

数据可视化

Week 9

Draw an SVG shape and installing d3

虞思逸

环境

- **本地：** VSCode
- **Live Server/Preview on web server**
- **在线：** <https://observablehq.com/@d3/learn-d3>
- **D3下载：** <https://d3js.org/>
- **在线引用：** <https://d3js.org/d3.v7.min.js>

SVG

- Scalable Vector Graphics, 可缩放矢量图形
- Adobe Illustrator等矢量绘图软件可以生成SVG



SVG

- **SVG 可被非常多的工具读取和修改（比如记事本）**
- **SVG 与 JPEG 和 GIF 图像比起来，尺寸更小，且可压缩性更强。**
- **SVG 是可伸缩的，可在图像质量不下降的情况下被放大，可在任何的分辨率下被高质量地打印**
- **SVG 图像中的文本是可选的，同时也是可搜索的（很适合制作地图）**

SVG vs. canvas

- SVG (Scalable Vector Graphics)
- XML syntax
- each shape is a DOM element
- **pro:** easy to get started and interact with
- **con:** not performant at large scale
- HTML5 Canvas
- Javascript API
- One Canvas element, shapes are inaccessible once drawn
- **pro:** very performant, especially for animations
- **con:** hard to interact with

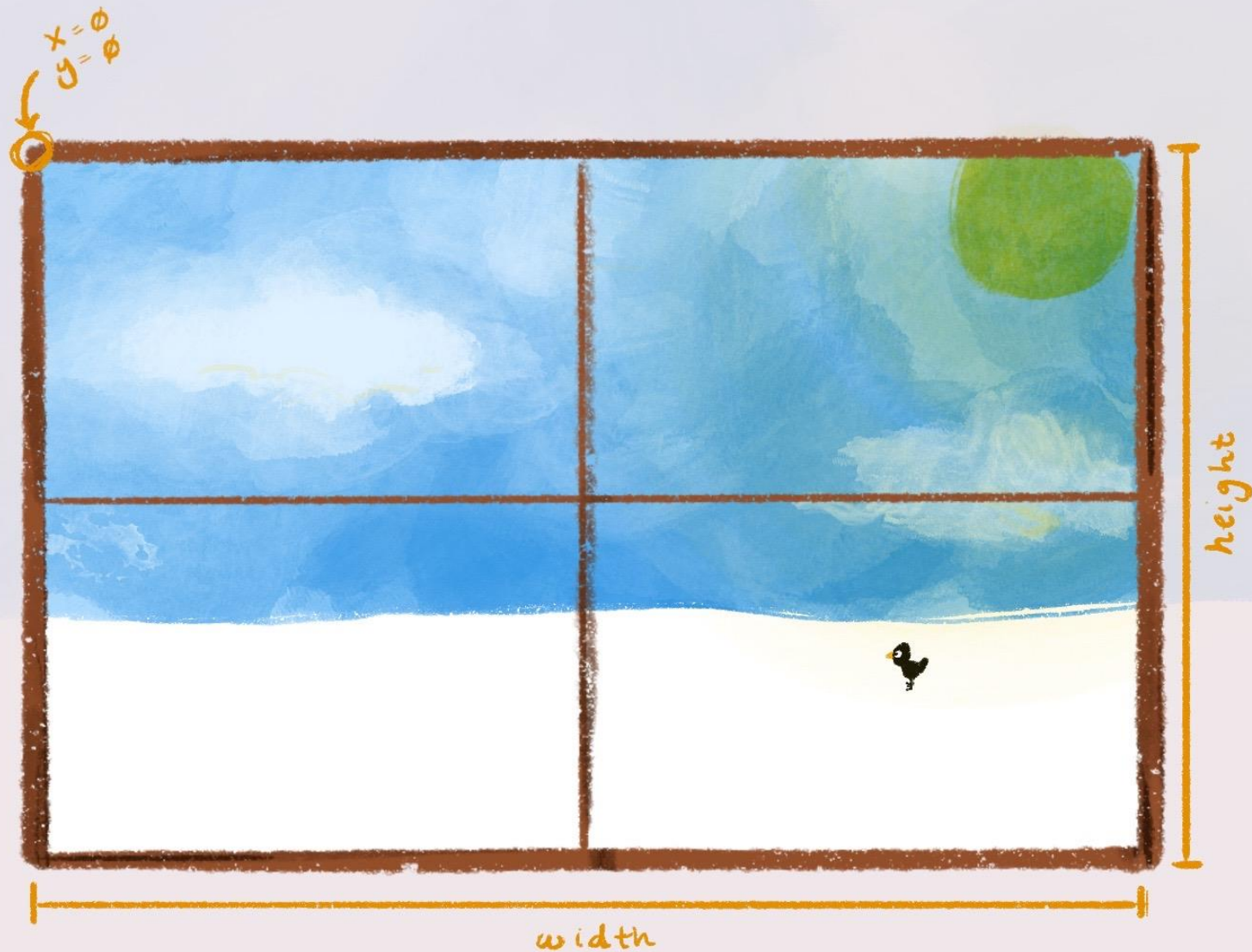
"SVG is like Illustrator and Canvas is like Photoshop."

