WebTech (6)

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Inhalt

Was is SVG ?

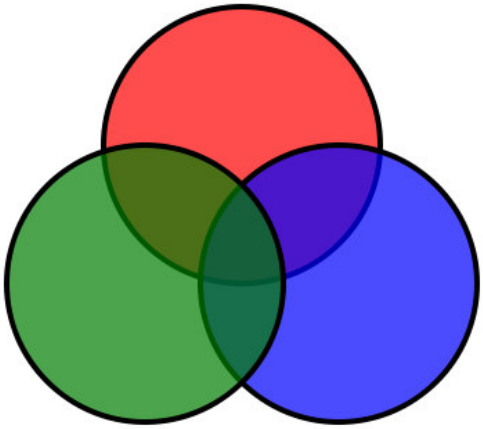
SVG ist ...

- eine XML-basierte Auszeichnungssprache zur Beschreibung zweidimensionaler Vektorgrafiken.
- ein offener Webstandard des W3C.
- wahlweise
  - statisch
  - animiert
  - interaktiv

SVG Beispiel

[berühmter Tiger, Quelle(Mozilla)]

SVG Beispiel (2)



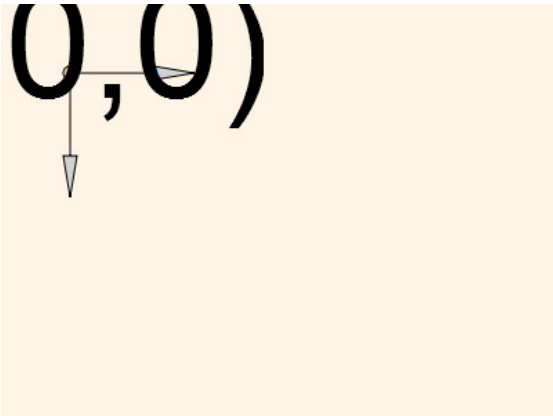
Quellcode

```
<?xml version="1.0"?>
<svg xmlns="http://www.w3.org/2000/svg">
  <style type="text/css">
    circle:hover {fill-opacity:0.9;}
  </style>
  <g style="fill-opacity:0.7;" stroke="black" stroke-width="4">
    <circle cx="250" cy="120" r="100" fill="red" />
    <circle cx="320" cy="220" r="100" fill="blue" />
    <circle cx="180" cy="220" r="100" fill="green" />
  </g>
</svg>
```

SVG Grundgerüst

```
<?xml version="1.0"?>
<svg xmlns="http://www.w3.org/2000/svg"
     xmlns:xlink="http://www.w3.org/1999/xlink"
     width="[breite]" height="[höhe]">
  <title>Titeltext</title>
  <desc>Textuelle Bildbeschreibung (optional)</desc>
  <defs>Stylesheets, Definitionen, Skripte</defs>
  <!-- Grafische Elemente -->
</svg>
```

SVG Koordinatensystem



- Das SVG Koordinatensystem ist ein linkshändiges System, bei dem die y-Achse nach "unten" weist.
- Der Grafikbereich *(canvas)* ist unbegrenzt.
- *Breite* und *Höhe* des Ausgabefensters *(viewport)* werden im `svg` Wurzelelement spezifiziert.
- Alternativ zu Höhen- und Breitenangabe kann ein Ausgabefenster mittels einer `viewbox` definiert werden.

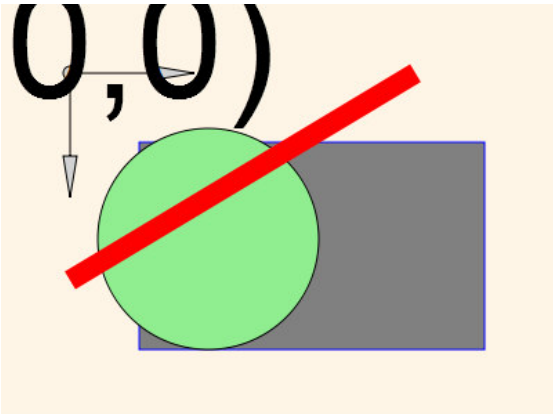
Ausgabefenster mittels Höhe und Breite

```
<svg xmlns="http://www.w3.org/2000/svg"
     xmlns:xlink="http://www.w3.org/1999/xlink"
     width="[breite]" height="[höhe]">
```

