

Adding Graphics to Web Pages Using Canvas and SVG

USING SVG TO CREATE IMAGES



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Uses for SVG and Canvas



Charts

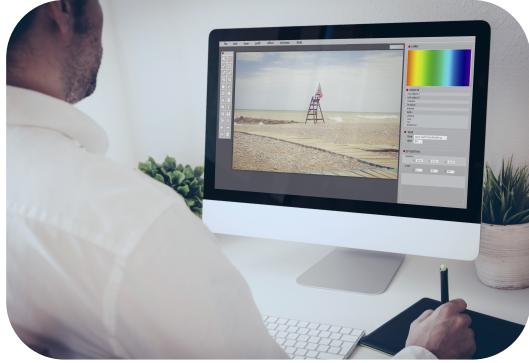
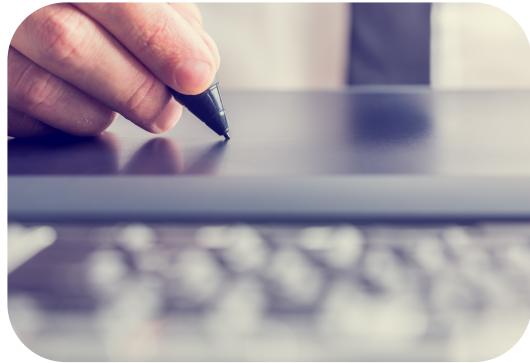


Image
editing



Sketching



Games



Course Overview

**Scalable Vector Graphics
(SVG)**

Canvas



Course Overview

SVG	Canvas
Basic shapes	Basic shapes
Paths	Paths
Text	Text
Images	Images
Gradients	Gradients
Animation	Sketching

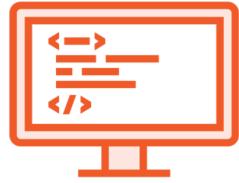


Course Overview

SVG	Canvas
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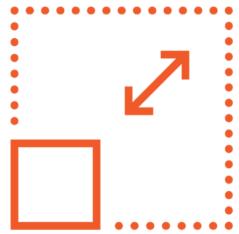
What are Scalable Vector Graphics (SVG)



