

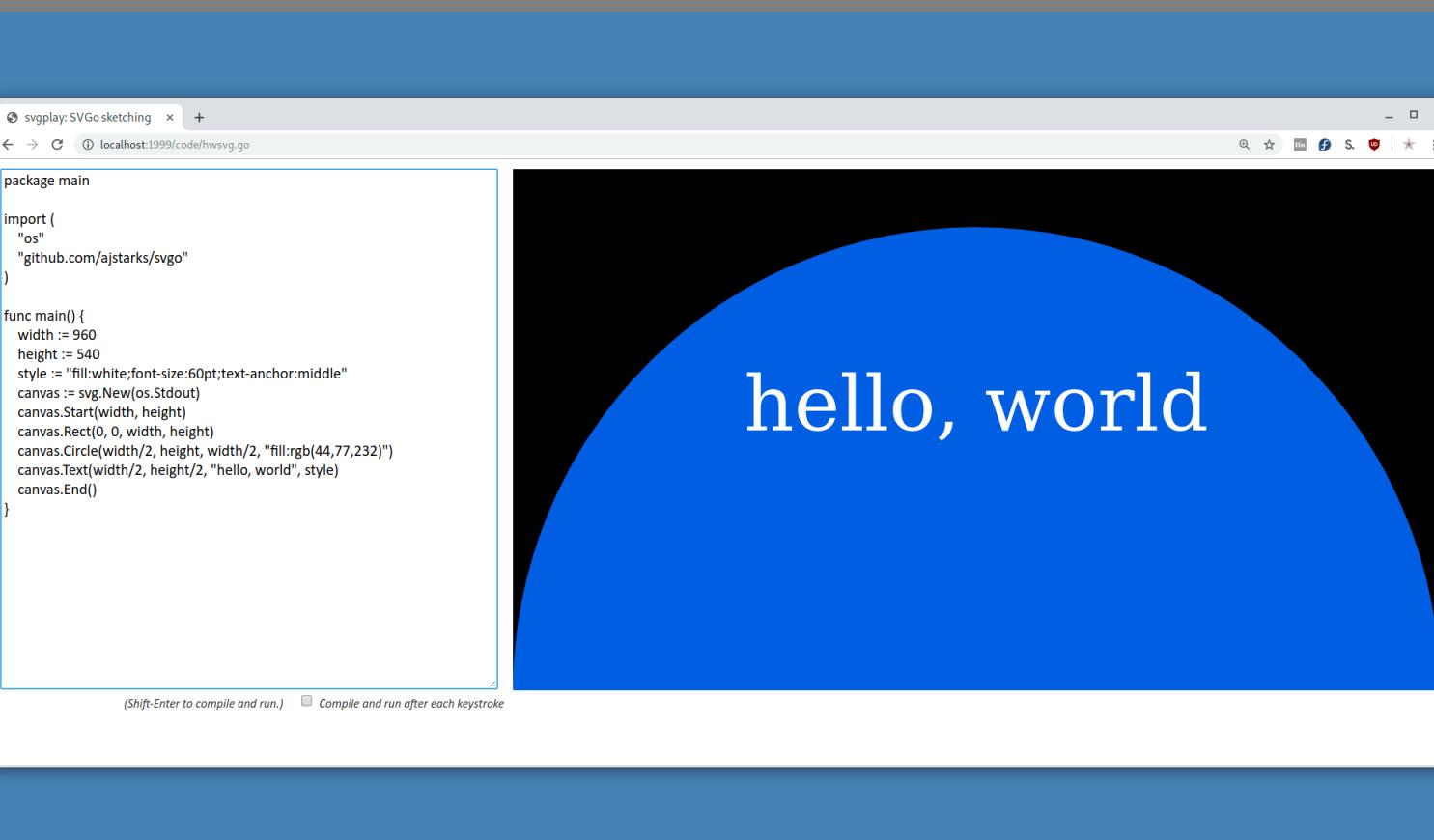
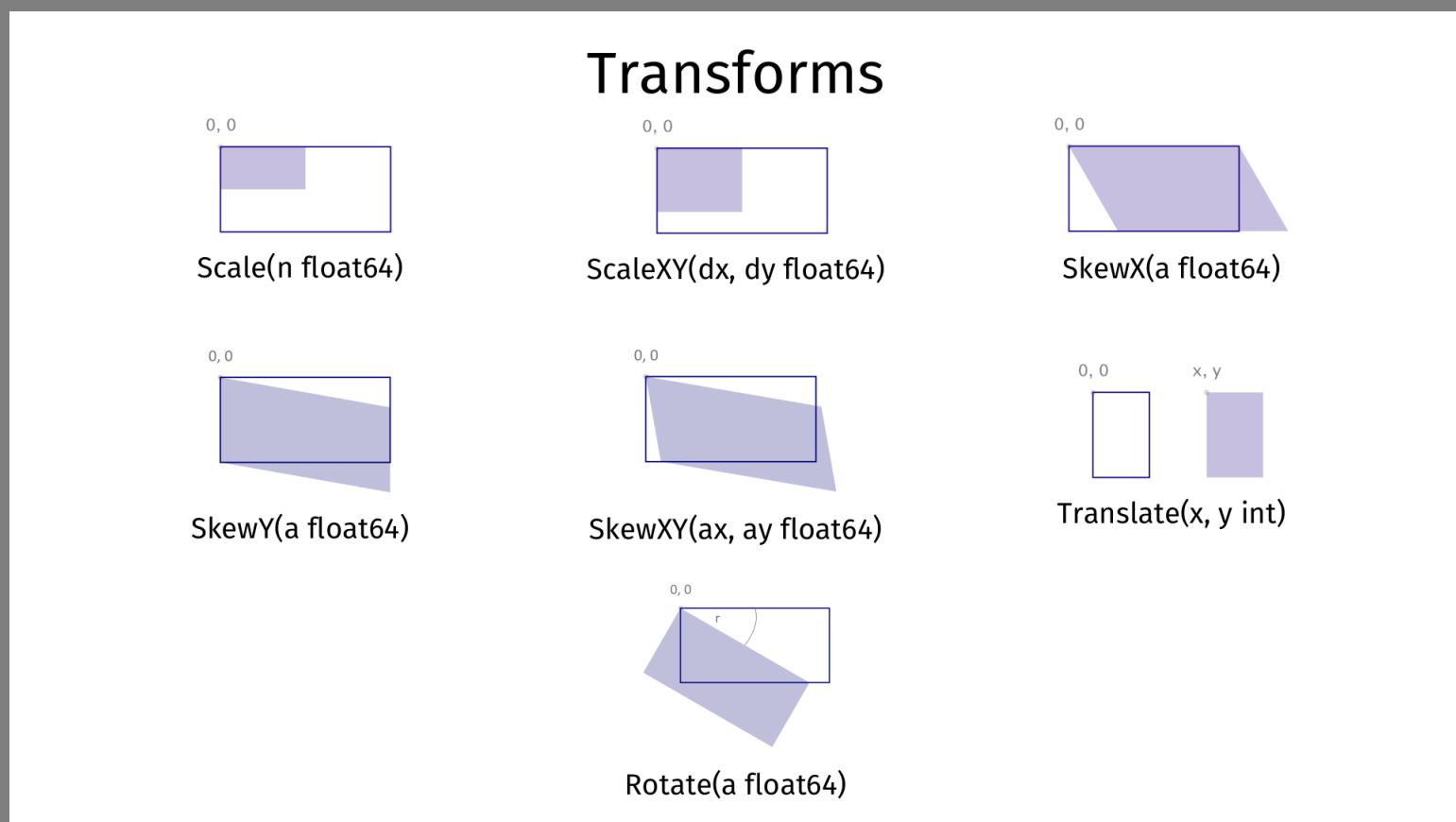


SVG

Workshop

Anthony Starks
@ajstarks

You will learn:



SVGo API

Sketching with code

SVGo with other APIs

You will need:

```
$ cd
$ go version
go version go1.12.9 linux/amd64
$ go get github.com/ajstarks/svg/
$ git clone https://github.com/ajstarks/svg-workshop
Cloning into 'svg-workshop'...
remote: Enumerating objects: 17, done.
remote: Counting objects: 100% (17/17), done.
remote: Compressing objects: 100% (14/14), done.
remote: Total 531 (delta 5), reused 14 (delta 3), pack-reused 514
Receiving objects: 100% (531/531), 75.70 MiB | 33.60 MiB/s, done.
Resolving deltas: 100% (111/111), done.
$ cd svg-workshop/code/svgplay-samples/
/home/ajstarks/svg-workshop/code/svgplay-samples
$ svgplay
2019/08/18 21:52:37 💀💀💀 Warning: this server allows a client connecting to 127.0.0.1:1999 to execute code on this computer 💀💀💀
```

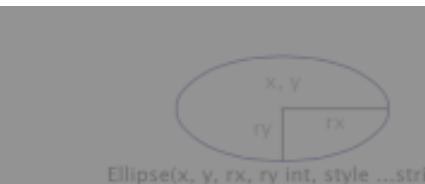
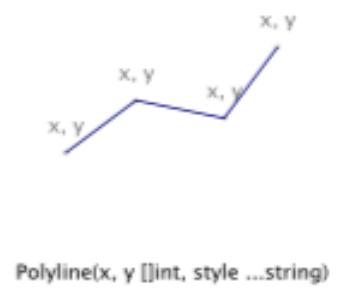
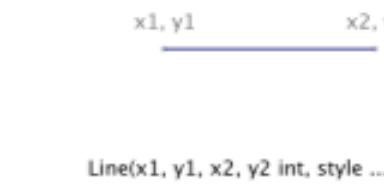
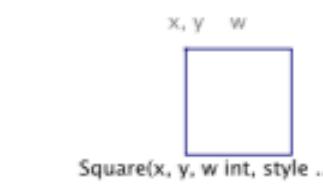
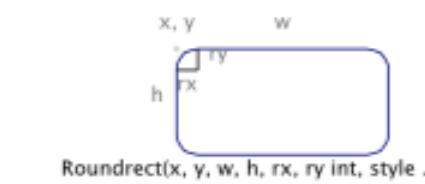
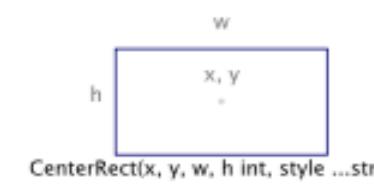
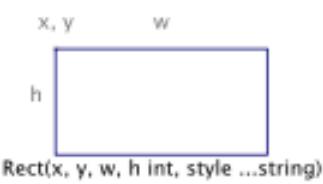
Go installation and command line



Modern Browser

SVG Go Library

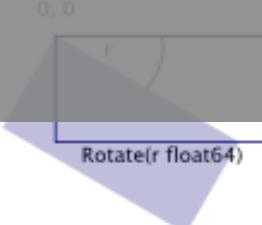
github.com/ajstarks/svggo



```
$ go get github.com/ajstarks/svggo/...
```

```
$ git clone https://github.com/ajstarks/svgo-workshop
```

```
$ cd svgo-workshop/code/svgplay-samples
```

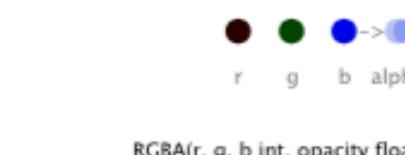
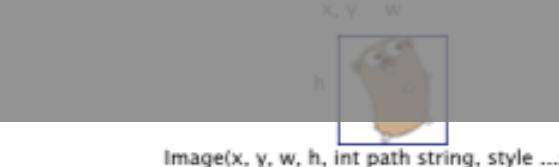


hello, this is SVG

It's "time" & "dandy" to draw text along

Textpath(s, pathid string, style ...string)

W3C



New(w io Writer)
Start(w, h int, options ...string)/End()
Startview(w, h, minx, miny, vx, vh int)
Groups ...string)/Gend()
Gstyle(s string)/Gend()
Gtransf(s string)/Gend()
Gid(id string)/Gend()
ClipPath(s ...string)/ClipEnd()
Defn()/DefEnd()
Marker() /MarkerEnd()
Pattern() /PatternEnd()
Desc(s string)
Title(s string)
Script(type, data ...string)
Mask(id string, x,y,w,h int, style ...string)/MaskEnd()
Link(href string, title string)/LinkEnd()
Use(x int, y int, link string, style ...string)

specify destination
begin/end the document
begin/end the document with viewport
begin/end group with attributes
begin/end group style
begin/end group transform
begin/end group id
begin/end clip path
begin/end a definition block
begin/end markers
begin/end patterns
set the description element
set the title element
define a script
begin/end mask element
begin/end link to href, with a title
use defined objects

Textlines(x, y int, s []string, size, spacing int, fill, align string)



Scalable Vector Graphics



io.Writer

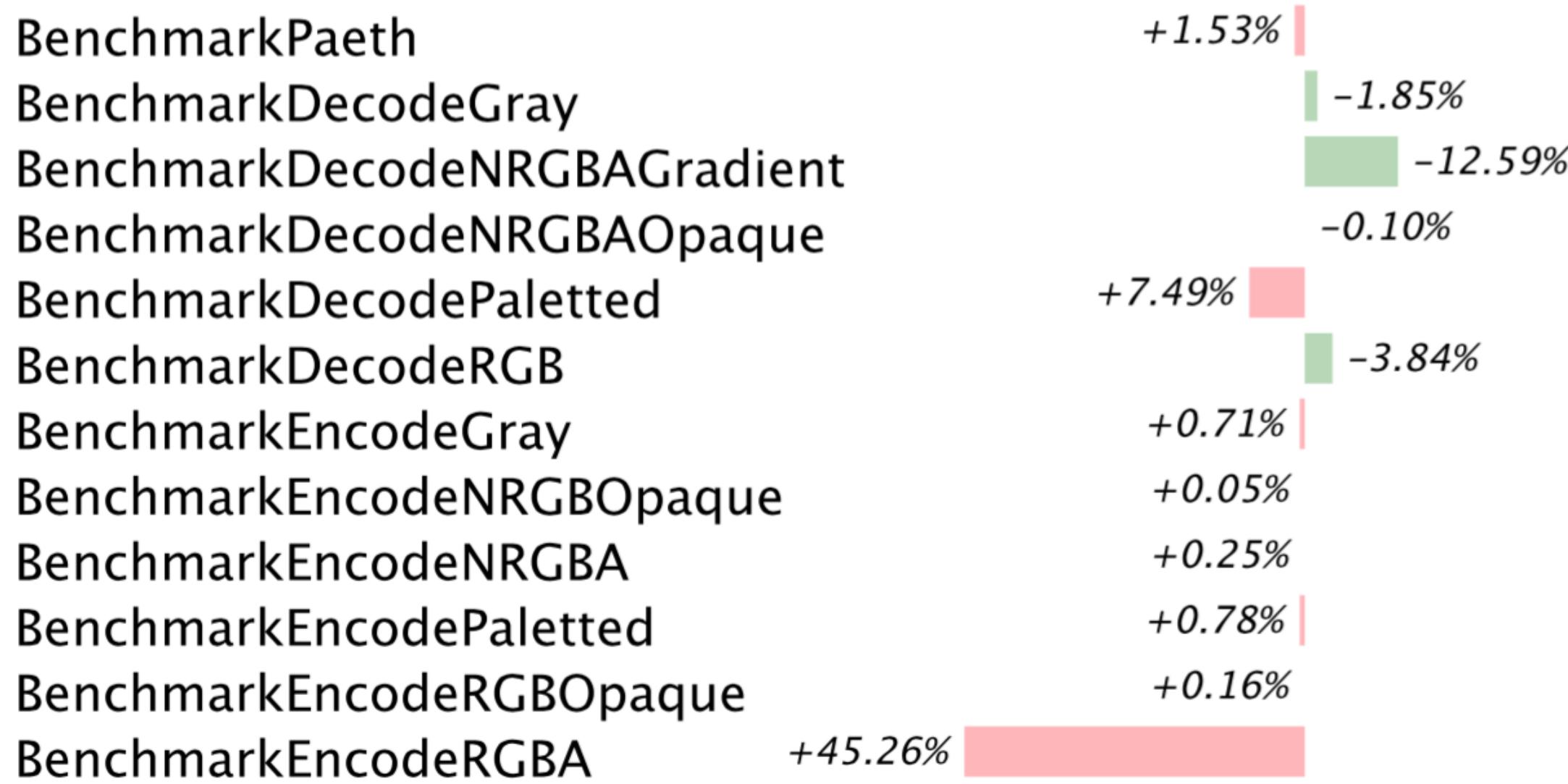
SVGo Clients in the Repo

svgdef	Creates a SVG representation of the API	pattern	Test patterns
android	The Android logo	planets	Show the scale of the Solar system
bubtrail	Bubble trails	pmap	Proportion maps
bulletgraph	Bullet Graphs (via Stephen Few)	randcomp	Compare random number generators
colortab	Display SVG named colors with RGB values	richter	Gerhard Richter's 256 colors
compx	Component diagrams	rl	Random lines
flower	Random flowers	skewabc	Skew ABC
fontcompare	Compare two fonts	stockproduct	Visualize product and stock prices
f50	Get 50 photos from Flickr from a query	svgopher	SVGo Mascot
fe	Filter effects	svgplay	SVGo sketching server
funnel	Funnel from transparent circles	svgplot	Plot data
gradient	Linear and radial gradients	svgrid	Compose SVG files in a grid
html5logo	HTML5 logo with draggable elements	tsg	Twitter Search Grid
imfade	Show image fading	tumblrgrid	Tumblr picture grid
lewitt	Version of Sol Lewitt's Wall Drawing 91	turbulence	Turbulence filter effect
ltr	Layer Tennis Remixes	vismem	Visualize data from files
marker	Test markers	webfonts	"Hello, World" with Google Web Fonts
paths	Demonstrate SVG paths	websvg	Generate SVG as a web server