Ausgabefenster mittels `viewbox`

```
<svg xmlns="http://www.w3.org/2000/svg"
     xmlns:xlink="http://www.w3.org/1999/xlink"
     viewbox="[xmin ymin width height]">
```

Grafikaufbau ... Painters Model



Quellcode

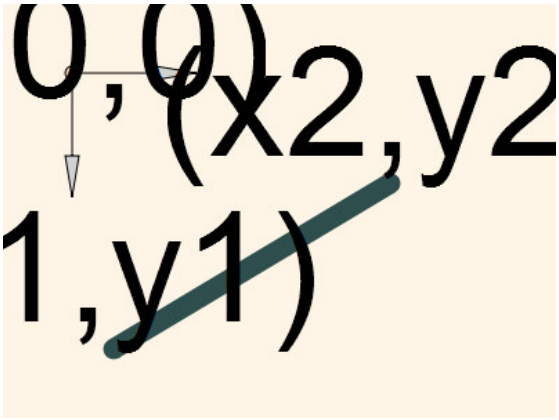
```
<?xml version="1.0"?>
<svg xmlns="http://www.w3.org/2000/svg"
     xmlns:xlink="http://www.w3.org/1999/xlink"
     viewBox="-50 -50 400 300">

  <rect x="50" y="50" width="250" height="150" stroke="blue" fill="gray"/>
  <circle cx="100" cy="120" r="80" stroke="black" fill="lightgreen"/>
  <line x1="0" y1="150" x2="250" y2="0" stroke="red" stroke-width="15"/>
</svg>
```

Grundlegende Geometrieelemente

- line
- circle
- ellipse
- rect
- polyline
- polygon
- path

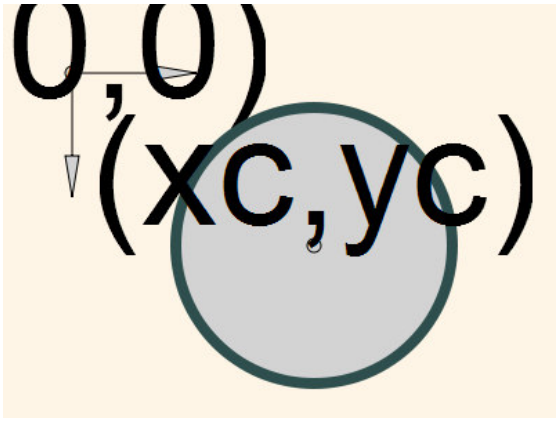
line



Syntax

```
<line x1="[xstart]"
      y1="[ystart]"
      x2="[xend]"
      y2="[yend]"
      [presentation-attributes]/>
```

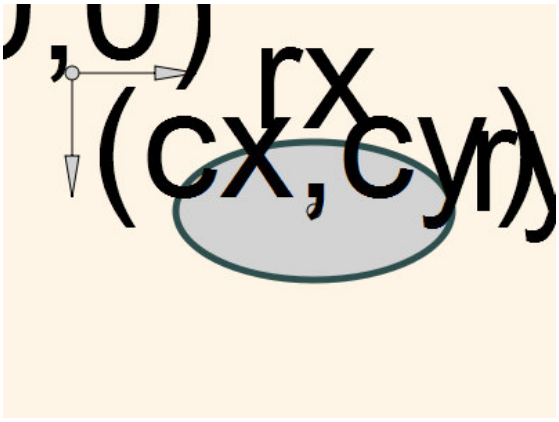
circle



Syntax

```
<circle cx="[center-x]"
        cy="[center-y]"
        r="[radius]"
        [presentation-attributes]/>
```