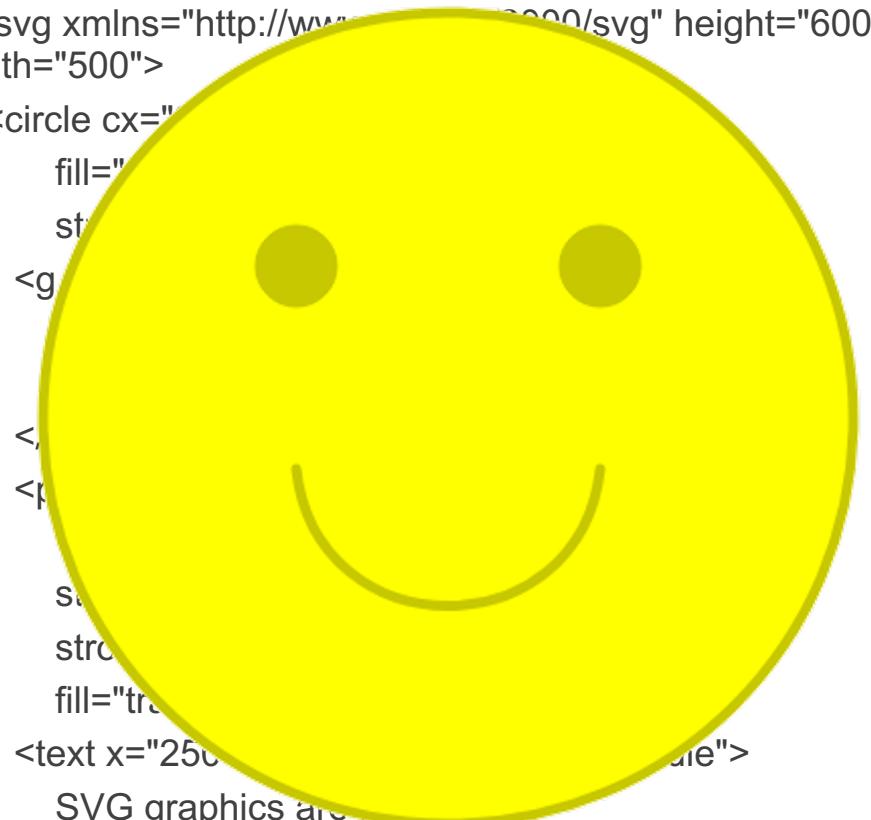
XML-based language, similar to HTML



Integrates well with HTML and CSS



Consistent quality, regardless of rendered size



The image shows a large yellow circular smiley face graphic. Inside the circle are two small green dots for eyes and a curved green line for a smile. To the left of the graphic, there is a block of XML code. Below the graphic, the text "SVG graphics are fun!" is displayed.

```
<svg xmlns="http://www.w3.org/2000/svg" height="600" width="500">
  <circle cx="500" cy="500" r="450" fill="yellow" stroke="black" stroke-width="2px"/>
  <g>
    <circle cx="500" cy="500" r="100" fill="white" stroke="black" stroke-width="2px"/>
    <circle cx="500" cy="500" r="50" fill="green" stroke="black" stroke-width="2px"/>
    <polyline points="500,450 450,550 550,550" fill="none" stroke="black" stroke-width="2px"/>
  </g>
</svg>
```

SVG graphics are fun!



First Steps with SVG

```
<svg xmlns="http://www.w3.org/2000/svg"  
height="100"  
width="100">  
  
</svg>
```



First Steps with SVG

```
<svg xmlns="http://www.w3.org/2000/svg"
```

```
height="100"
```

```
width="100">
```

```
</svg>
```

SVG tag wraps entire image



First Steps with SVG

```
<svg xmlns="http://www.w3.org/2000/svg"
```

```
height="100"
```

```
width="100">
```

```
</svg>
```

SVG tag wraps entire image

XML namespace to define vocabulary



First Steps with SVG

```
<svg xmlns="http://www.w3.org/2000/svg"
```

```
    height="100"
```

```
    width="100">
```

```
</svg>
```

SVG tag wraps entire image

XML namespace to define vocabulary

Set height and width of document*



Drawing Basic Shapes



```
<svg height="200" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<rect  
      x="10" y="10"  
      width="50" height="50"  
      stroke="black" stroke-width="5"  
      fill="rgb(240,90,40)"  
/>  
  
</svg>
```

◀ Outer SVG tag

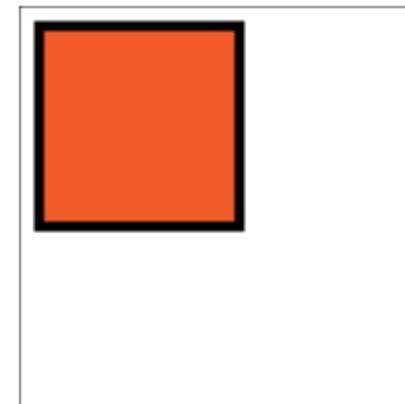
◀ Rectangle

◀ Position of upper, left corner of shape

◀ Size of rectangle

◀ Color and thickness of outline

◀ Color of shape's body



Basic Shapes

```
<rect width="100" height="100" />
```

```
<rect width="100" height="100" rx="10" ry="10" />
```



```
<circle cx="50" cy="50" r="20" />
```

```
<ellipse cx="50" cy="50" rx="50" ry="20" />
```



```
<line x1="25" y1="25" x2="50" y2="50" />
```