SVGo Clients

benchpng.txt

image/png package: Go 1.3 vs Go 1.4





```
structlayout -json bytes Reader | structlayout-svg -t bytes.Reader > reader.svg
```

Go Programming Language Release History

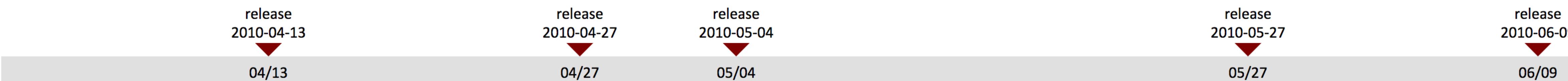
4Q 2009



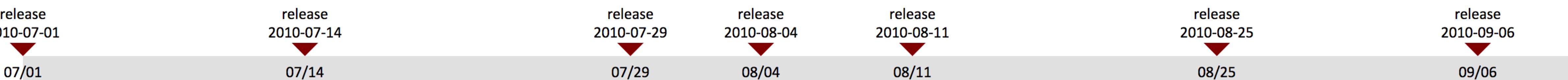
1Q 2010



2Q 2010



3Q 2010



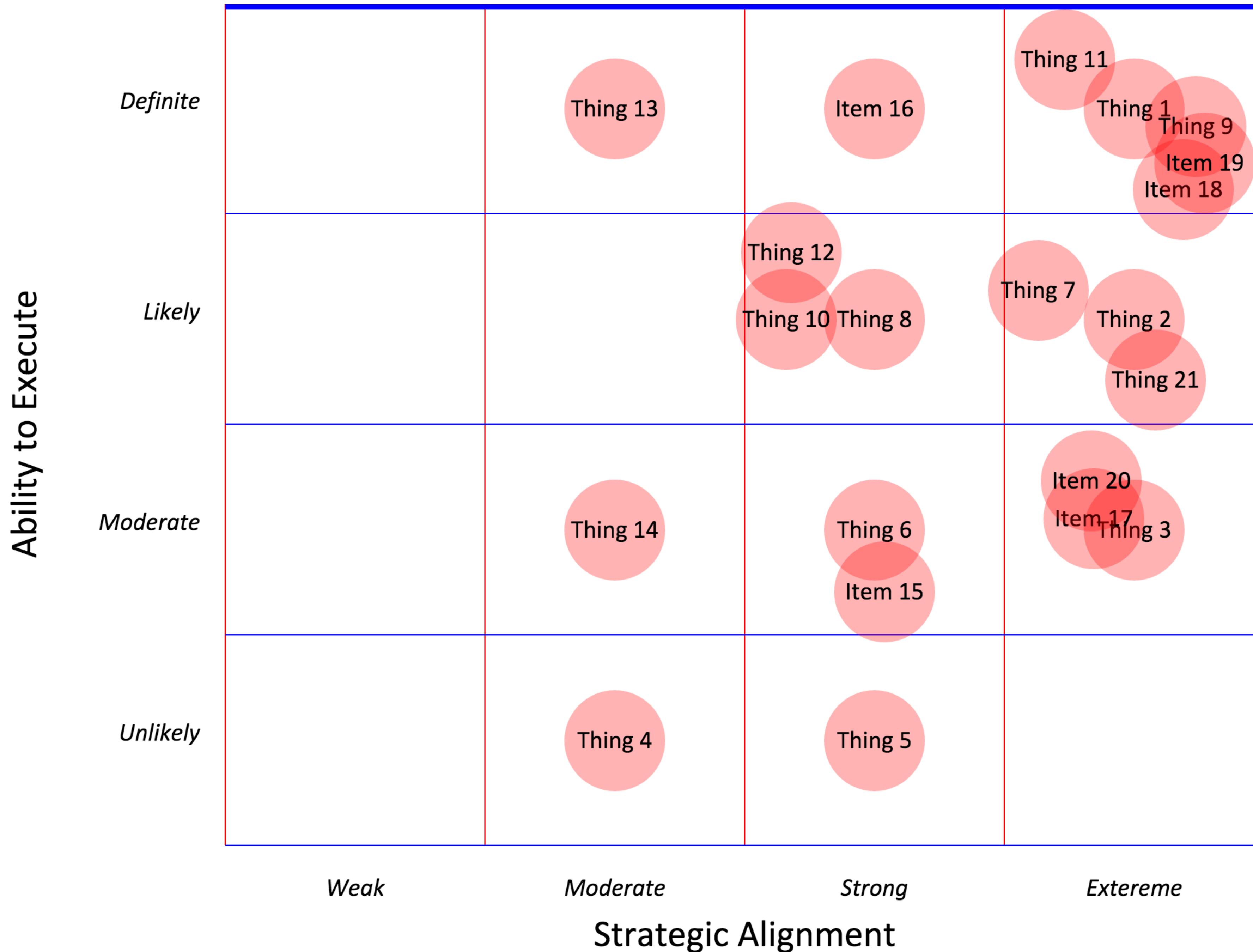
4Q 2010



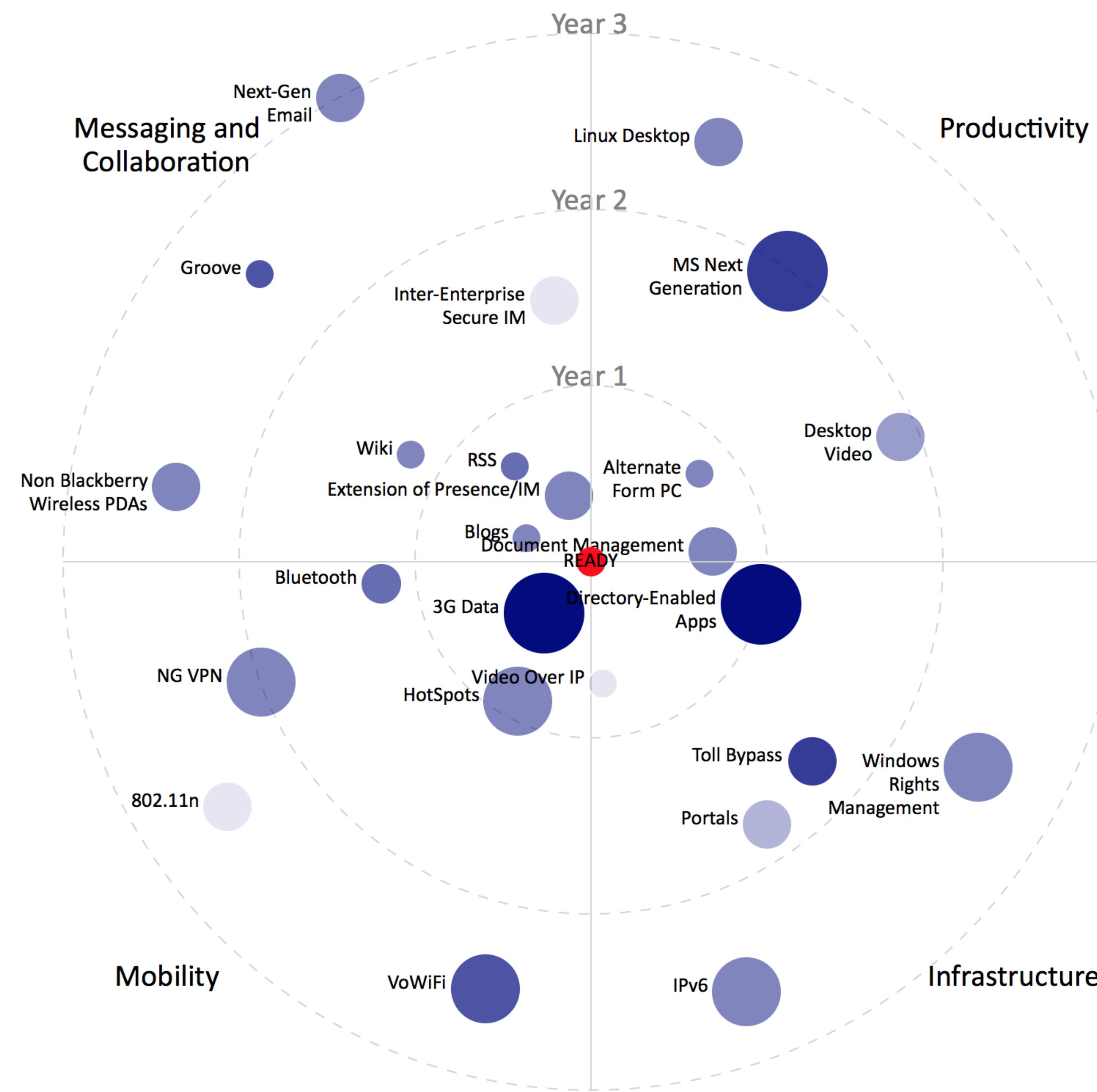


Sample Bullet Graph

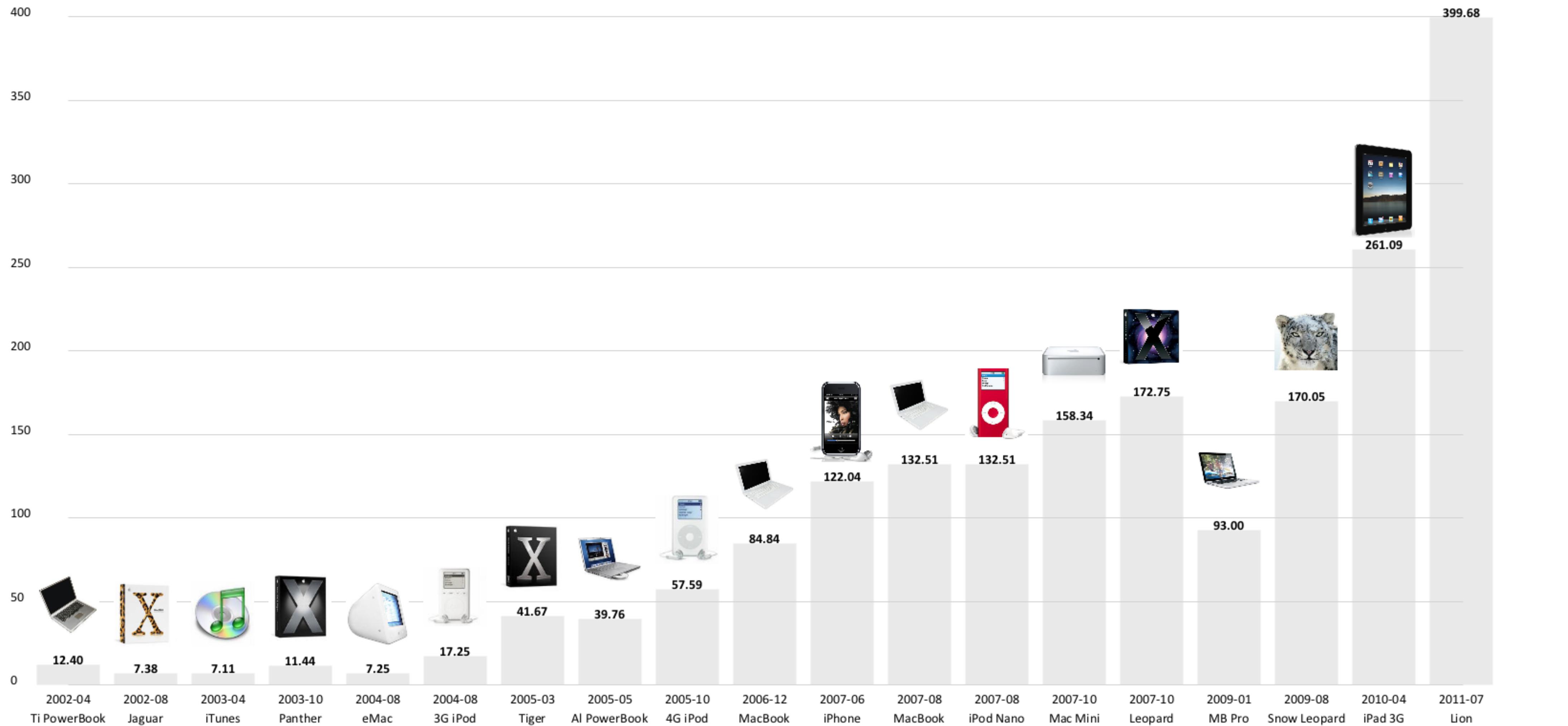
The bullet graph features a single, primary measure (for example, current year-to-date revenue) compares that measure to one or more other measures to enrich its meaning, for example, compared to a target), and displays it in the context of qualitative ranges of performance, such as poor, satisfactory, and good.



