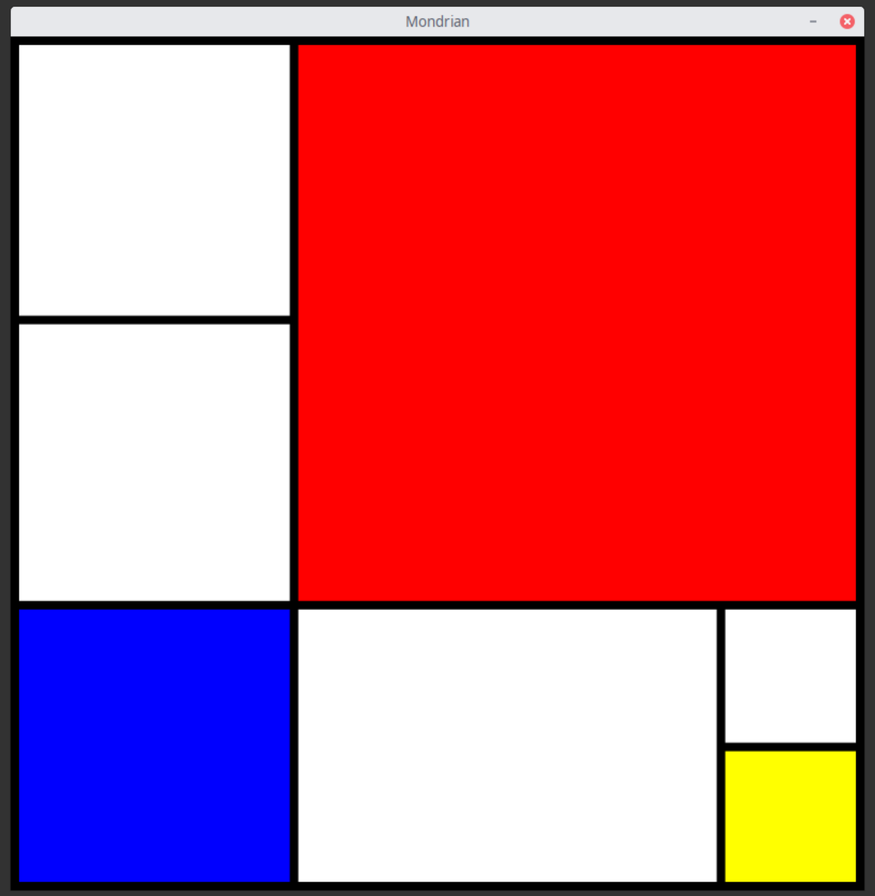
hello



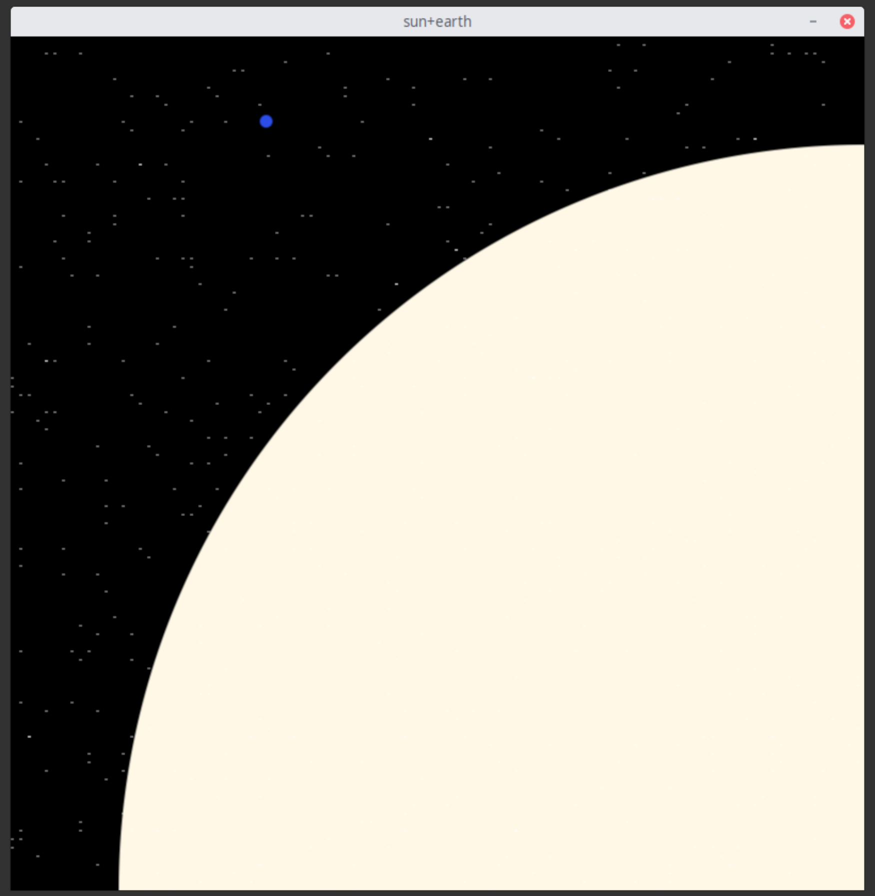
confetti