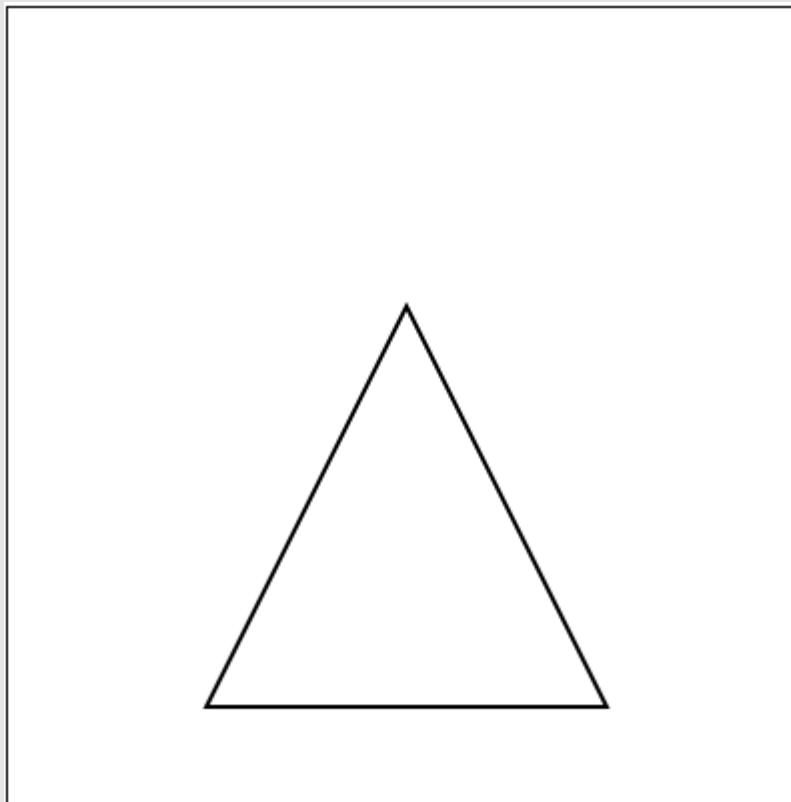
```
<polyline points="100,75 150,175 50,175" />
```

```
<polygon points="100 75 150 175 50 175" />
```



Drawing with Path Elements

```
<path  
    d="M 100, 75  
      l 50, 100  
      h -100  
      z"  
/>
```