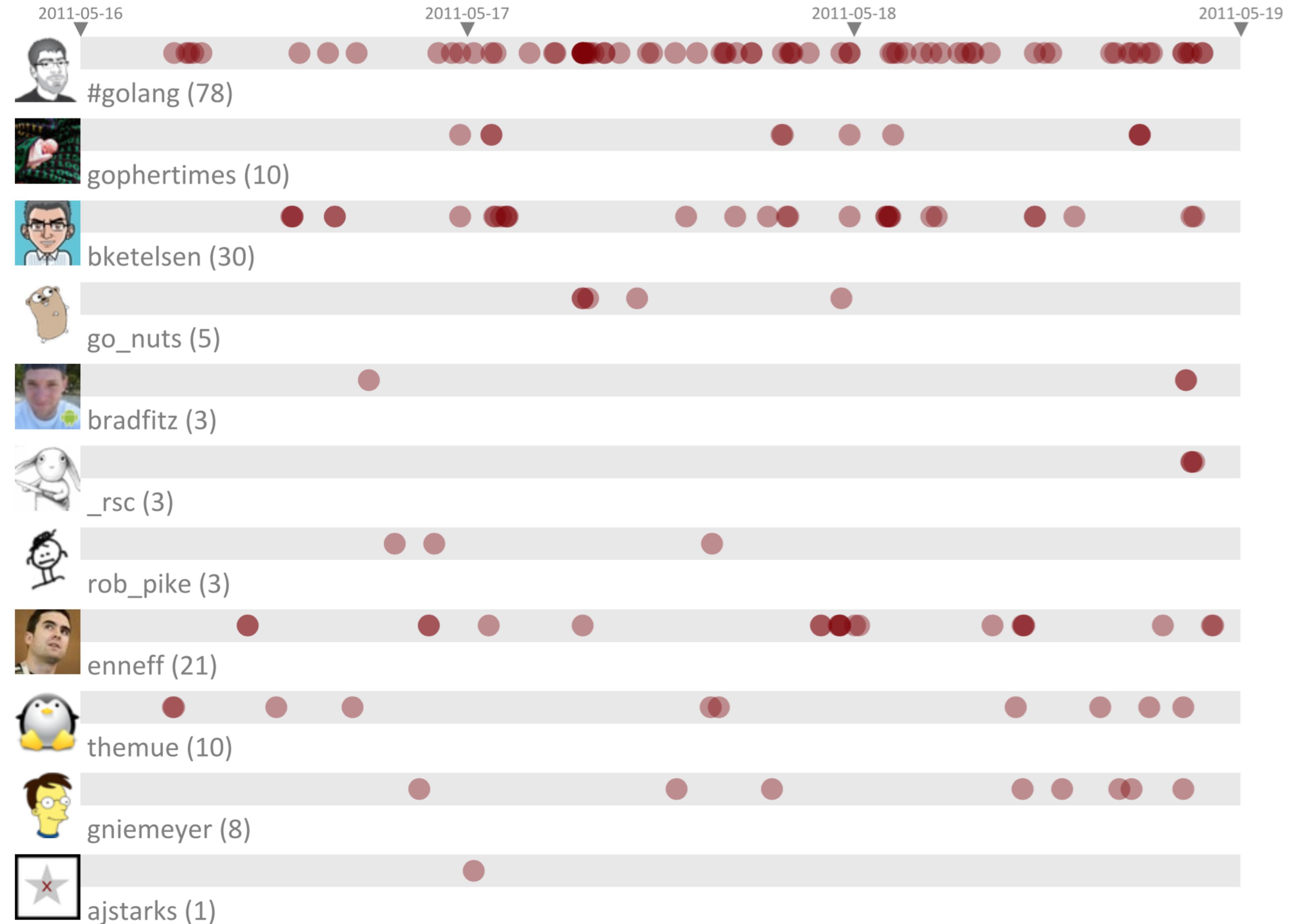




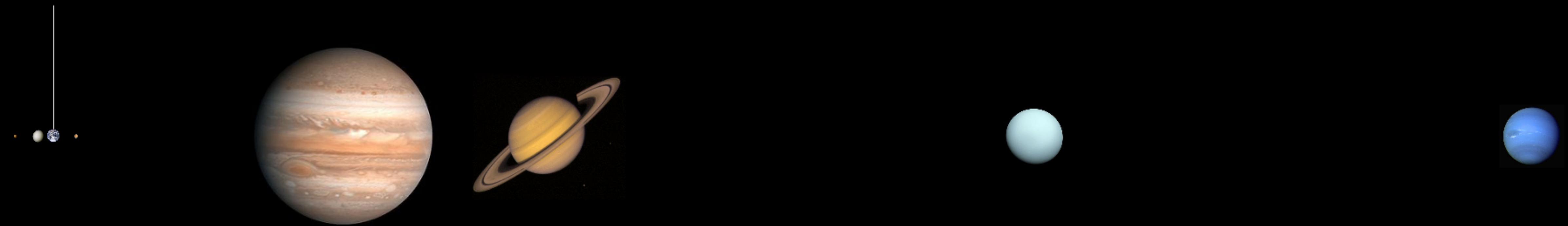
Apple Purchases and Stock Price



Twitter Update Frequency



You are here



JONES

- LAYER TENNIS SEASON 4 WEEK 6 MATCH COMMENTARY BY MIKE MONTEIRO -

MONTIEL



DKNG

- LAYER TENNIS SEASON 4 WEEK 7 MATCH COMMENTARY BY JOHN GRUBER -

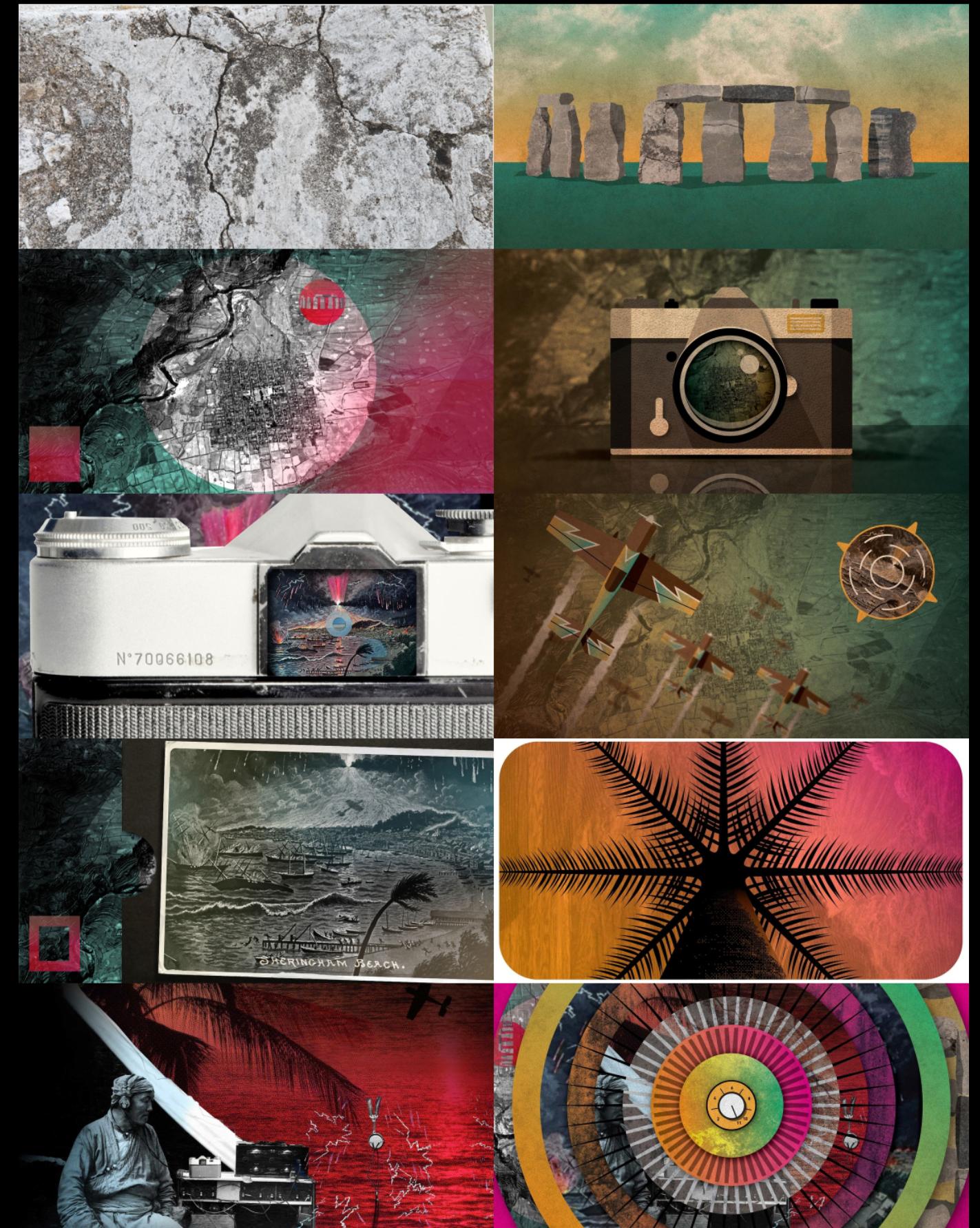
DDL



ANDERSON

- LAYER TENNIS SEASON 4 PLAYOFF QUARTERFINAL COMMENTARY BY BRYAN BEDELL -

DKNG



CONTINO
CASSARO



PUTNAM
STOCKS



WHITE
TAYLOR



HALL
WARREN



STRAWBERRY LUNA
DOUBLENAUT



JONES
MONTIEL



DKNG
DDL



SHAWNA X
STEVENS



TAYLOR
JONES



PUTNAM
RAJKUMAR



REYES
WHITE



ANDERSON
DKNG



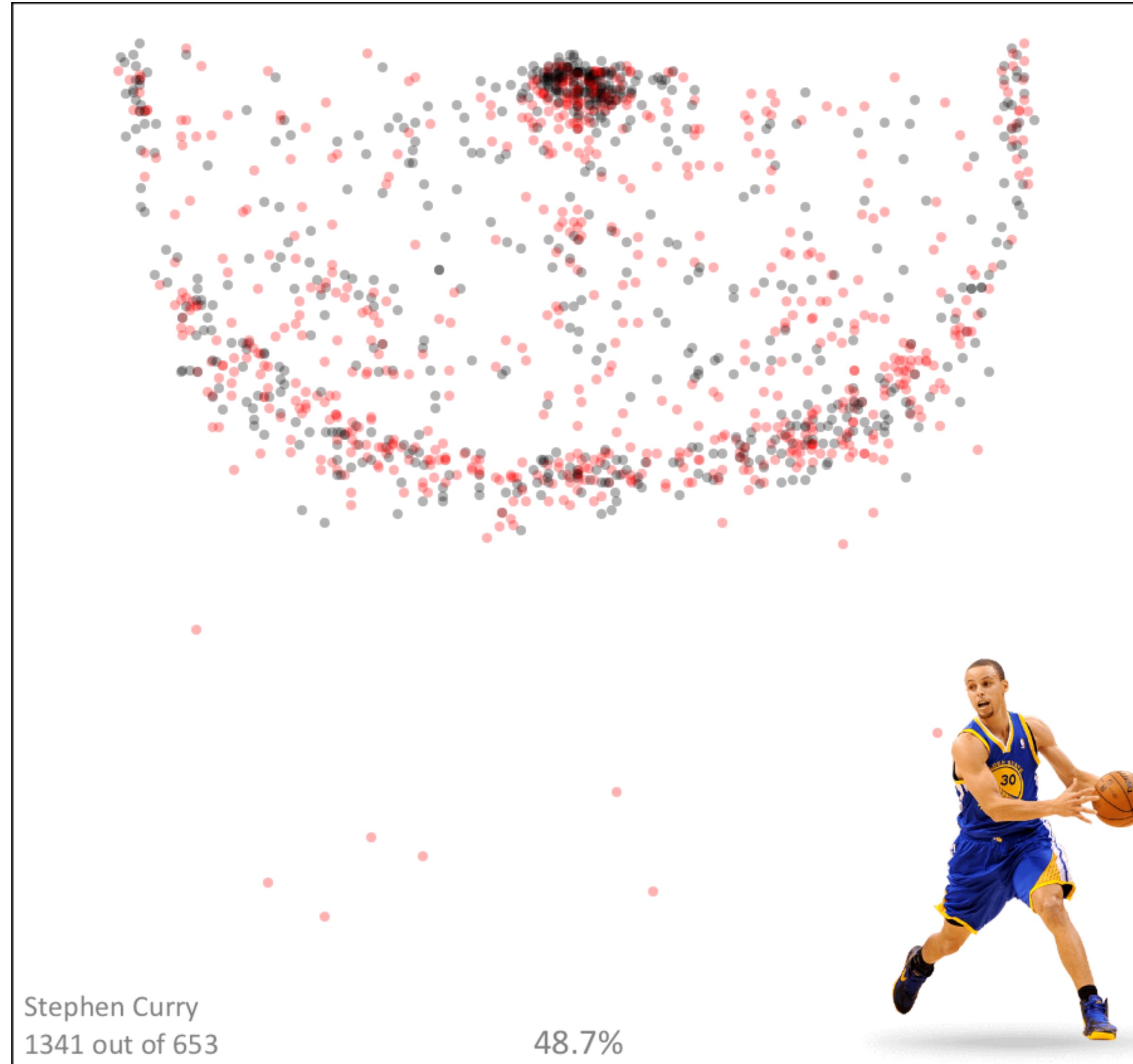
TAYLOR
WHITE



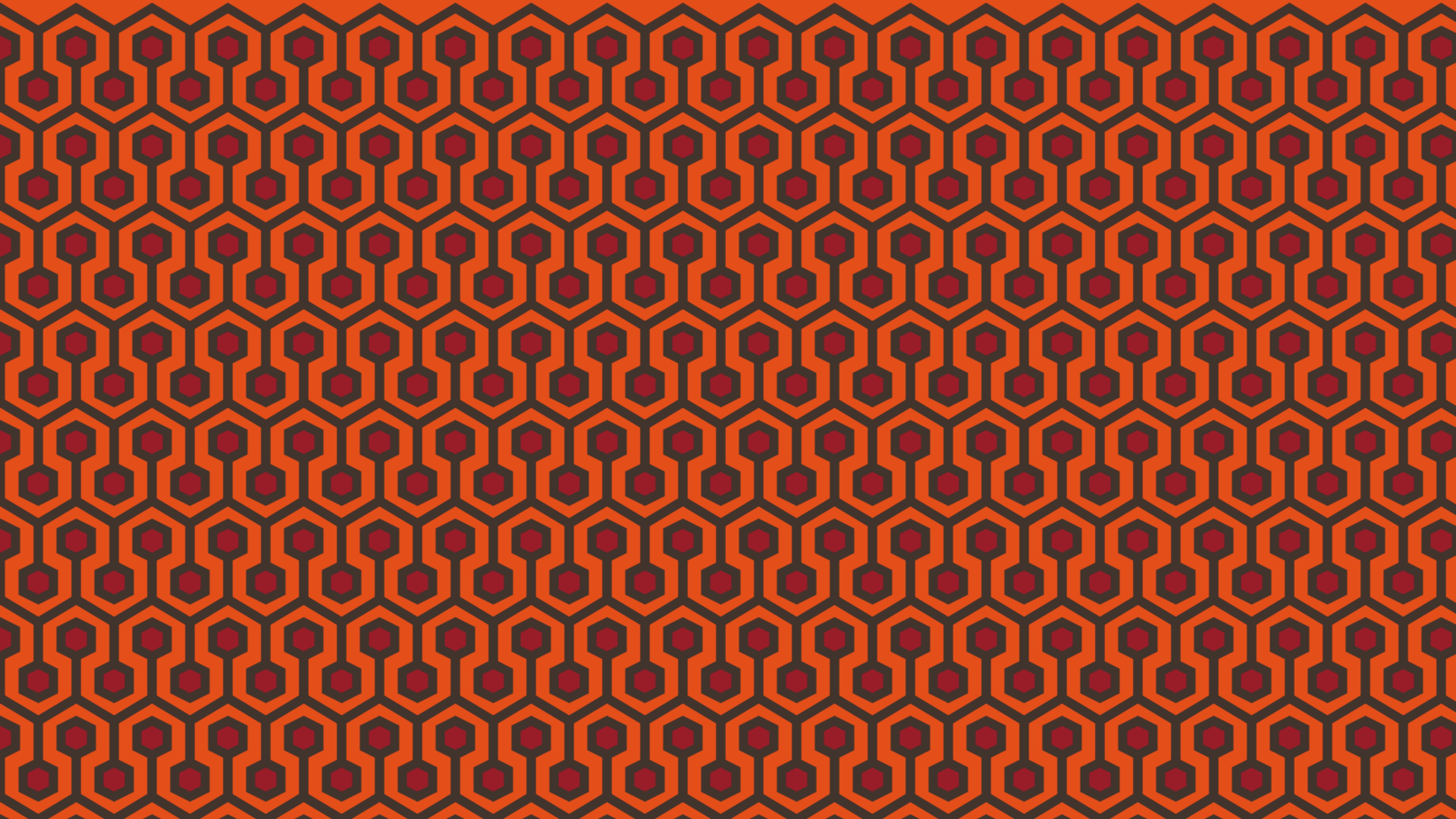
RAJKUMAR
ANDERSON



ANDERSON
WHITE









```
canvas.Def()
canvas.Gid("unit")
canvas.Polyline(xl, yl, "fill:none")
canvas.Polygon(xp, yp)
canvas.Gend()
```



```
canvas.Gid("runit")
canvas.TranslateRotate(150, 180, 180)
canvas.Use(0, 0, "#unit")
canvas.Gend()
canvas.Gend()
canvas.DefEnd()
```



```
for y := 0; < height; y += 130 {
    for x := 100; x < width; x+=100 {
        canvas.Use(x, y, "#unit")
        canvas.Use(x, y, "#runit")
    }
}
```

decksh → deck markup

SVG
PDF
PNG

```

deck
slide "rgb(250,250,250)" "black"
  ctext "Deck elements" 50 90 5
  image "follow.jpg"    70 50 640 480 50
  blist 10 75 3
    li "text, image, list"
    li "rect, ellipse, polygon"
    li "line, arc, curve"
  elist

  gy=10
  rect 15 gy 8 6      "rgb(127,0,0)"
  ellipse 27.5 gy 8 6   "rgb(0,127,0)"
  line 50 gy 60 gy
  curve 80 gy 95 30 90 gy
  arc 70 gy 10 8 0 180 0.1 "rgb(0,0,127)"
  polygon "37 37 45" "13 7 10" "rgb(0,0,127)"

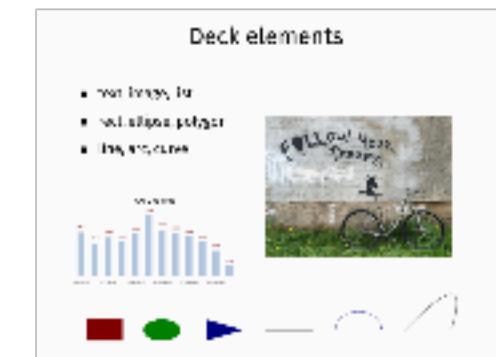
  opts="-fulldeck=f -textsize 1 - xlabel=2 -barwidth 1.5"
  dchart -left 10 -right 42 -top 42 -bottom 25 opts AAPL.d
eslide
edeck