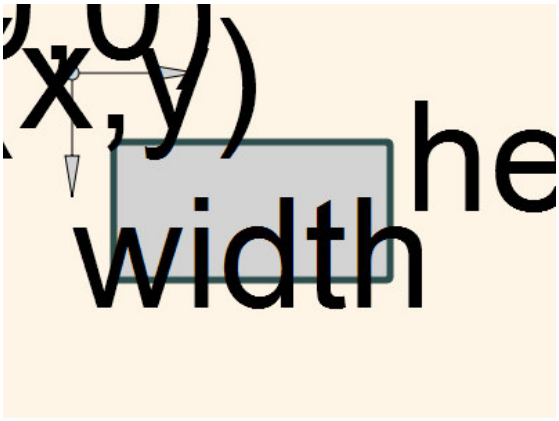
ellipse



Syntax

```
<ellipse cx="[center-x]"
         cy="[center-y]"
         rx="[radius-x]"
         ry="[radius-y]"
        [presentation-attributes]/>
```

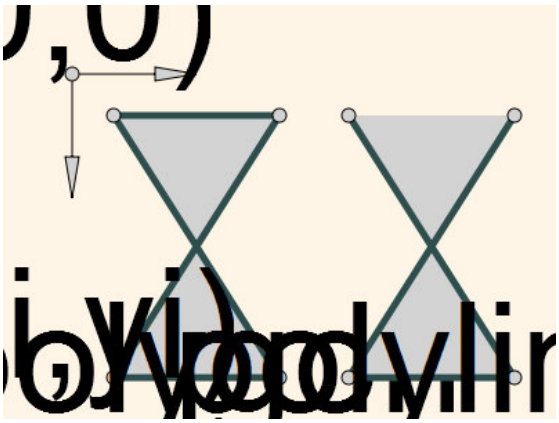
rect



Syntax

```
<rect x="[upper-left-x]"
      y="[uper-left-y]"
      width="[width]"
      height="[height]"
      rx="[radius-x]"
      ry="[radius-y]"
      [presentation-attributes]/>
```

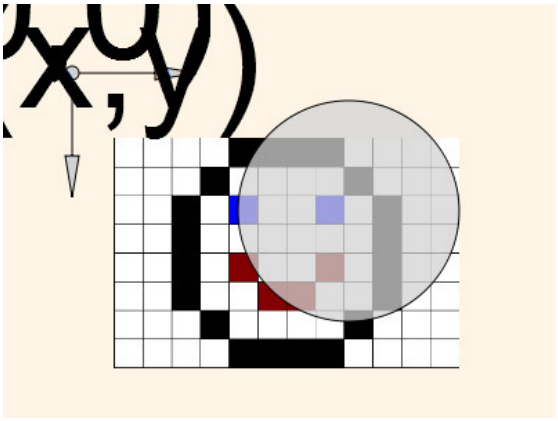
polygon, polyline



Syntax

```
<polygon points="[coordinate-pairs]"
         [presentation-attributes]/>
<polyline points="[coordinate-pairs]"
          [presentation-attributes]/>
```

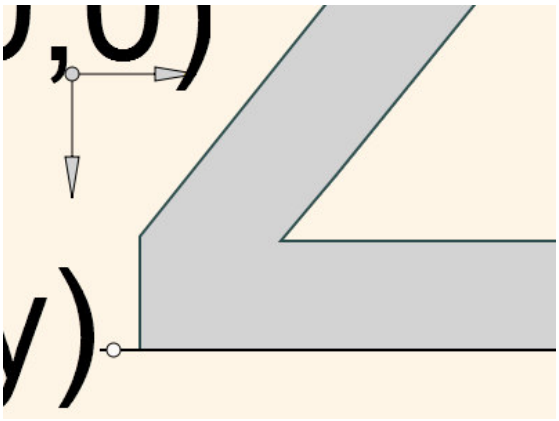
image



Syntax

```
<image x="[upper-left-x]"
       y="[upper-left-y]"
       width="[width]"
       height="[height]"
       xlink:href="[image-uri]" />
```