Drawing with Path Elements

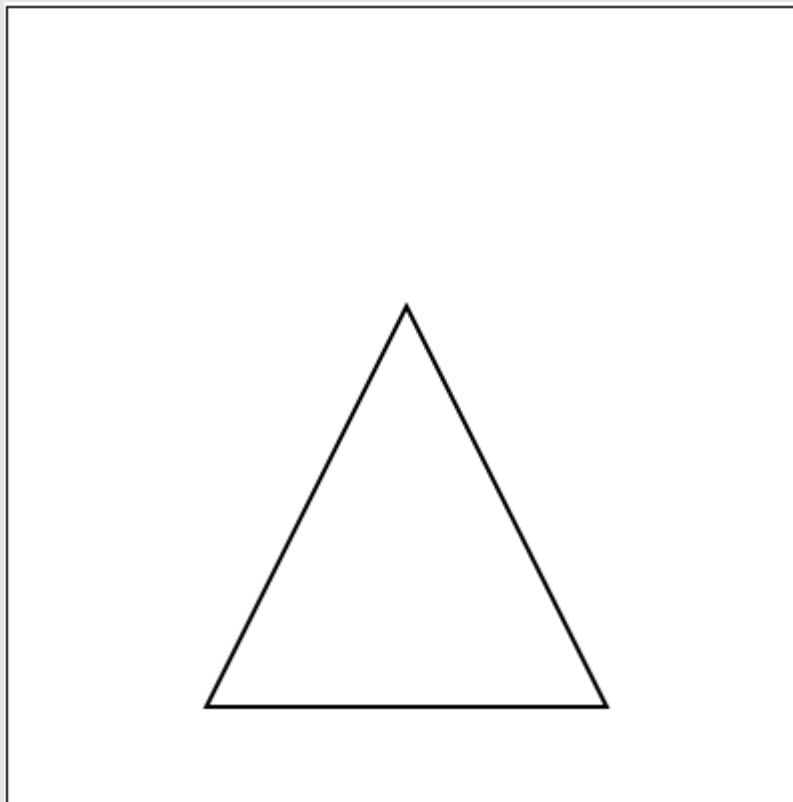
<path

d="M 100, 75

l 50, 100

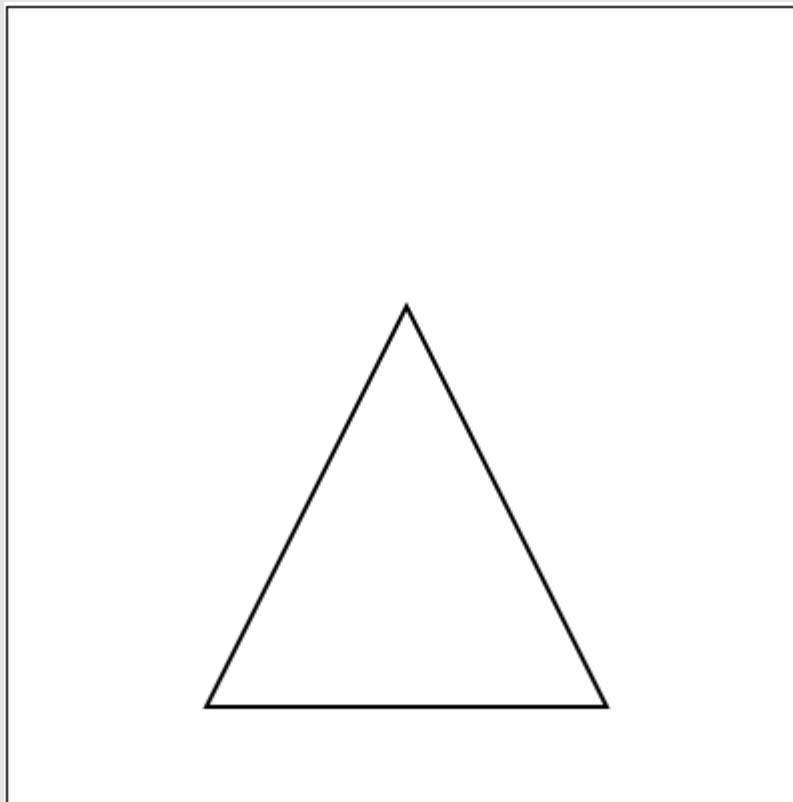
h -100

z"

/>

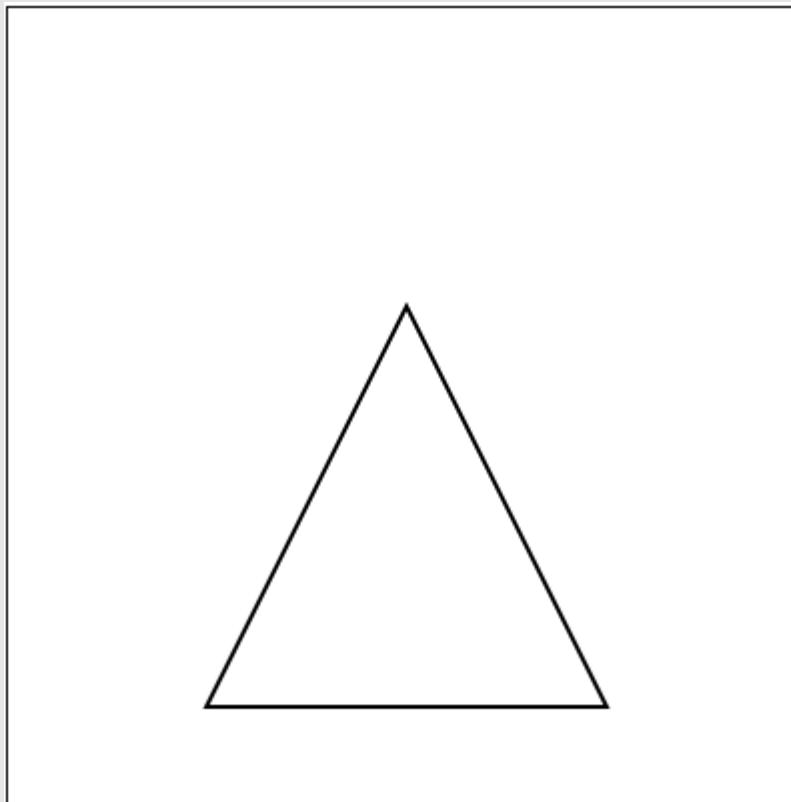
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<path  
    d="M 100, 75  
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      h -100  
      z"  
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      l 50, 100  
      h -100  
      z"  
/>
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Drawing with Path Elements