```

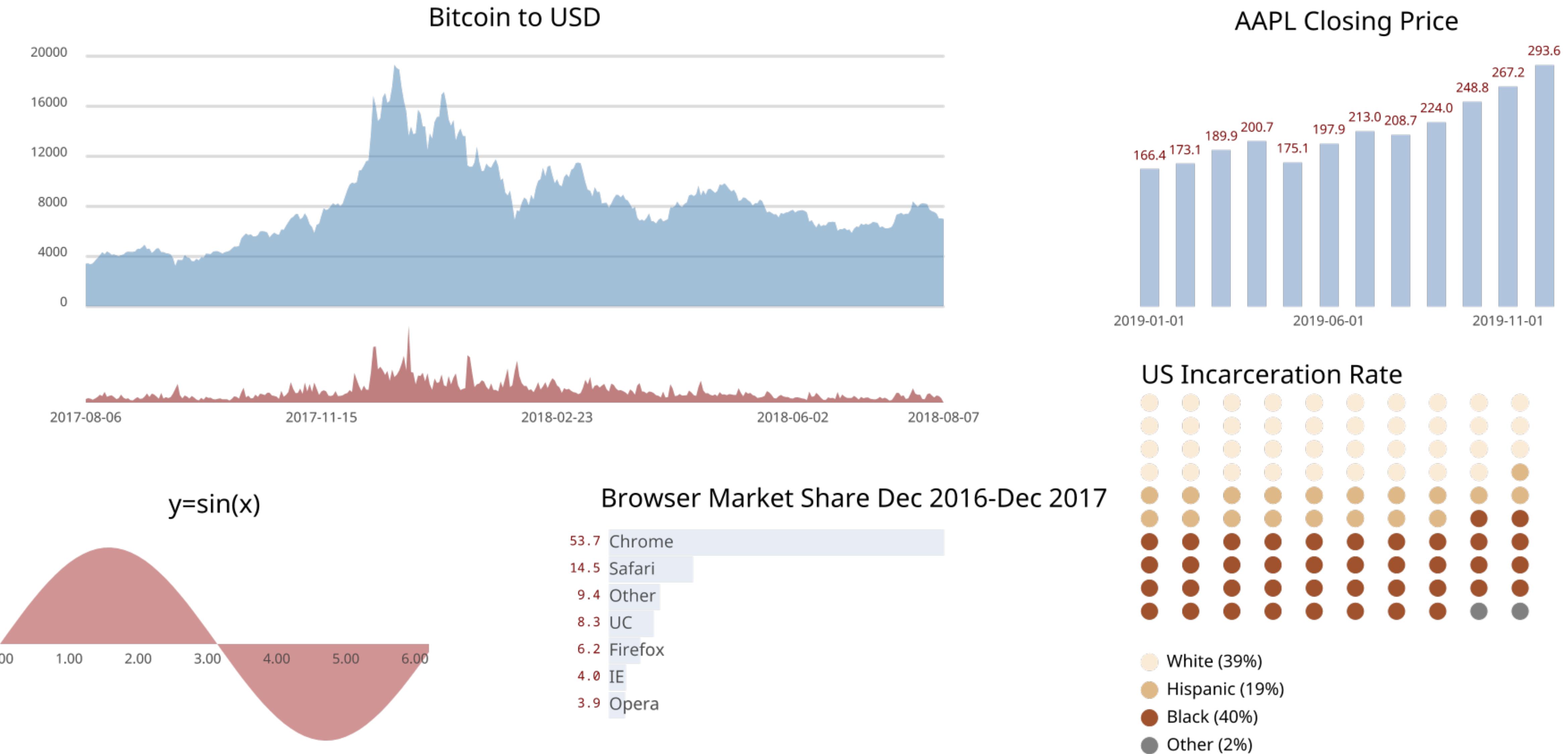
```

<deck>
<slide bg="rgb(250,250,250)" fg="black">
<text align="c" xp="50" yp="90" sp="5">Deck elements</text>
<image name="follow.jpg" xp="70" yp="50" width="640" height="480" scale="50" />
<list type="bullet" xp="10" yp="75" sp="3">
<li>text, image, list</li>
<li>rect, ellipse, polygon</li>
<li>line, arc, curve</li>
</list>
<rect xp="15" yp="10" wp="8" hp="6" color="rgb(127,0,0)" />
<ellipse xp="27.5" yp="10" wp="8" hp="6" color="rgb(0,127,0)" />
<line xp1="50" yp1="10" xp2="60" yp2="10" />
<curve xp1="80" yp1="10" xp2="95" yp2="30" xp3="90" yp3="10" />
<arc xp="70" yp="10" wp="10" hp="8" a1="0" a2="180" sp="0.1" color="rgb(0,0,127)" />
<polygon xc="37 37 45" yc="13 7 10" color="rgb(0,0,127)" />
<text xp="26.00" yp="45.60" sp="1.50" align="center" wp="0.00" font="sans" opacity="100.00"
color="black" type="">AAPL Volume</text>
<line xp1="10.00" yp1="25.00" xp2="10.00" yp2="37.46" sp="1.50" opacity="100.00"
color="lightsteelblue" />
<text xp="10.00" yp="38.46" sp="0.75" align="center" wp="0.00" font="sans" opacity="100.00"
color="rgb(127,0,0)" type="">679.9</text>
<text xp="10.00" yp="23.00" sp="0.80" align="center" wp="0.00" font="sans" opacity="100.00"
color="rgb(75,75,75)" type="">2017-09-01</text>
<line xp1="12.91" yp1="25.00" xp2="12.91" yp2="34.24" sp="1.50" opacity="100.00"
color="lightsteelblue" />
<text xp="12.91" yp="35.24" sp="0.75" align="center" wp="0.00" font="sans" opacity="100.00"
color="rgb(127,0,0)" type="">504.3</text>
...
</slide>
</deck>

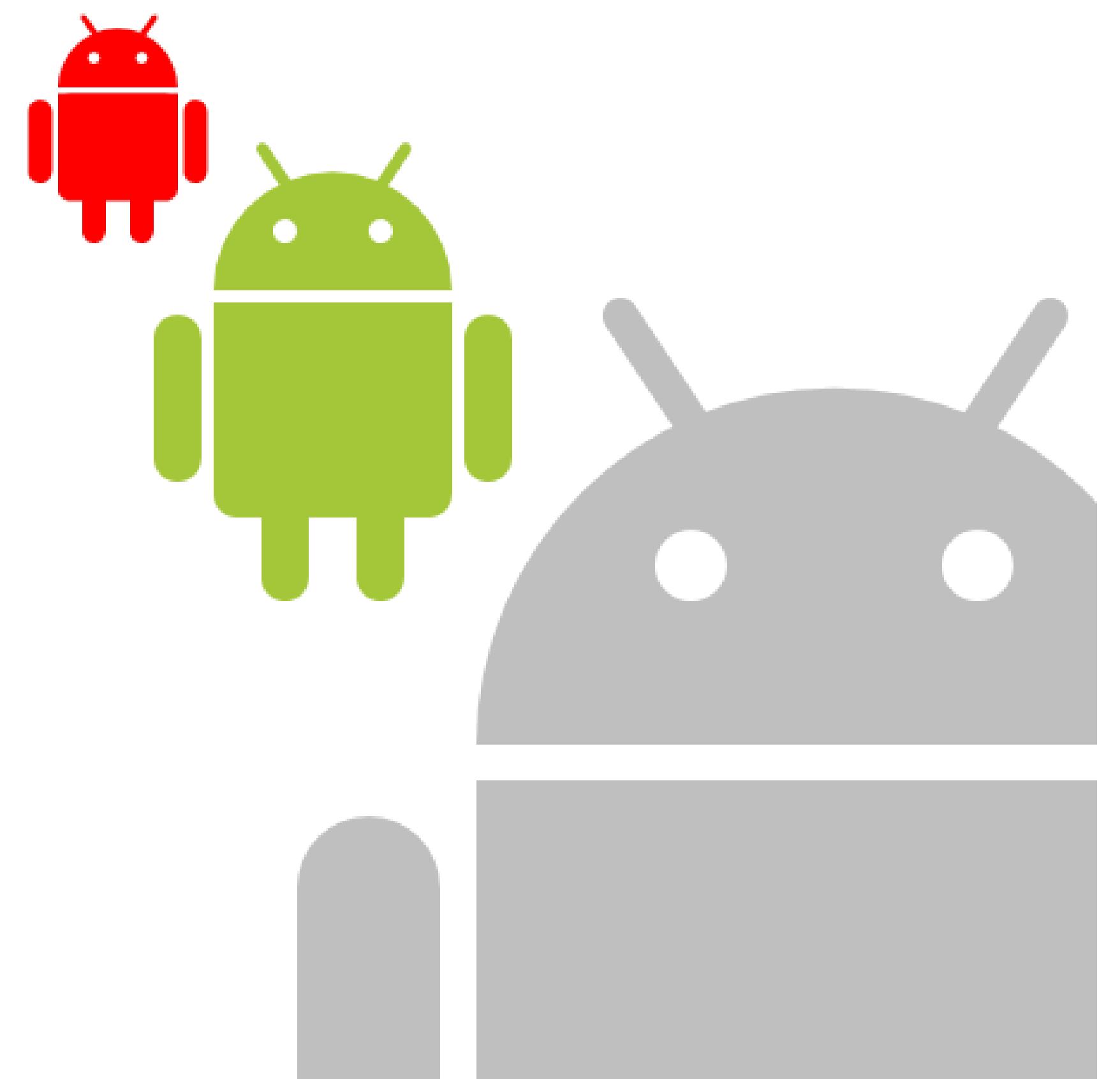
```



dchart: charts for deck/decksh



SVGo API Design



Scale



Roundrect



rgb(164,198,57)

Line

Circle

Arc

Line

Rect

Element

Rect

Arguments

(100,200,250,125)

```
<rect x="100" y="200" width="250" height="125"/>
```

(100, 200)



125

250

Element	Arguments	CSS Style
Rect	(100,200,250,125, "fill:gray;stroke:blue")	

```
<rect x="100" y="200" width="250" height="125"  
      style="fill:gray;stroke:blue"/>
```

(100, 200)



125

250

Element

Rect

Arguments

(100,200,250,125,

`id='box'`, `fill='gray'`, `stroke='blue'`)

Attributes

```
<rect x="100" y="200" width="250" height="125"  
      id='box' fill='gray' stroke='blue'/>
```

(100, 200)



125

250

Y

(0,0)



height

X

(width/2, height/2)

(width, height)

width

Rect(0,0,width,height)

hello,world

(width/2, height/2)

(width/2, height)

```
package main

import (
    "os"
    "github.com/ajstarks/svg"
)

func main() {
    width := 960
    height := 540
    style := "fill:white;font-size:60pt;text-anchor:middle"
    canvas := svg.New(os.Stdout)
    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height)
    canvas.Circle(width/2, height, width/2, "fill:rgb(44,77,232)")
    canvas.Text(width/2, height/2, "hello, world", style)
    canvas.End()
}
```



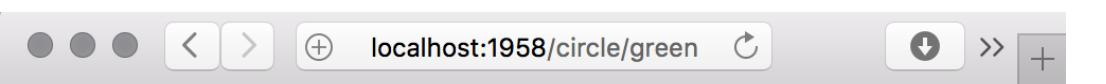
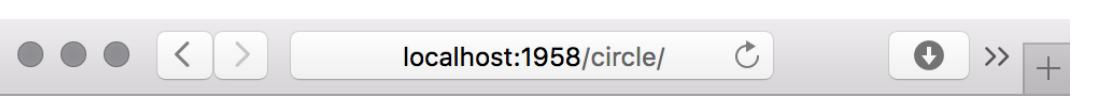
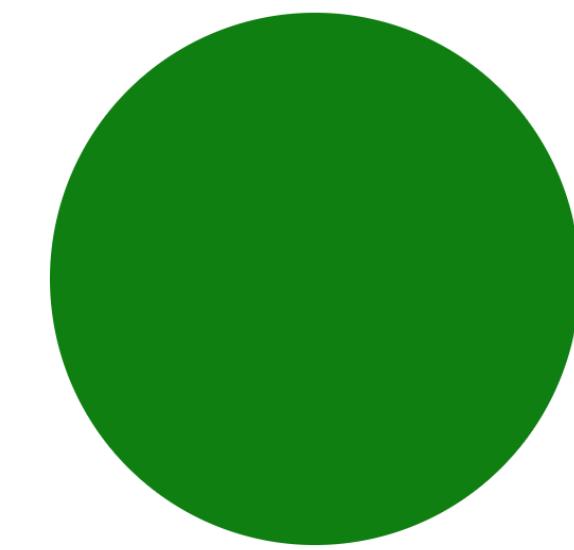
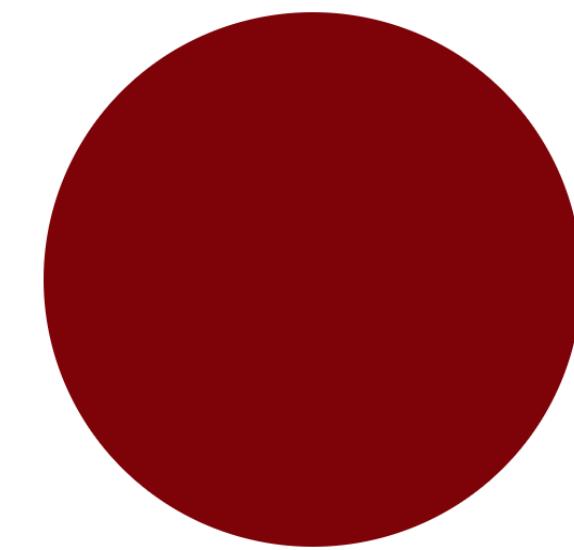
/circle

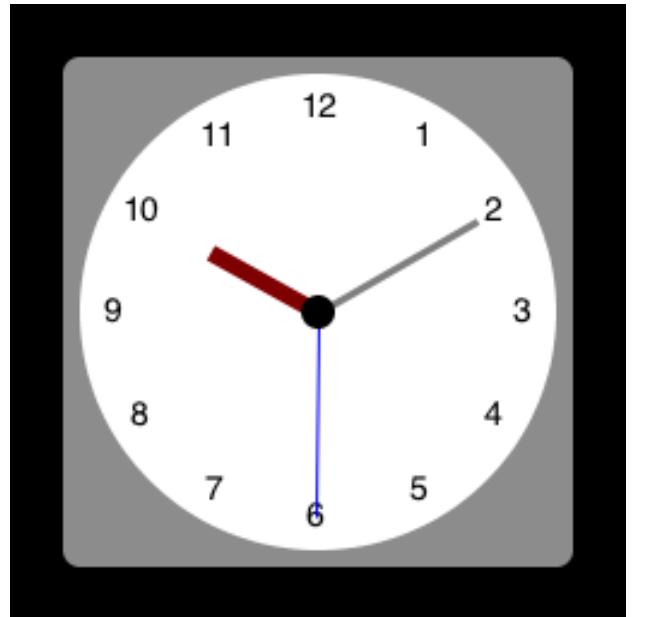
```
const defaultstyle = "fill:rgb(127,0,0)"

func circle(w http.ResponseWriter, req *http.Request) {
    w.Header().Set("Content-Type", "image/svg+xml")
    s := svg.New(w)
    s.Start(500, 500)
    s.Title("Circle")
    s.Circle(250, 250, 125, shapestyle(req.URL.Path))
    s.End()
}
```

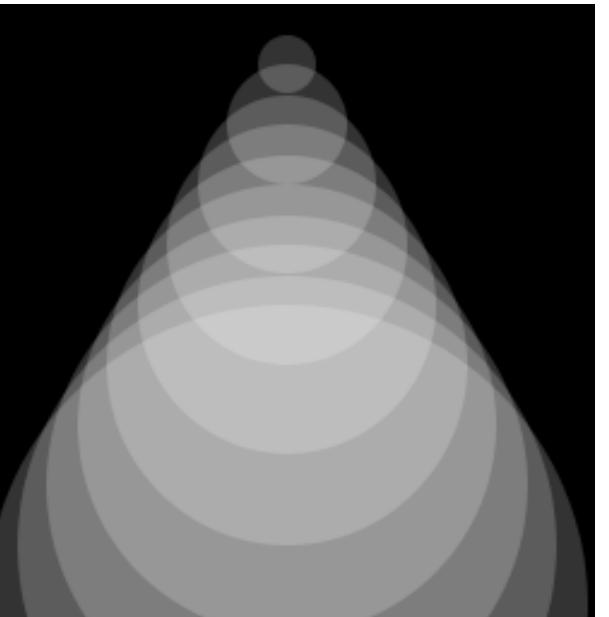
/circle/green

```
func shapestyle(path string) string {
    i := strings.LastIndex(path, "/") + 1
    if i > 0 && len(path[i:]) > 0 {
        return "fill:" + path[i:]
    }
    return defaultstyle
}
```