SVG坐标系统

```
<svg width=800 height=600>
```

```
<-- a whole world -->
```

```
</svg>
```

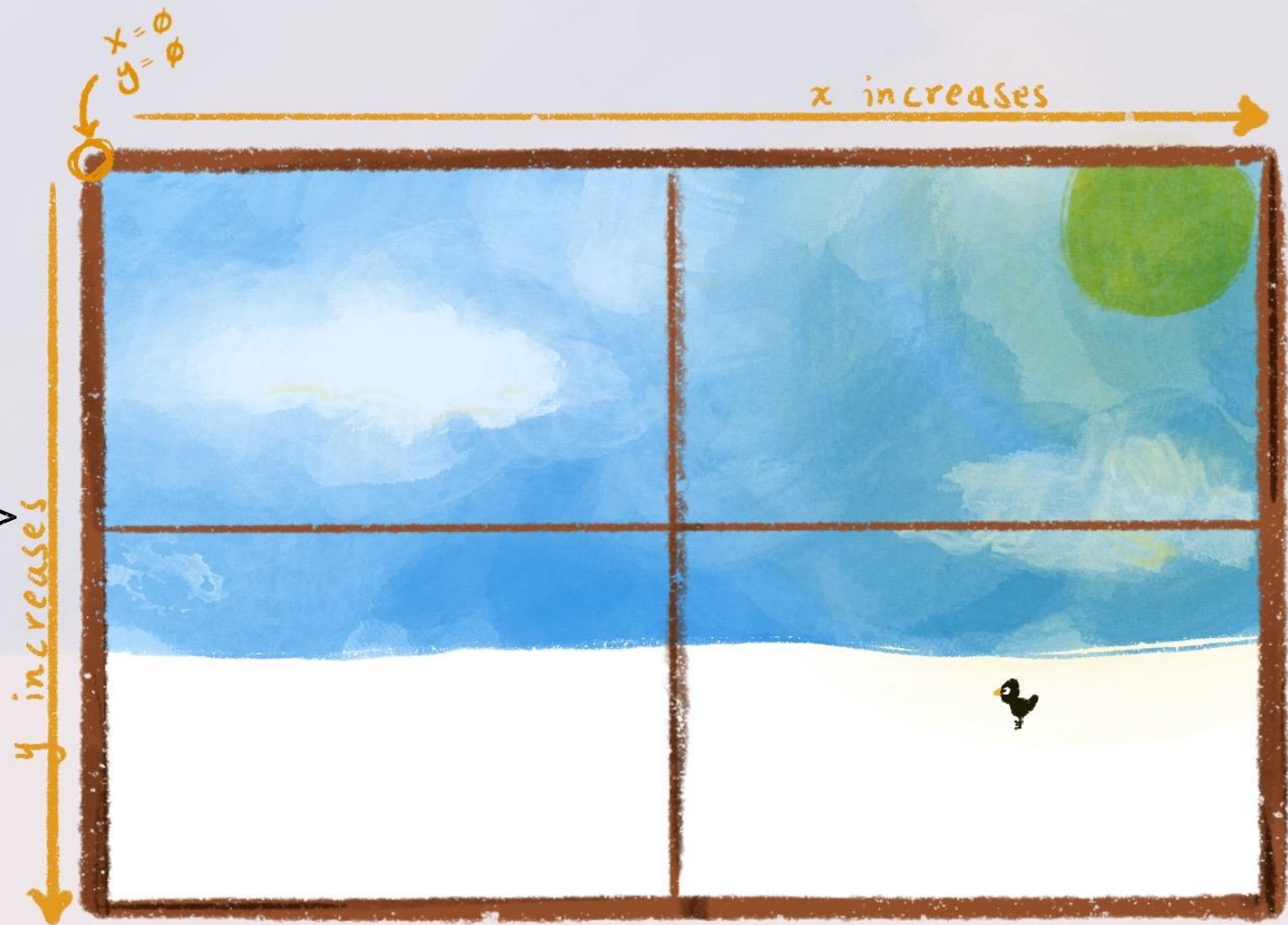





SVG坐标系统




```
<svg width=800 height=600>
```

```
<-- a whole world -->
```

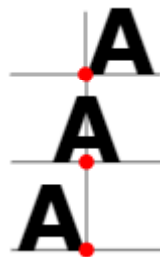
```
</svg>
```



tag	example	attributes	optional attributes
<code><rect></code>		width, height	x, y
<code><circle></code>		r	cx, cy
<code><path></code>		<code>[d]</code> A list of points and other information about how to draw the path.	
<code><text></code>	hi there!		x, y, text-anchor, dy