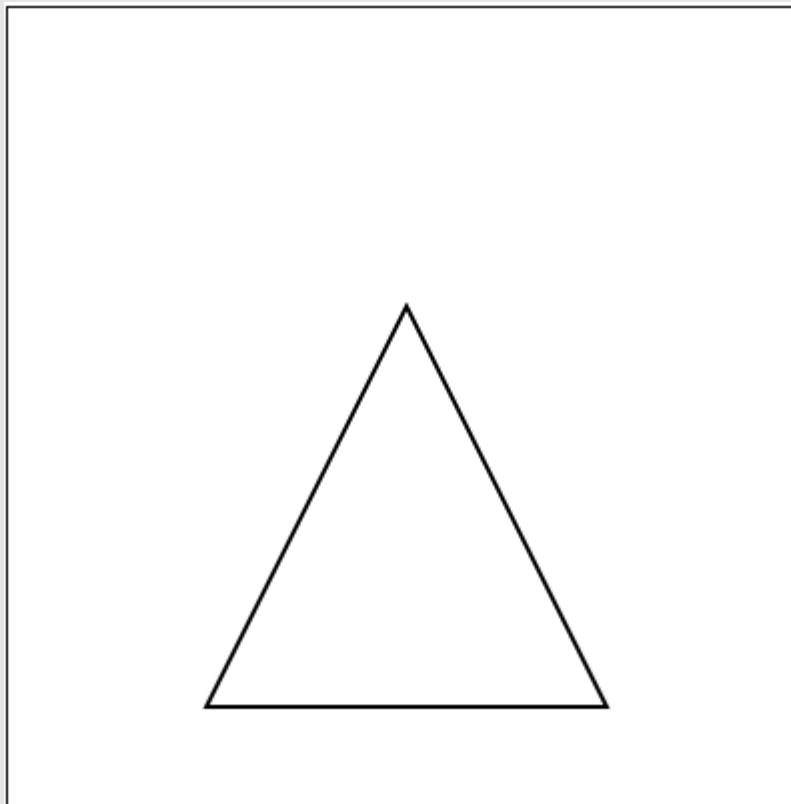
```
<path
```

```
    d="M 100, 75
```

```
    l 50, 100
```