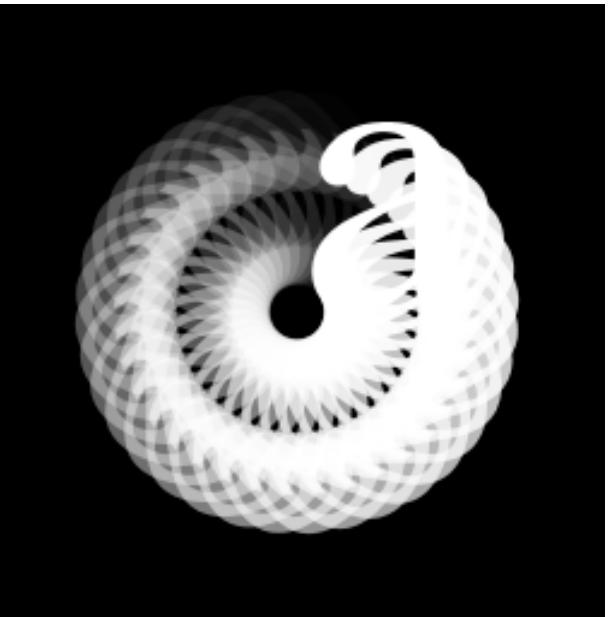




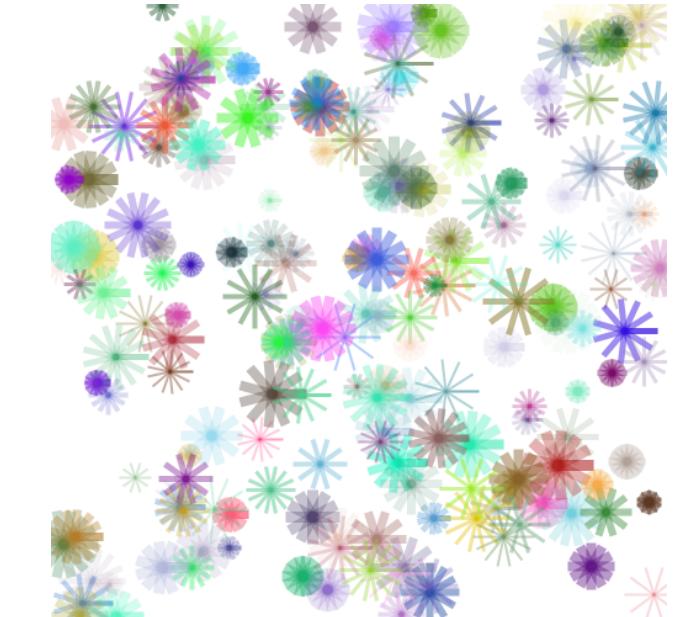
clock



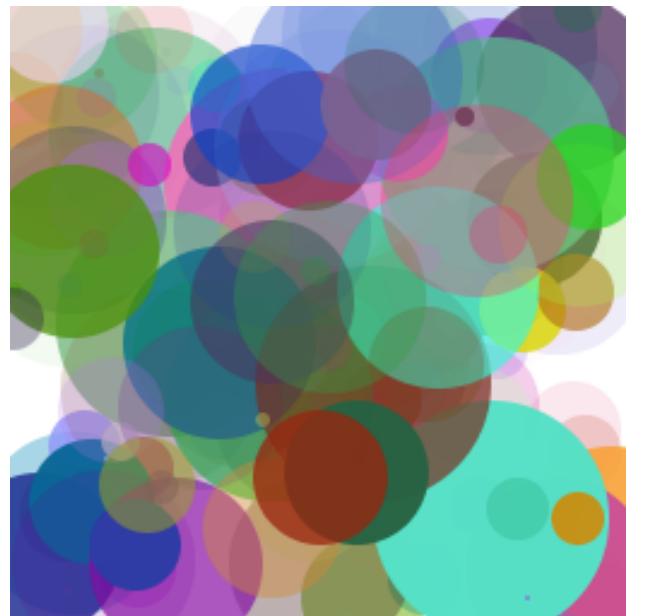
funnel



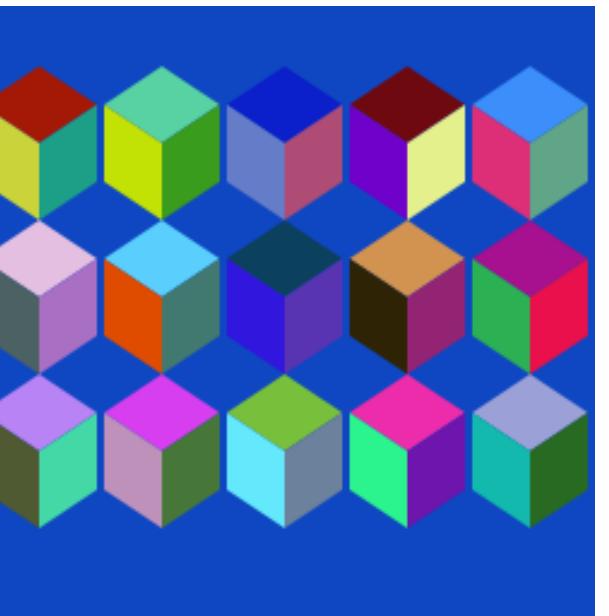
rotext



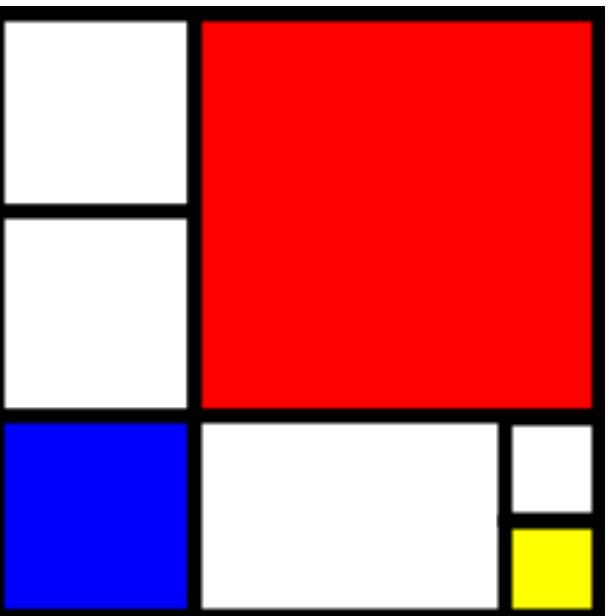
flower



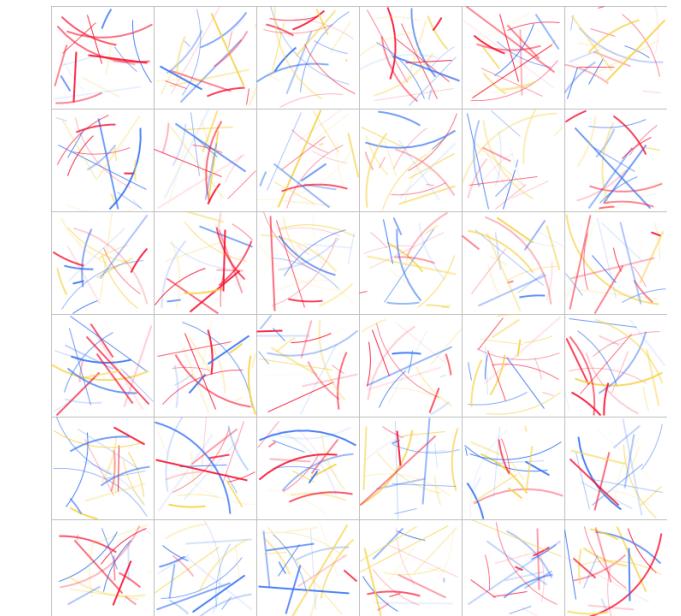
rshape



cube



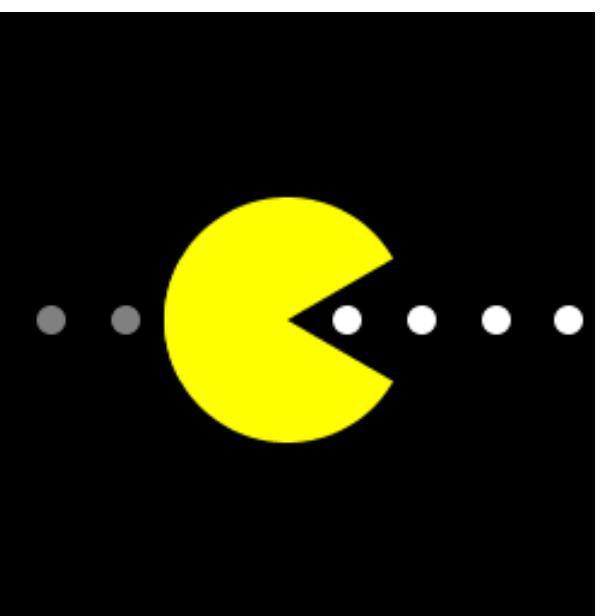
mondrian



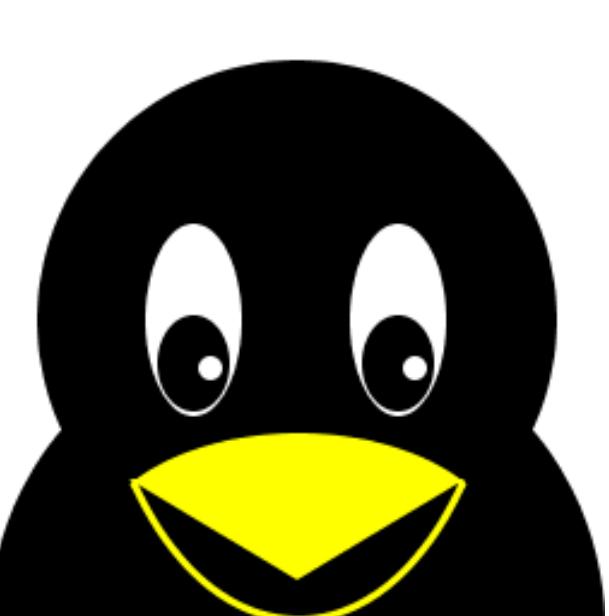
lewitt



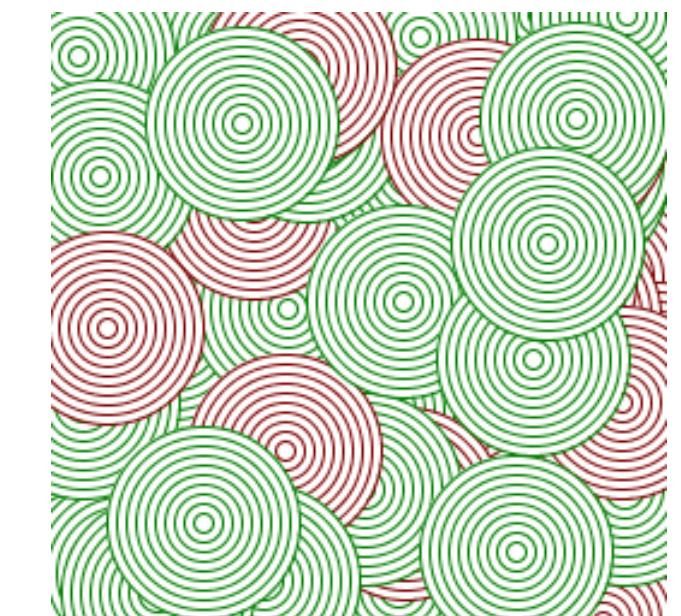
face



pacman

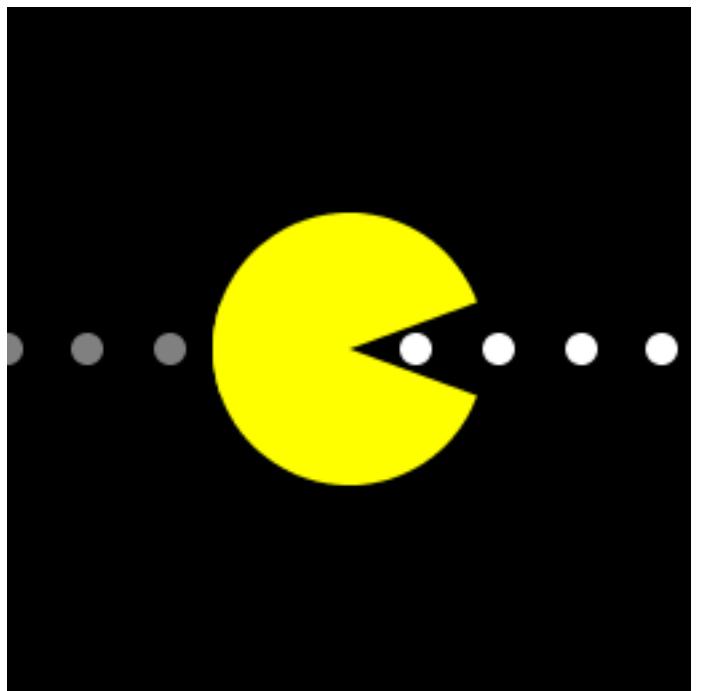


tux

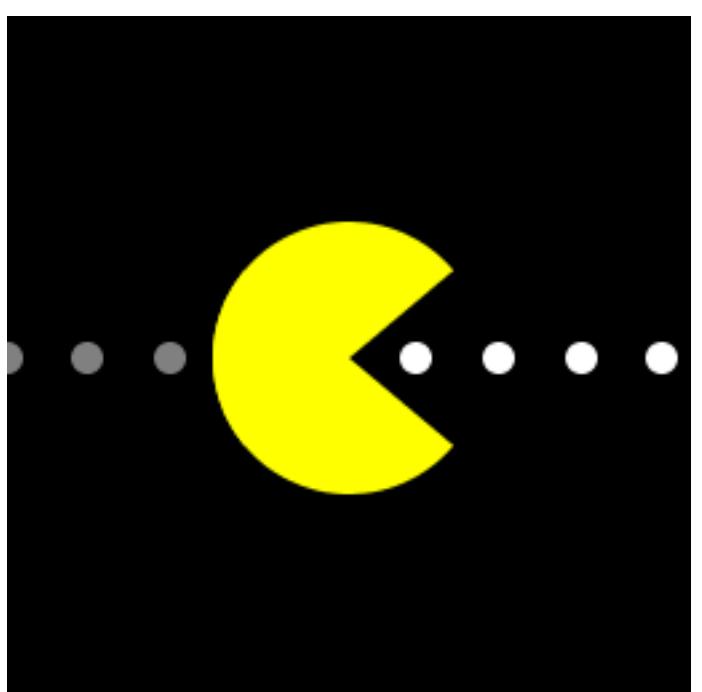


concentric

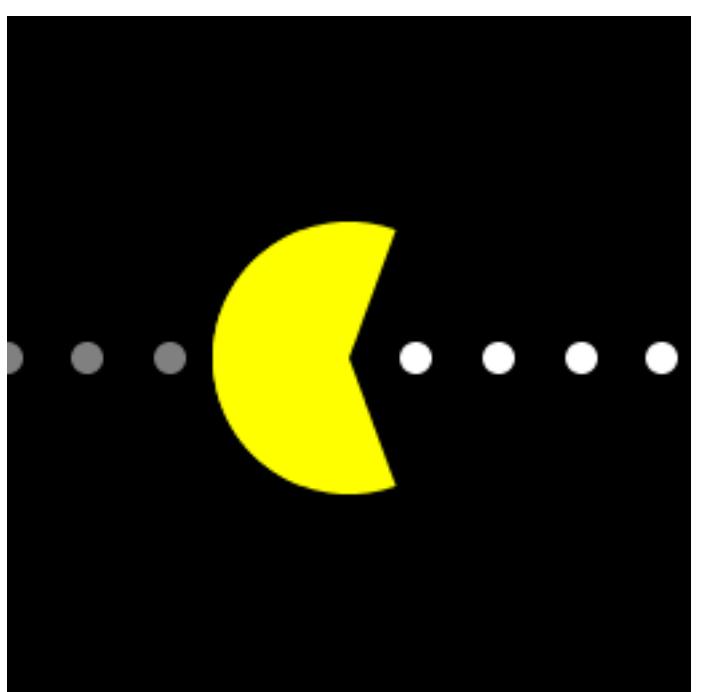
/pacman/?angle=20



/pacman/?angle=40



/pacman/?angle=70

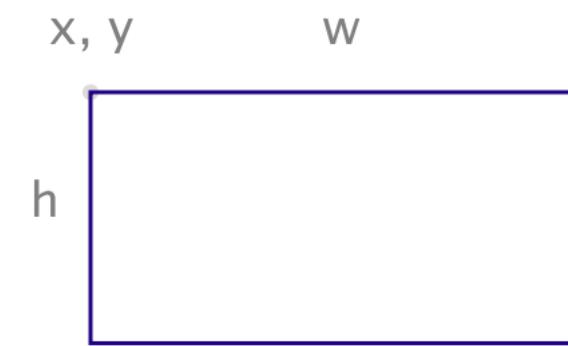


API Reference

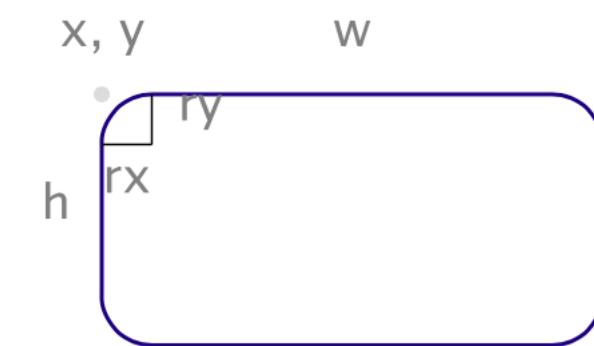
SVGo Method Categories

- Shapes
- Paths, Lines and Curves
- Text and Images
- Colors and Gradients
- Transforms
- Animation
- Filter Effects
- Starting and Ending
- Metadata
- Utility
- Groups and Definitions
- Markers and Patterns
- Links
- Masking and Clipping

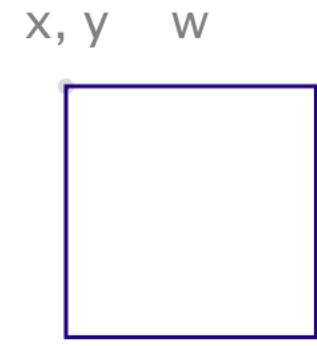
Shapes



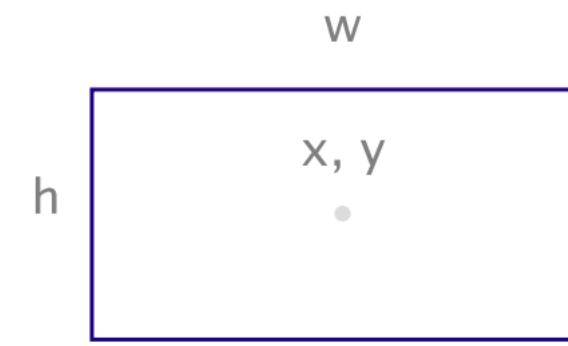
Rect(x, y, w, h int, s string...)



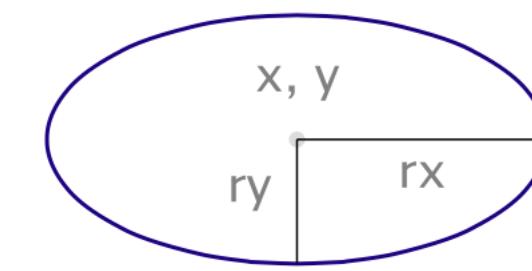
Roundrect(x, y, w, h, rx, ry int, s string...)



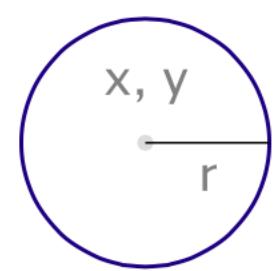
Square(x, y, l int, s string...)



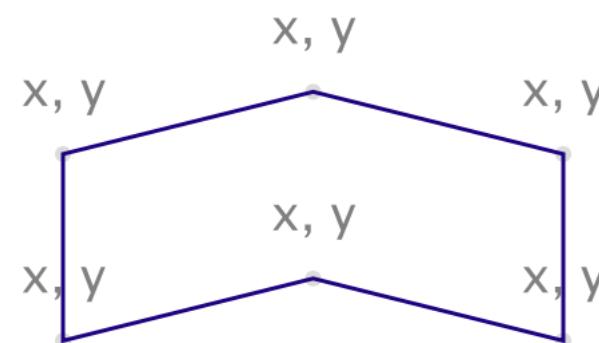
CenterRect(x, y, w, h int, s string...)



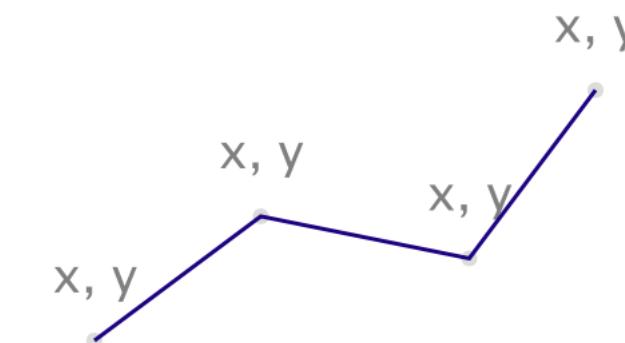
Ellipse(x, y, w, h int, s string...)



Circle(x, y, r int, s string...)



Polygon(x, y []int, s string...)



Polyline(x, y []int, s string...)

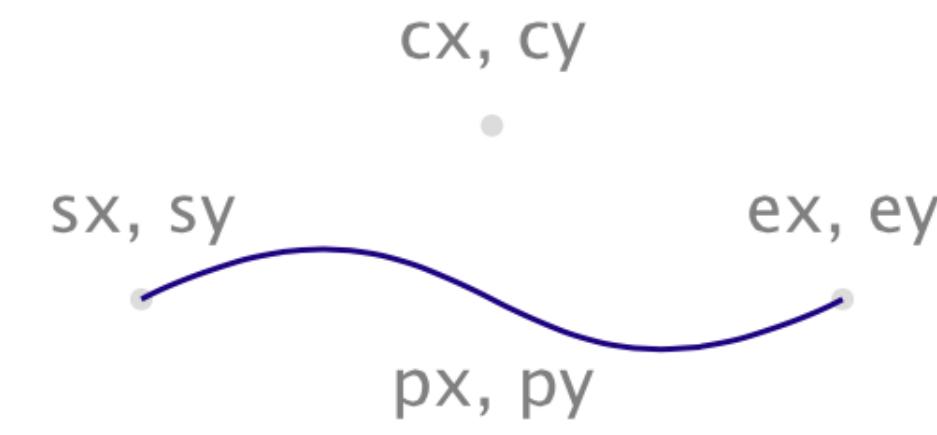


Line(x1, y1, x2, y2 int, s string...)