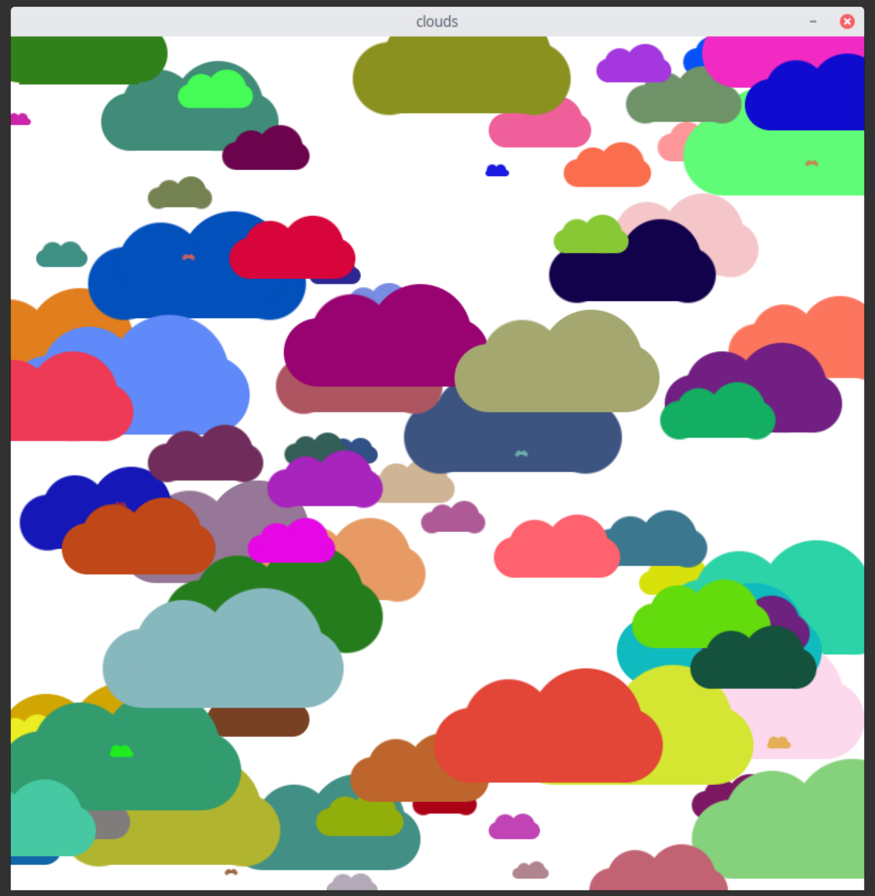
eclipse



mondrian



sunearth



cloud

## go get it

```
github.com/ajstarks/fc
```