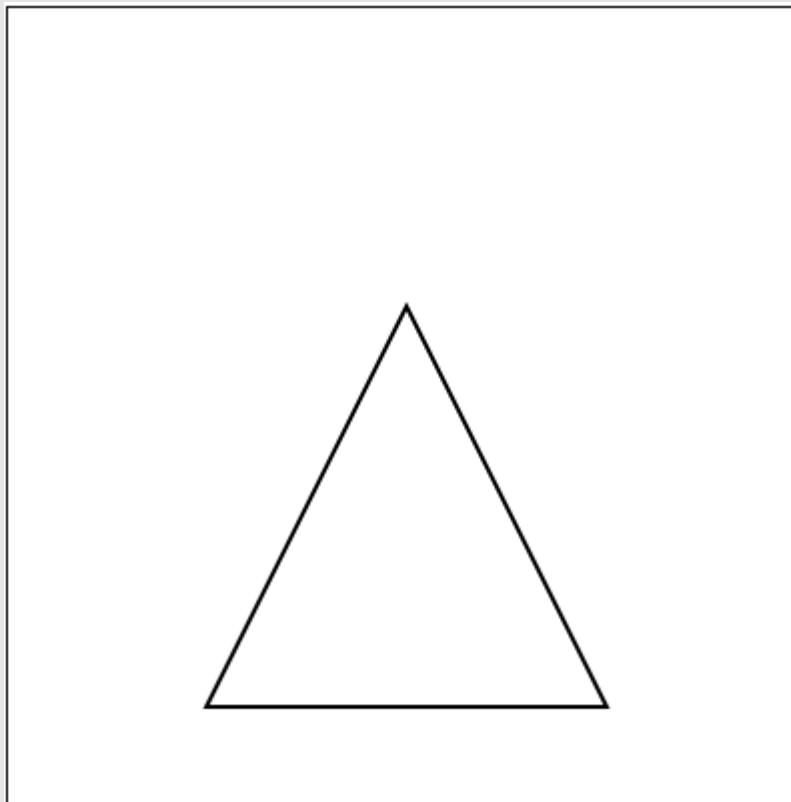
```
    h -100
```

```
    z"
```

/>

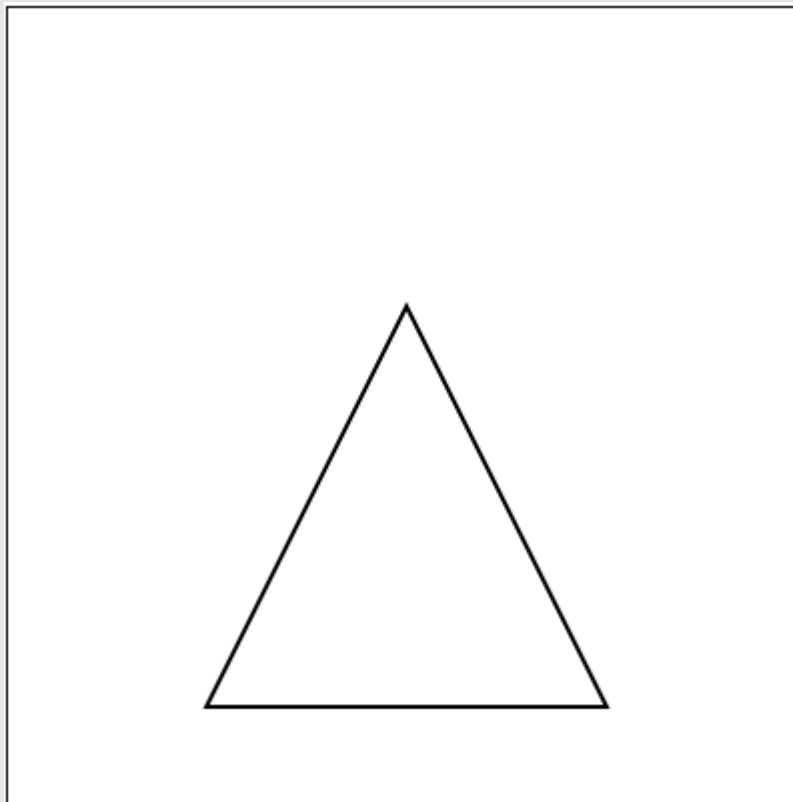
Drawing with Path Elements

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<path  
    d="M 100, 75  
      l 50, 100  
      h -100  
      z"  
/>
```



Drawing with Path Elements