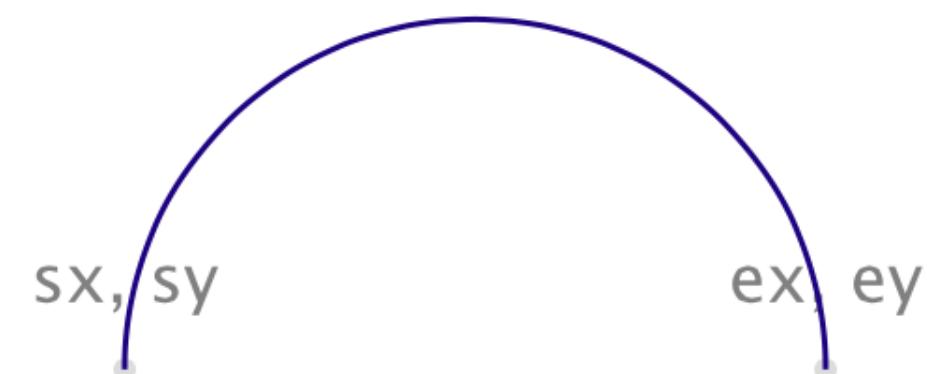
Curves and Paths



`Bezier(sx, sy, cx, cy, ex, ey int, s string...)`



`QBez(sx, sy, cx, cy, px, py, ex, ey int, s string...)`



`Arc(sx, ax, ay, r int, dir, large bool, ex, ey int, s string...)`



`Path(d string, s string...)`

Text and Images

hello, this is SVG
x, y

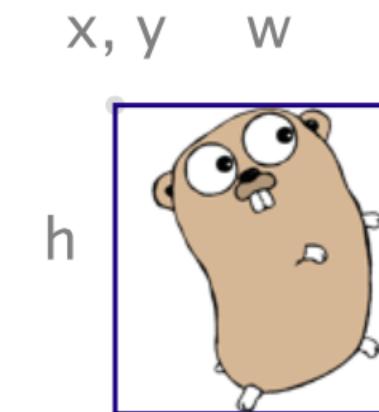
Text(x, y int, s string, s ...string)

It's "fine" & "dandy" to draw text along

Textpath(t string, pathid string, s ...string)

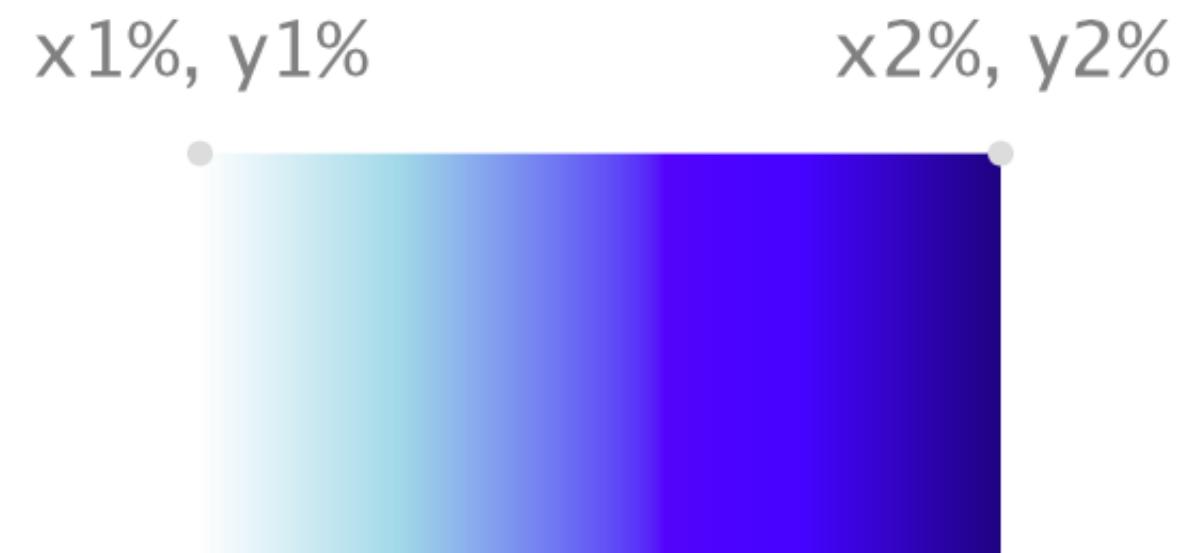
```
New(w io.Writer)  
Start(w, h int, options ...string)/End()  
Startview(w, h, minx, miny, vw, vh int)  
Group(s ...string)/Gend()  
Gstyle(s string)/Gend()
```

Textlines(x, y int, s []string, size, spacing int, fill, align string)

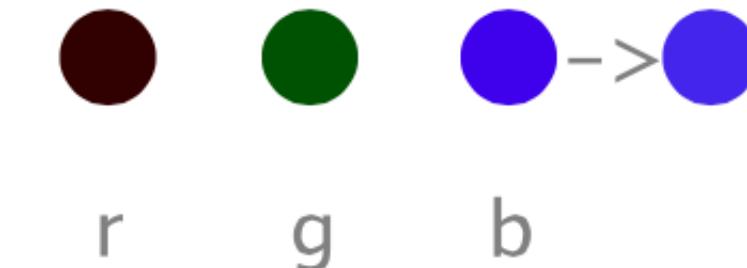


Image(x, y, w, h int, link string, s ...string)

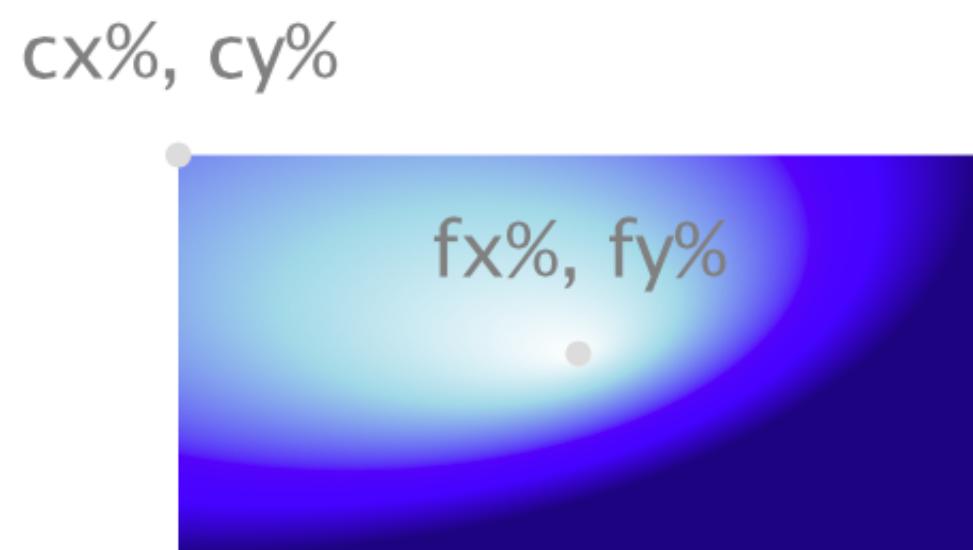
Gradients and Colors



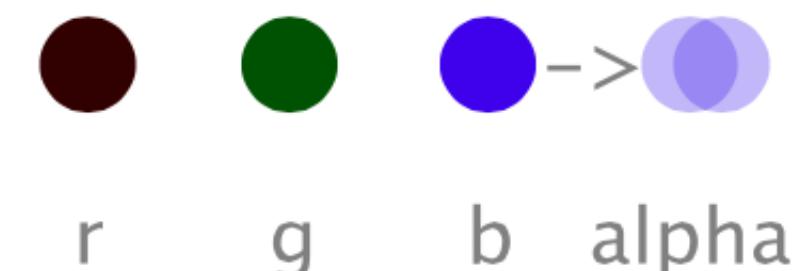
LinearGradient(id string, x1, y1, x2, y2 uint8, sc []Offcolor)



RGB(r, g, b int)

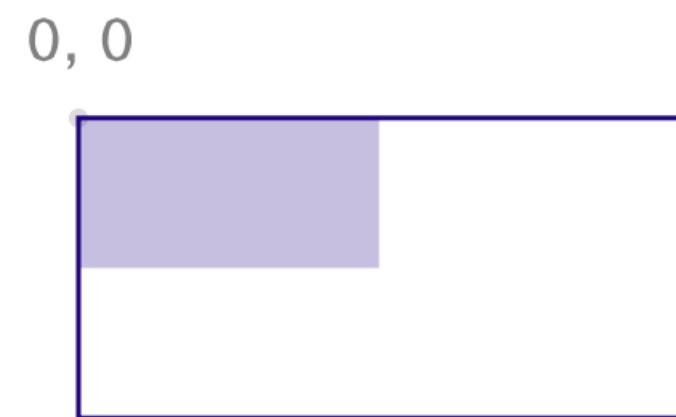


RadialGradient(id string, cx, cy, r, fx, fy uint8, sc []Offcolor)

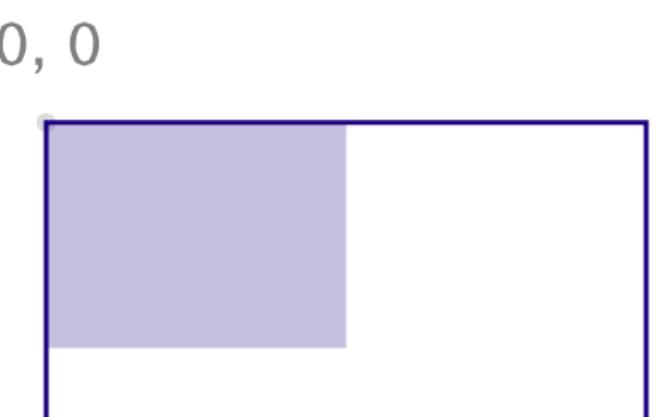


RGBA(r, g, b int, a float64)

Transforms



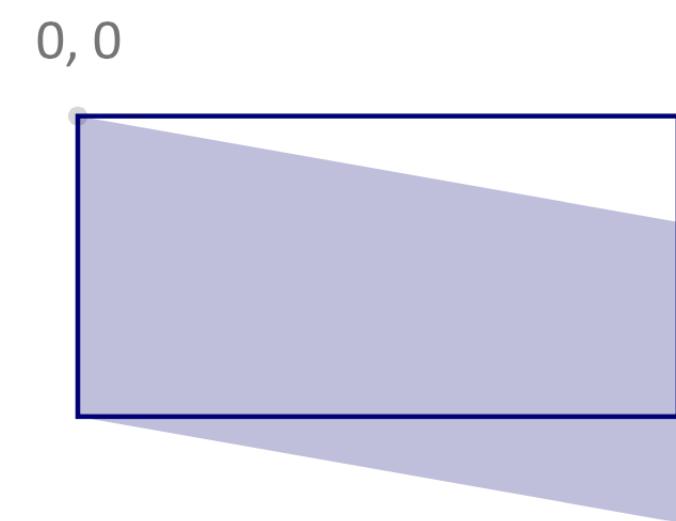
Scale(n float64)



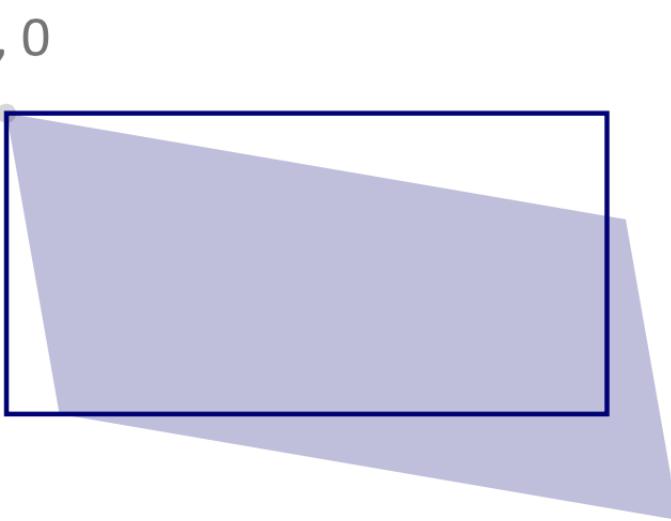
ScaleXY(dx, dy float64)



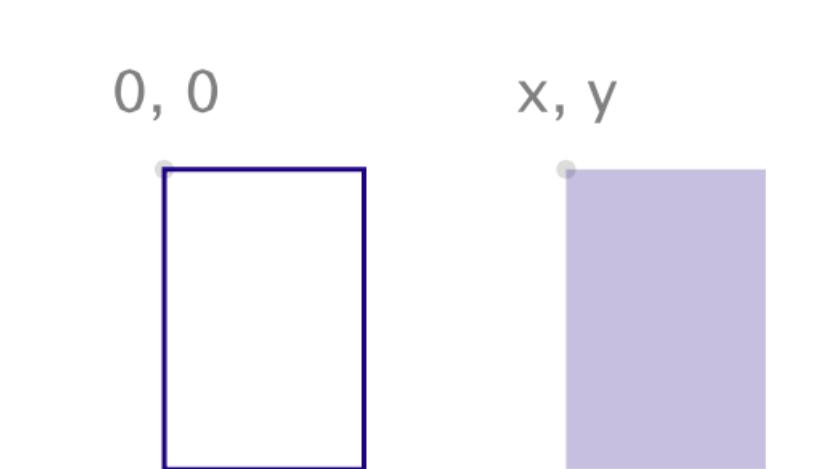
SkewX(a float64)



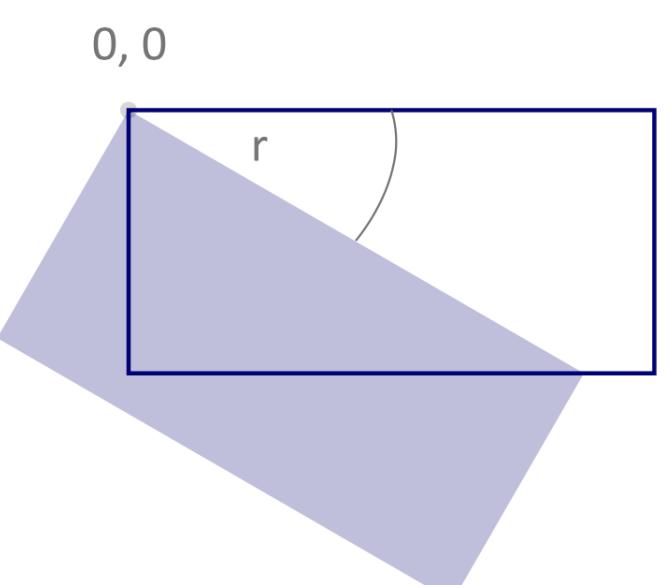
SkewY(a float64)



SkewXY(ax, ay float64)

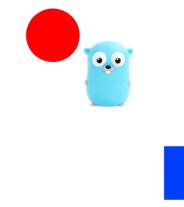


Translate(x, y int)

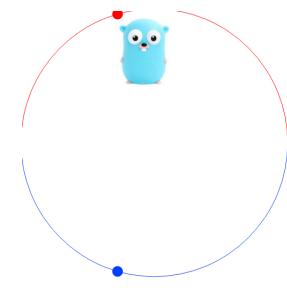


Rotate(a float64)

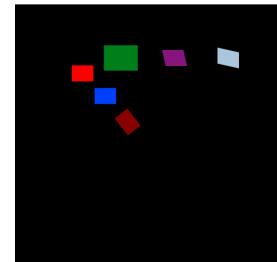
Animation



Animate(link, attr string, from, to int, duration float64, repeat int, s ...string)



AnimateMotion(link, path string, duration float64, repeat int, s ...string)



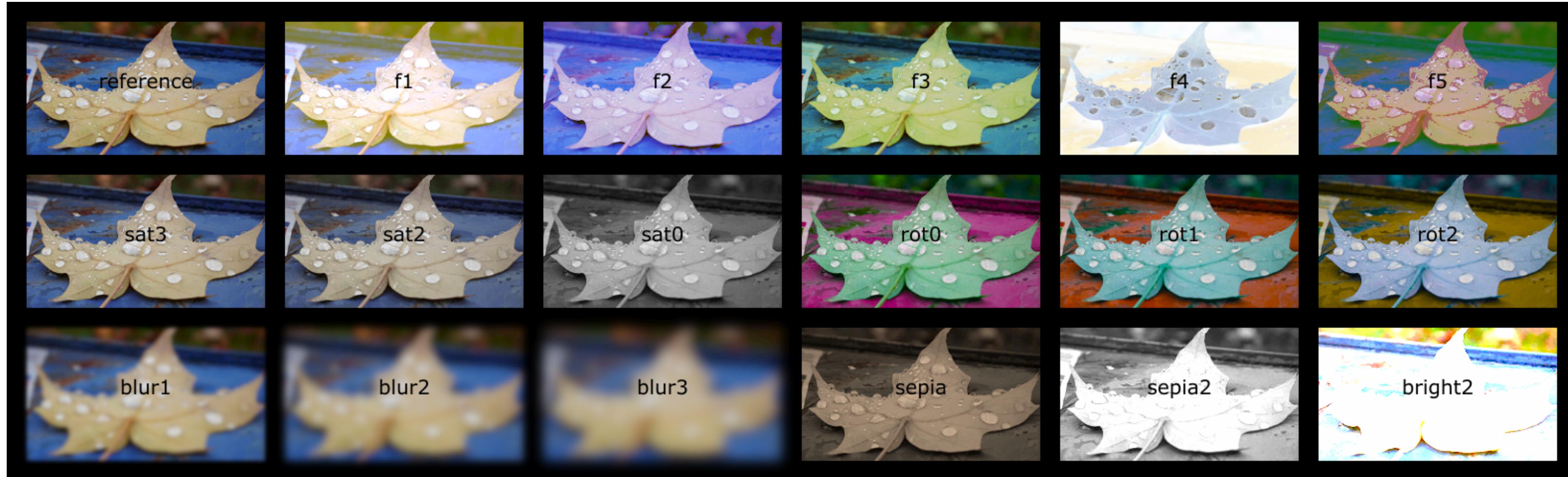
AnimateRotate(link string, fs, fc, fe, ts, tc, te int, duration float64, repeat int, s ...string)

AnimateScale(link string, from, to, duration float64, repeat int, s ...string)

AnimateSkewX(link string, from, to, duration float64, repeat int, s ...string)

AnimateSkewY(link string, from, to, duration float64, repeat int, s ...string)

Filter Effects



Sketching with code

```
package main

import (
    "os"
    "github.com/ajstarks/svg"
)

func main() {
    width := 960
    height := 540
    style := "fill:white;font-size:60pt;text-anchor:middle"
    canvas := svg.New(os.Stdout)
    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height)
    canvas.Circle(width/2, height, width/2, "fill:rgb(44,77,232)")
    canvas.Text(width/2, height/2, "hello, world", style)
    canvas.End()
}
```



(Shift-Enter to compile and run.)