tag	example	attributes	optional attributes
<rect>		width, height	x, y
<circle>		r	cx, cy
<path>		d	
<text>	hi there!		x, y, text-anchor, dy

y指基线位置 text-anchor指对齐方式 (start | middle | end)




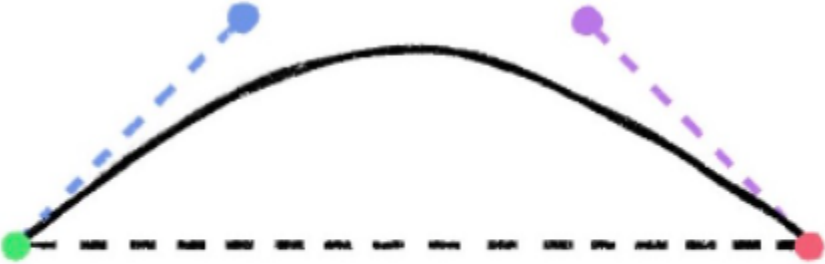
d='M0,0 C50,40 50,70 20,100 L0,85 L-20,100 C-50,70 -50,40 0,0'

An example of flower petal!



```
<h2>An example of flower petal!</h2>

<svg width=100 height=100 style='overflow: visible; margin: 5px;'>
  <path d='M0,0 C50,40 50,70 20,100 L0,85 L-20,100 C-50,70 -50,40 0,0' fill='#ffb3bf' stroke='#ffecf1'
    stroke-width=2 transform='translate(50,0) scale(0.5 0.5)' />
</svg>
```

command	syntax	(how I think about them)
Move To	M x,y	<i>Pick the pen off the paper, put it back down at x,y.</i>
Line To	L x,y	 M x,y L x,y
Curve To (Cubic Bézier)	C x,y x,y x,y	 M x,y C x,y x,y x,y

d=‘

M0,0 **C**50,40 50,70 20,100

L0,85

L-20,100

C-50,70 -50,40 0,0

,

①



M0,0 C50,40 50,70 20,100

②



M0,0 C50,40 50,70 20,100

L0,85

③

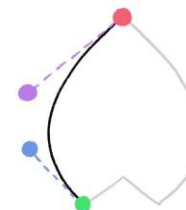


M0,0 C50,40 50,70 20,100

L0,85

L-20,100

④



M0,0 C50,40 50,70 20,100

L0,85

L-20,100

C-50,70 -50,40 0,0

SVG

属性

- fill
- stroke
- stroke-width
- opacity
- font-family
- font-size

transform:

- translate
- rotate
- scale
- skew

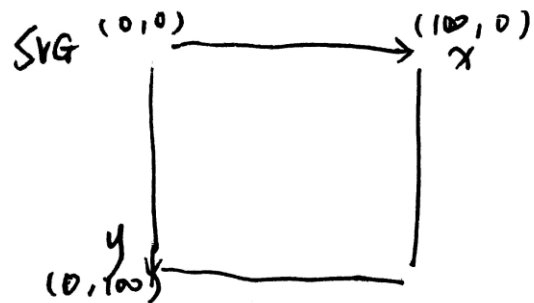
分层与绘制顺序

- 类似于在画布上作画
- 前后顺序很重要

透明度的设置

- rgba
- opacity

① About coordinate.



练习：绘制心形

• 课后练习：绘制一个你的专属花瓣吧！

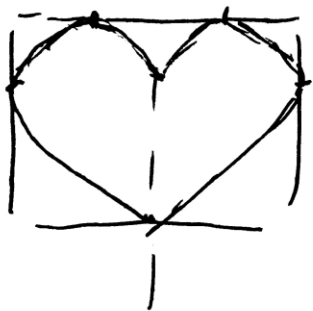
• 请在超星平台上传↓

①设计手稿的照片or截图

②html文件

③生成花瓣的截图

②. Heart .



③ 考虑到精准对称