```
<path  
    d="M 100, 75  
      l 50, 100  
      h -100  
      z"  
/>
```

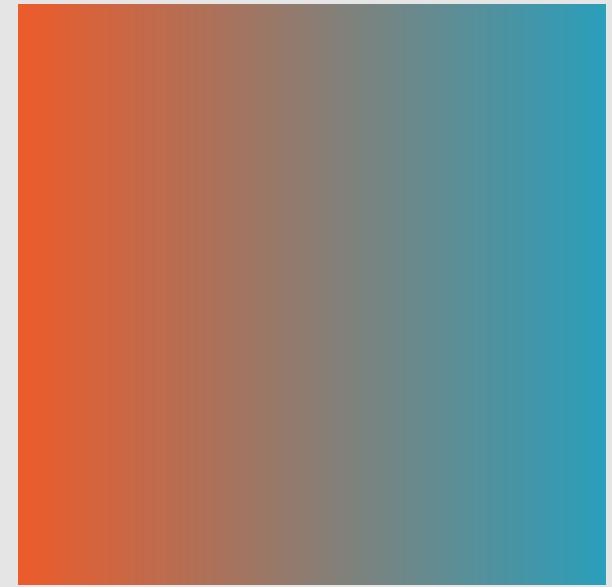


M or m	◀ Move absolute or relative
L or l	◀ Line
H or h	◀ Horizontal line
V or v	◀ Vertical line
C or c	◀ Bezier curve
S or s	◀ Smooth adjacent Bezier curves
Q or q	◀ Quadratic curve
T or t	◀ Smooth adjacent quadratic curves
A or a	◀ Arc
Z or z	◀ Close curve



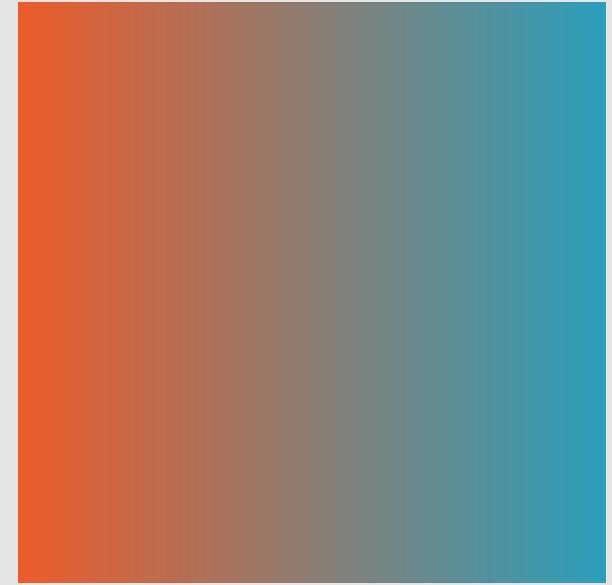
Gradients

```
<svg height="500" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<defs>  
  
  <linearGradient id="gradient1">  
    <stop offset="0%" stop-color="rgb(240, 90, 40)"/>  
    <stop offset="100%" stop-color="rgb(42, 159, 188)" />  
  </linearGradient>  
  
</defs>  
  
<rect x="10" y="10" width="180" height="180" fill="url(#gradient1)"/>  
  
</svg>
```



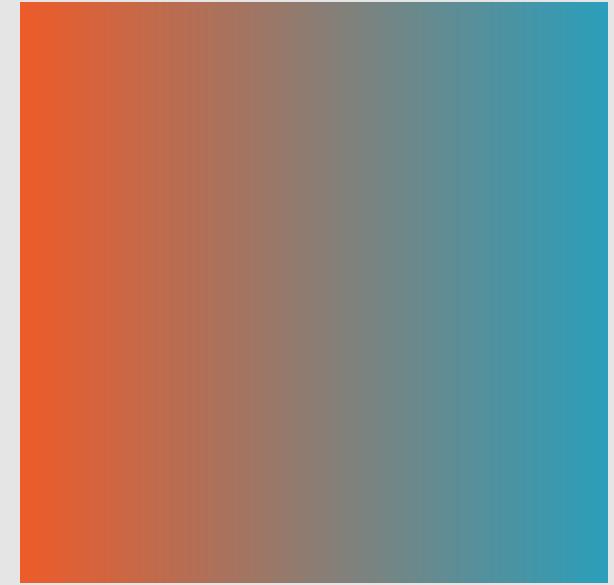
Gradients

```
<svg height="500" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<defs>  
  
  <linearGradient id="gradient1">  
    <stop offset="0%" stop-color="rgb(240, 90, 40)"/>  
    <stop offset="100%" stop-color="rgb(42, 159, 188)" />  
  </linearGradient>  
  