Compile and run after each keystroke

```
package main

import (
    "os"
    "github.com/ajstarks/svg"
)

func main() {
    width := 960
    height := 540
    style := "fill:white;font-size:60pt;text-anchor:middle"
    canvas := svg.New(os.Stdout)
    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height)
    canvas.Circle(width/2, height, width/2, "fill:red")
    canvas.Text(width/2, height/2, "hello, Mars", style)
    canvas.End()
}
```



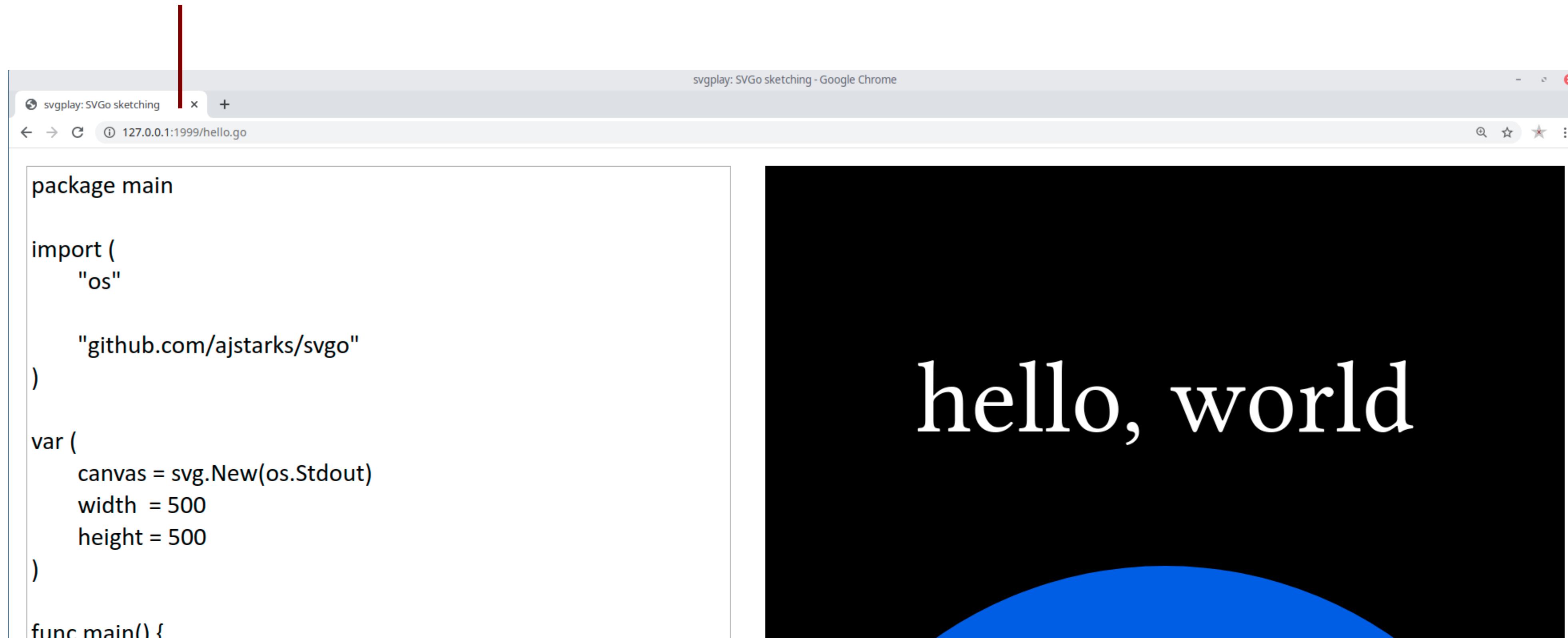
(Shift-Enter to compile and run.)



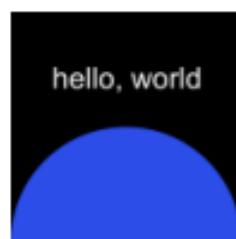
Compile and run after each keystroke

Running svgplay

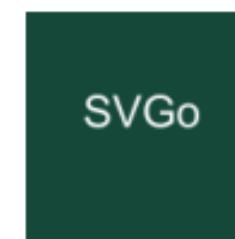
```
$ git clone https://github.com/ajstarks/svgo-workshop  
$ cd svgo-workshop/code/svgplay-samples  
$ svgplay  
svgplay 2020/02/28 17:58:43 * * * Warning: ...  
http://127.0.0.1:1999/hello.go
```



SVGo Examples



hello.go



SVGo



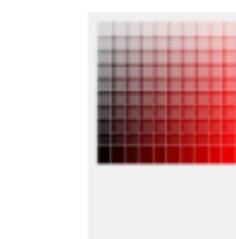
rl.go



concentric.go



concentric2.go



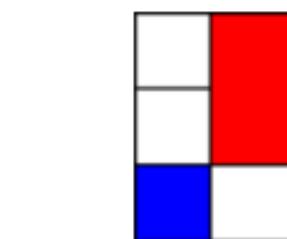
cgrid.go



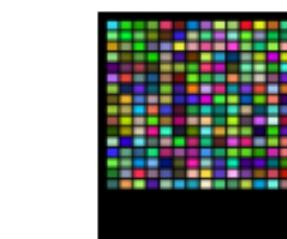
diag.go



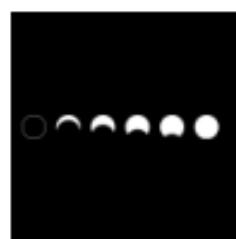
shining.go



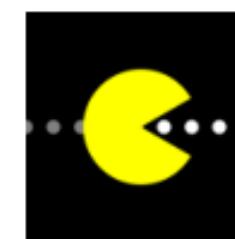
mondrian.go



richter.go



eclipse.go



pacman.go



pyramid.go



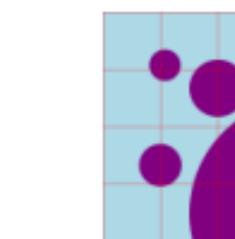
cloud.go



color-clouds.go



creepy.go



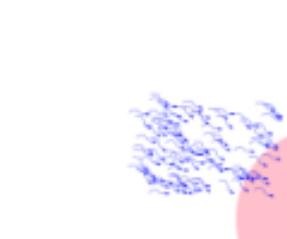
d4h.go



sunearth.go



conception.go



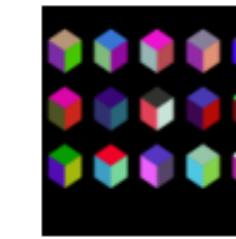
conception2.go



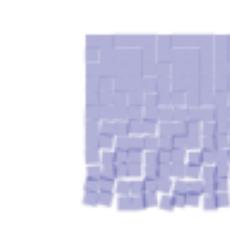
randbox.go



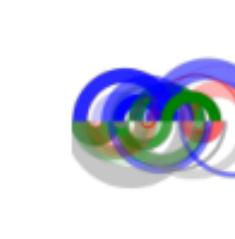
randspot.go



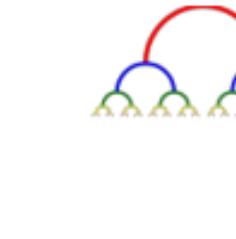
cube.go



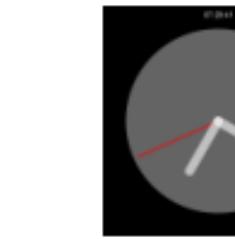
schotter.go



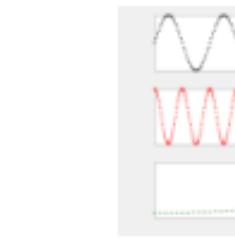
randarc.go



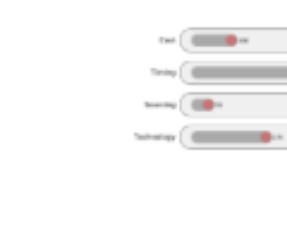
reurse.go



clock.go



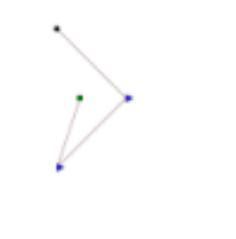
plotfunc.go



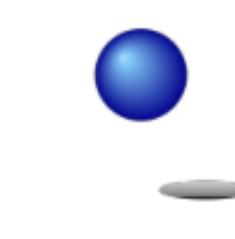
therm.go



pattern.go



marker.go



gradient.go



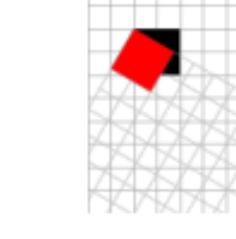
fontrange.go



uni.go



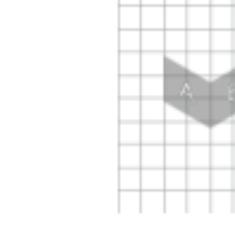
lorem.go



rotate.go



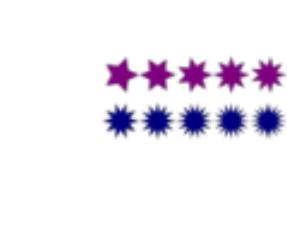
rottext.go



skewabc.go



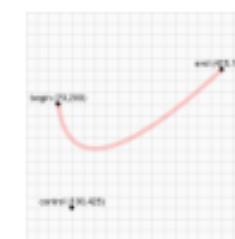
gear.go



star.go



starx.go



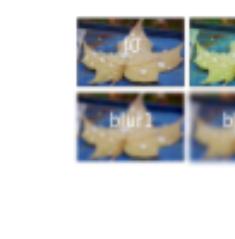
swoosh.go



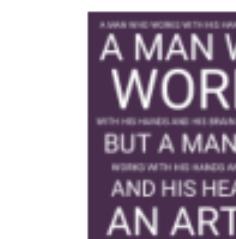
textpath.go



imfade.go



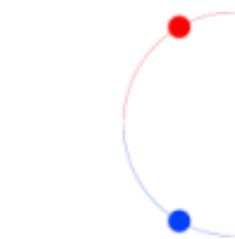
fe.go



artist.go



go.go



am.go

code/svgplay-samples

```

package main

import (
    "fmt"
    "github.com/ajstarks/svg"
    "os"
)

func main() {
    xp := []int{50, 70, 70, 50, 30, 30}
    yp := []int{40, 50, 75, 85, 75, 50}
    xl := []int{0, 0, 50, 100, 100}
    yl := []int{100, 40, 10, 40, 100}
    bgcolor := "rgb(227,78,25)"
    bkcolor := "rgb(153,29,40)"
    stcolor := "rgb(65,52,44)"
    stwidth := 12
    stylefmt := "stroke:%s;stroke-width:%d;fill:%s"
    canvas := svg.New(os.Stdout)
    width, height := 500, 500
    canvas.Start(width, height)
    canvas.Def()
    canvas.Gid("unit")
    canvas.Polyline(xl, yl, "fill:none")
    canvas.Polygon(xp, yp)
    canvas.Gend()
    canvas.Gid("runit")
    canvas.TranslateRotate(150, 180, 180)
    canvas.Use(0, 0, "#unit")
    canvas.Gend()
    canvas.Gend()
    canvas.DefEnd()
    canvas.Rect(0, 0, width, height, "fill:"+bgcolor)
    canvas.Gstyle(fmt.Sprintf(stylefmt, stcolor, stwidth, bkcolor))
    for y := 0; y < height; y += 130 {
        for x := -50; x < width; x += 100 {
            canvas.Use(x, y, "#unit")
            canvas.Use(x, y, "#runit")
        }
    }
    canvas.Gend()
    canvas.End()
}

```



shining.go [8]

```

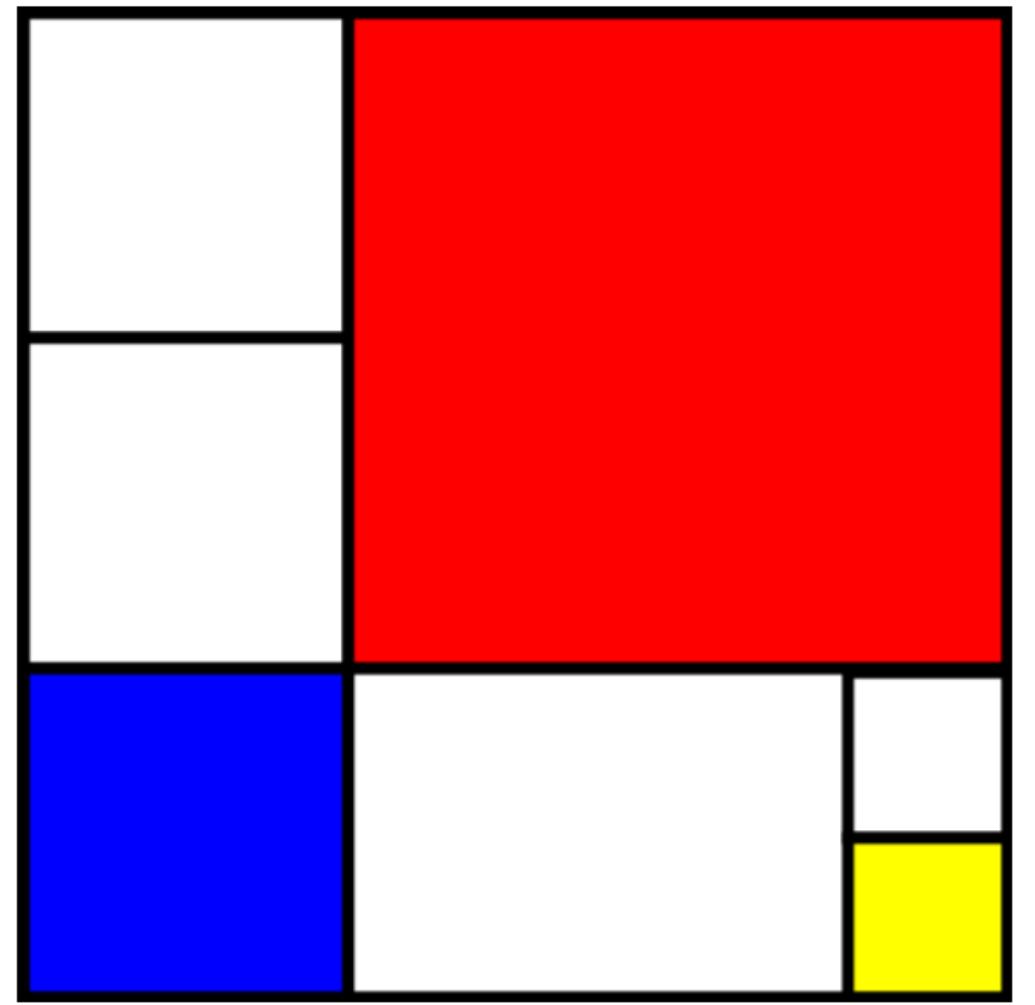
package main

import (
    "os"
    "github.com/ajstarks/svg"
)

var (
    canvas = svg.New(os.Stdout)
    width  = 500
    height = 500
)

// Piet Mondrian - Composition in Red, Blue, and Yellow
func main() {
    w3 := width / 3
    w6 := w3 / 2
    w23 := w3 * 2
    canvas.Start(width, height)
    canvas.Gstyle("stroke:black;stroke-width:6")
    canvas.Rect(0, 0, w3, w3, "fill:white")
    canvas.Rect(0, w3, w3, w3, "fill:white")
    canvas.Rect(0, w23, w3, w3, "fill:blue")
    canvas.Rect(w3, 0, w23, w23, "fill:red")
    canvas.Rect(w3, w23, w23, w3, "fill:white")
    canvas.Rect(width-w6, height-w3, w3-w6, w6, "fill:white")
    canvas.Rect(width-w6, height-w6, w3-w6, w6, "fill:yellow")
    canvas.Gend()
    canvas.Rect(0, 0, width, height, "fill:none;stroke:black;stroke-width:12")
    canvas.End()
}