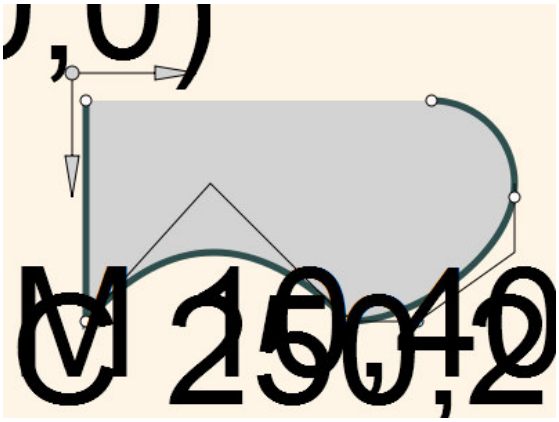
text



Syntax

```
<text x="[base-x]"
      y="[base-y]"
      font-size="[size]"
      font-weight="[size]"
      font-style="[style]"
      text-decoration="[decoration]"
      text-anchor="[start|middle|end]"
      [presentation-attributes]>text content</text>
```

path



Syntax

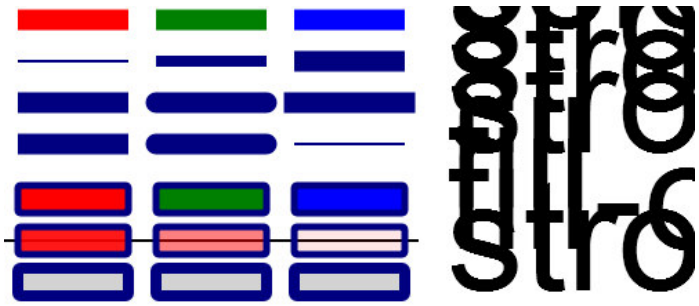
```
<path d="[list-of-path-commands]"
      [presentation-attributes]>text content</text>
```

Farben

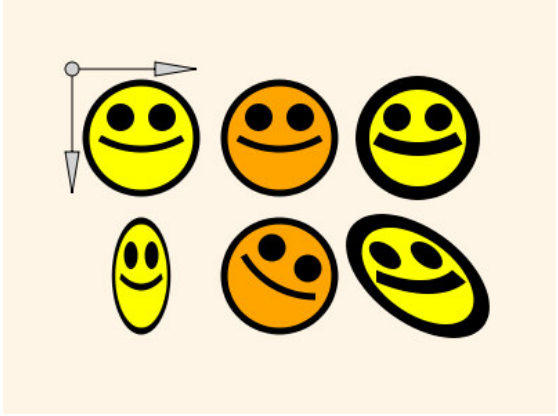
- Bezeichnung … *red*
- dezimale RGB Darstellung … *rgb(128,0,64)*
- prozentuale RGB Darstellung … *rgb(20%,30,0%)*
- hexadezimales, 6-stelliges RGB … *#fa790b*
- hexadezimales, 3-stelliges RGB … *#e60*

Im Web finden wir zahlreiche Farbtabellen.

attributes



Gruppen



Example

```
<?xml version="1.0"?>
<svg xmlns="http://www.w3.org/2000/svg"
     xmlns:xlink="http://www.w3.org/1999/xlink"
     width="400" height="300" viewBox="-50 -50 400 300">
  <defs>
    <g id="smiley">
      <circle cx="0" cy="0" r="40" stroke="black" />
      <circle cx="-15" cy="-15" r="10" fill="black" />
      <circle cx="15" cy="-15" r="10" fill="black" />
      <path d="M -30,0 A 60,60,0,0,0,30,0" stroke="black" fill="none" />
    </g>
  </defs>

  <use x="50" y="50" xlink:href="#smiley" stroke-width="5" fill="yellow"/>
  <use x="150" y="50" xlink:href="#smiley" stroke-width="5" fill="orange"/>
  <use x="250" y="50" xlink:href="#smiley" stroke-width="10" fill="yellow"/>
  <use xlink:href="#smiley" stroke-width="5" fill="yellow"   transform="translate(50,150)
  <use xlink:href="#smiley" stroke-width="5" fill="orange" transform="translate(150,150)
  <use xlink:href="#smiley" stroke-width="10" fill="yellow" transform="translate(250,150)
</svg>
```