</defs>  
  
<rect x="10" y="10" width="180" height="180" fill="url(#gradient1)"/>  
  
</svg>
```



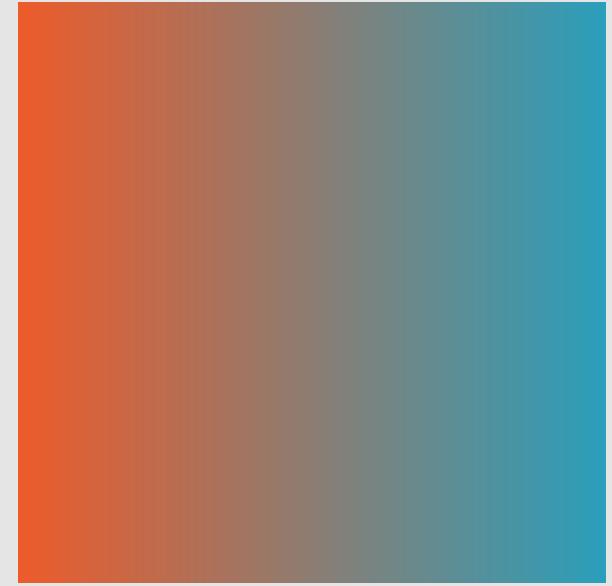
Gradients

```
<svg height="500" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<defs>  
  
  <linearGradient id="gradient1">  
    <stop offset="0%" stop-color="rgb(240, 90, 40)"/>  
    <stop offset="100%" stop-color="rgb(42, 159, 188)" />  
  </linearGradient>  
  
</defs>  
  
<rect x="10" y="10" width="180" height="180" fill="url(#gradient1)"/>  
  
</svg>
```



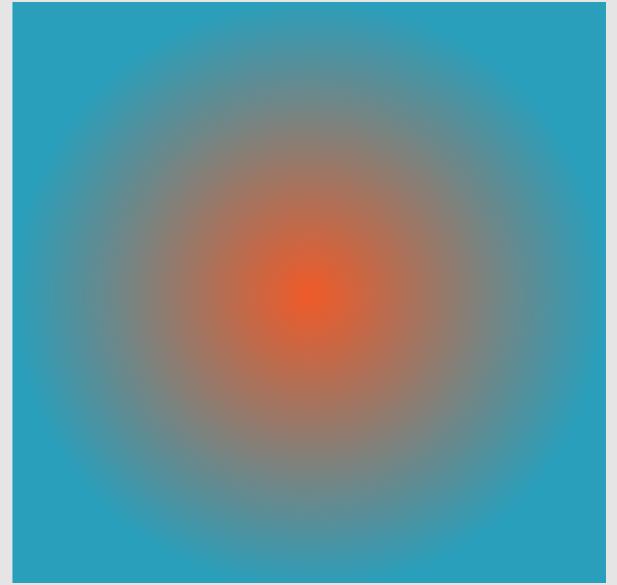
Gradients

```
<svg height="500" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<defs>  
  
  <linearGradient id="gradient1">  
    <stop offset="0%" stop-color="rgb(240, 90, 40)"/>  
    <stop offset="100%" stop-color="rgb(42, 159, 188)" />  
  </linearGradient>  
  
</defs>  
  
<rect x="10" y="10" width="180" height="180" fill="url(#gradient1)"/>  
  
</svg>
```



Gradients

```
<svg height="500" width="200"  
      xmlns="http://www.w3.org/2000/svg">  
  
<defs>  
  
  <radialGradient id="gradient2">  
    <stop offset="0%" stop-color="rgb(240, 90, 40)"/>  
    <stop offset="100%" stop-color="rgb(42, 159, 188)" />  
  </radialGradient>  
  
</defs>  
  
<rect x="10" y="10" width="180" height="180" fill="url(#gradient2)"/>  
  
</svg>
```



Summary



What are Scalable Vector Graphics (SVG)?

Rendering different types of content

- Basic shapes
- Paths
- Text
- Images

Animating SVGs

<https://developer.mozilla.org/en-US/docs/Web/SVG>