```



mondrian.go [9]

```

package main

import (
    "github.com/ajstarks/svg"
    "os"
)

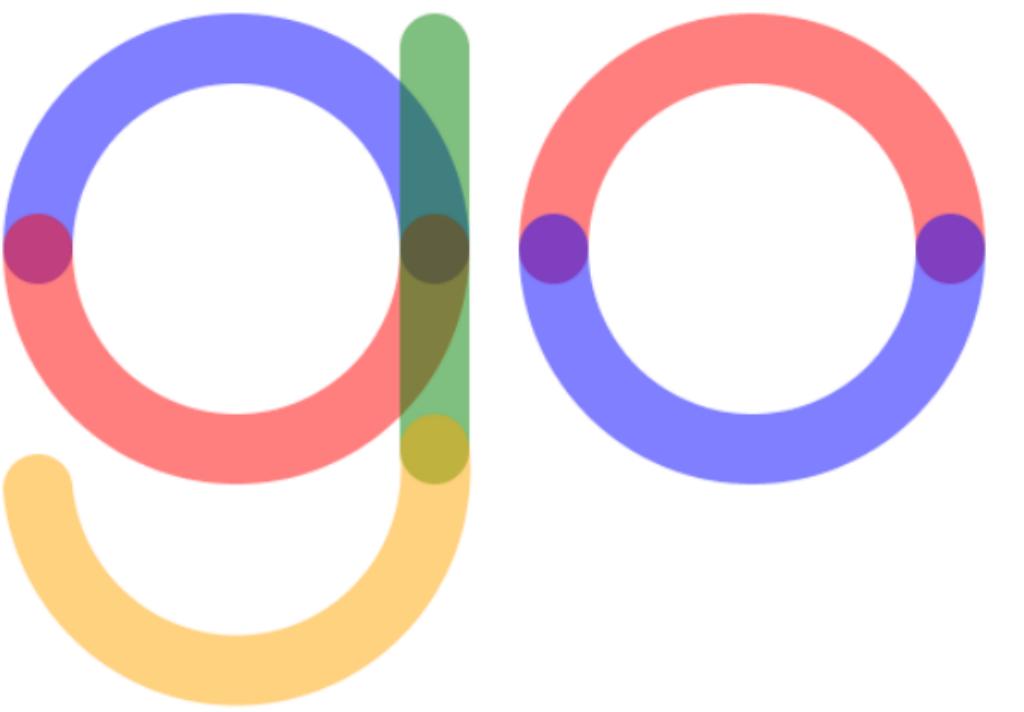
var (
    canvas = svg.New(os.Stdout)
    width  = 500
    height = 500
)

func main() {
    blues := "stroke:blue"
    reds := "stroke:red"
    greens := "stroke:green"
    organges := "stroke:orange"

    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height, "fill:white")

    canvas.Gstyle("fill:none;stroke-opacity:0.5;stroke-width:35;stroke-linecap:round")
    // g
    canvas.Arc(20, 200, 30, 30, 0, false, true, 220, 200, blues)
    canvas.Arc(20, 200, 30, 30, 0, false, false, 220, 200, reds)
    canvas.Line(220, 100, 220, 300, greens)
    canvas.Arc(20, 320, 30, 30, 0, false, false, 220, 300, organges)
    // o
    canvas.Arc(280, 200, 30, 30, 0, false, true, 480, 200, reds)
    canvas.Arc(280, 200, 30, 30, 0, false, false, 480, 200, blues)
    canvas.Gend()
    canvas.End()
}

```



go.go [47]

```

package main

import (
    "github.com/ajstarks/svg"
    "os"
)

var (
    canvas = svg.New(os.Stdout)
    width  = 500
    height = 500
)

func main() {
    angle, cx, cy := 30.0, width/2, height/2
    r := width / 4
    p := r / 8

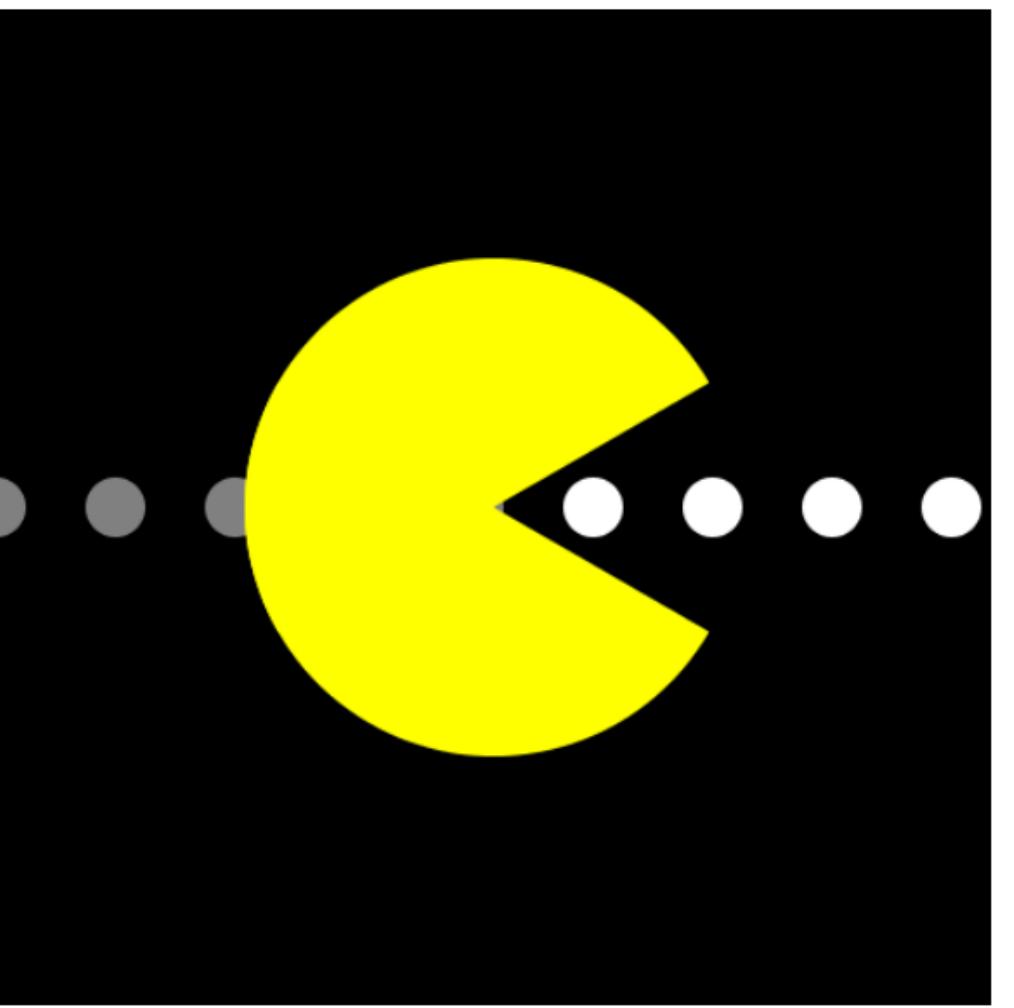
    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height)
    canvas.Gstyle("fill:white")
    for x := 0; x < 100; x += 12 {
        if x < 50 {
            canvas.Circle((width*x)/100, cy, p, "fill-opacity:0.5")
        } else {
            canvas.Circle((width*x)/100, cy, p, "fill-opacity:1")
        }
    }
    canvas.Gend()

    canvas.Gstyle("fill:yellow")
    canvas.TranslateRotate(cx, cy, -angle)
    canvas.Arc(-r, 0, r, r, 30, false, true, r, 0)
    canvas.Gend()

    canvas.TranslateRotate(cx, cy, angle)
    canvas.Arc(-r, 0, r, r, 30, false, false, r, 0)
    canvas.Gend()

    canvas.Gend()
    canvas.End()
}

```



pacman.go [12]

Read/Parse/Draw Pattern

Read

Parse

Draw

from the data source into data structures from the structures

Data



Picture

Read

<https://api.nytimes.com/svc/topstories/v2/food.json?api-key=...>

```
{  
  "status": "OK",  
  "copyright": "Copyright (c) 2019 The New York Times Company. All Rights Reserved.",  
  "section": "food",  
  "last_updated": "2019-06-26T07:57:20-04:00",  
  "num_results": 26,  
  "results": [  
    {  
      "section": "Food",  
      "subsection": "",  
      "title": "Thomas Keller Brings Country Club Cuisine to the City",  
      "abstract": "At TAK Room at Hudson Yards, the chef salutes the strait-laced, spice-free food that rich Americans used to feed on.",  
      "url": "https://www.nytimes.com/2019/06/25/dining/tak-room-review-thomas-keller.html",  
      "byline": "By PETE WELLS",  
      "item_type": "Article",  
      "updated_date": "2019-06-25T11:59:42-04:00",  
      "created_date": "2019-06-25T11:59:42-04:00",  
      "published_date": "2019-06-25T11:59:42-04:00",  
      "material_type_facet": "",  
      "kicker": "",  
      "des_facet": [  
        "Restaurants"  
      ],  
      "org_facet": [  
        "TAK Room (Manhattan, NY, restaurant)"  
      ],  
      "per_facet": [  
        "Keller, Thomas"  
      ],  
      "geo_facet": [  
        "Hudson Yards (Manhattan, NY)"  
      ],  
      "multimedia": [  
        {  
          "url": "https://static01.nyt.com/images/2019/06/26/dining/25REST-slide-H6ZN/25REST-slide-H6ZN-thumbStandard.jpg",  
          "format": "Standard Thumbnail",  
          "height": 75,  
          "width": 75,  
          "type": "image",  
          "subtype": "photo",  
          "caption": "",  
          "copyright": "Jeenah Moon for The New York Times"  
        },  
        {  
          "url": "https://static01.nyt.com/images/2019/06/26/dining/25REST-slide-H6ZN/25REST-slide-H6ZN-thumbLarge.jpg",  
          "format": "thumbLarge",  
          "height": 150  
        }  
      ]  
    }  
  ]  
}
```

Parse

Draw



Imports

```
package main

import (
    "encoding/json"
    "flag"
    "fmt"
    "io"
    "net/http"
    "os"
    "time"

    "github.com/ajstarks/svg"
)
```

Constants

```
// API Info and formats
const (
    NYTAPIkey = "HxTV50RYD7LyGzHxUy7XCThV3kQ3HYvk"
    NYTfmt    = "https://api.nytimes.com/svc/topstories/v2/%s.json?api-key=%s"
    style     = "font-size:9pt;font-family:sans-serif;text-anchor:middle;fill:white"
    errfmt    = "unable to get network data for %s (%s)"
    headfmt   = "New York Times Top Stories for %s"
    datefmt   = "Monday Jan 2, 2006"
    usage     = `section choices:
arts, automobiles, books, business, fashion,
food, health, home, insider, magazine, movies,
national, nyregion, obituaries, opinion, politics,
realestate, science, sports, sundayreview, technology,
theater, tmagazine, travel, upshot, world`  
)
```

Data Structures

```
// NYTStories is the headline info from the New York Times
type NYTStories struct {
    StoryCount int      `json:"num_results"`
    Results     []result `json:"results"`
}

type result struct {
    Title      string   `json:"title"`
    URL        string   `json:"url"`
    Multimedia []multimedia `json:"multimedia"`
}

type multimedia struct {
    URL      string `json:"url"`
    Width    int    `json:"width"`
    Height   int    `json:"height"`
    Format   string `json:"format"`
}
```

Main

```
func main() {
    var section = flag.String("s", "home", usage)
    var nstories = flag.Int("n", 25, "number of stories")
    flag.Parse()

    width, height := 1000, (*nstories/5)*150
    canvas := svg.New(os.Stdout)
    canvas.Start(width, height)
    canvas.Rect(0, 0, width, height)
    nytStories(canvas, width, *section, *nstories)
    canvas.End()
}
```

Network

```
// netread dereferences a URL, returning the Reader, with an error
func netread(url string) (io.ReadCloser, error) {
    client := &http.Client{Timeout: 30 * time.Second}
    resp, err := client.Get(url)
    if err != nil {
        return nil, err
    }
    if resp.StatusCode != http.StatusOK {
        return nil, fmt.Errorf(errfmt, url, resp.Status)
    }
    return resp.Body, nil
}
```

Read and Decode

```
// nytStories retrieves Top Stories data
// from the New York Times API, decodes and displays it.
func nytStories(canvas *svg.SVG, width int, section string, n int) {
    r, err := netread(fmt.Sprintf(NYTfmt, section, NYTAPIkey))
    if err != nil {
        fmt.Fprintf(os.Stderr, "headline read error: %v\n", err)
        return
    }
    defer r.Close()
    var data NYTStories
    if err = json.NewDecoder(r).Decode(&data); err != nil {
        fmt.Fprintf(os.Stderr, "decode: %v\n", err)
        return
    }
    drawStories(canvas, width, data, n)
}
```

Drawing (setup)

```
// drawStories walks the result structure,  
// displaying title and thumbnail in a grid  
func drawStories(canvas *svg.SVG, width int, data NYTStories, n int) {  
    top, left := 100, 150  
    titley := top - 50  
    x, y := left, top  
    ts := fmt.Sprintf(headfmt, time.Now().Format(datefmt))  
    if n > data.StoryCount {  
        n = data.StoryCount  
    }
```

Drawing

```
canvas.Gstyle(style)
canvas.Text(width/2, titley, ts, "font-size:300%")
for i := 0; i < n; i++ {
    d := data.Results[i]
    tw, th, imagelink := imageinfo(d)
    if i > 0 && i%5 == 0 {
        x = left
        y += th + (th / 2)
    }
    canvas.Link(d.URL, d.Title)
    canvas.Image(x, y, tw, th, imagelink)
    canvas.Text(x+tw/2, y+th+12, struncate(d.Title, 20))
    canvas.LinkEnd()
    x += tw * 2
}
canvas.Gend()
```

Helpers

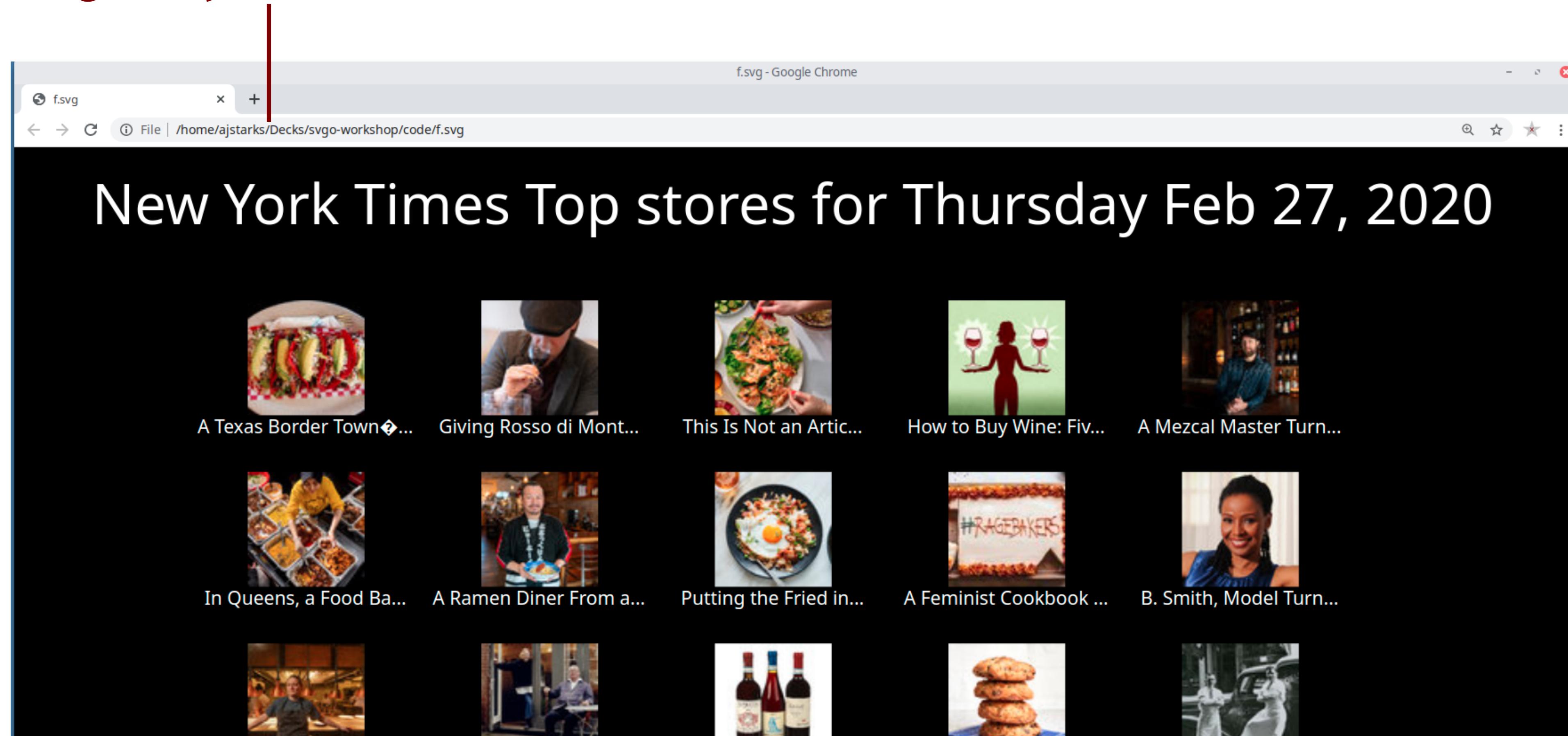
```
// struncate truncates a string with ellipsis
func struncate(s string, n int) string {
    if len(s) <= n {
        return s
    }
    return s[0:n] + "..."
}

// imageinfo returns the thumbnail image information
func imageinfo(data result) (int, int, string) {
    for _, m := range data.Multimedia {
        if m.Format == "Standard Thumbnail" {
            return m.Width, m.Height, m.URL
        }
    }
    return 75, 75, ""
}
```

Running nytsvg

```
$ git clone https://github.com/ajstarks/svgo-workshop  
$ cd svgo-workshop/code  
$ go run nytsvg.go -s food > f.svg
```

Open **f.svg** in your browser





Thank You

<https://github.com/ajstarks/svgo-workshop>

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