SVG For Beginner

สุเกติองค์ ภู่พัฒน์

ฝ่ายวิจัยและพัฒนาเทคโนโลยีคอมพิวเตอร์เพื่อการคำนวณ
ศูนย์เทคโนโลยีอิเล็กทรอนิกส์และคอมพิวเตอร์แห่งชาติ
สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ
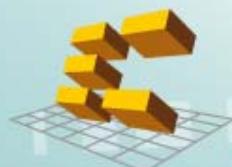
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- SVG content
- Coordinates System
- Document Structure
- Basic shapes
- Text
- Animation
- Any Questions
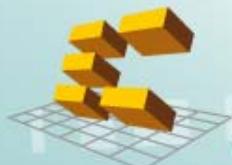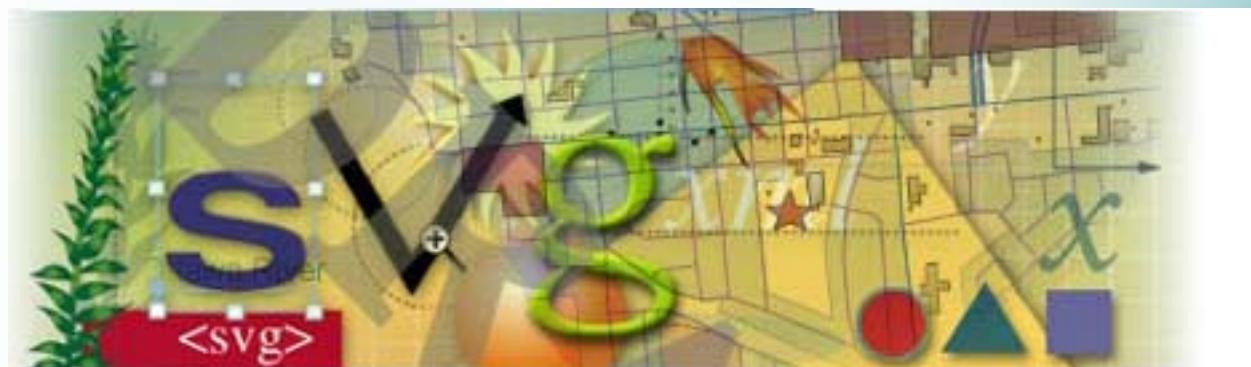
- SVG MIME type:

  - the MIME type for SVG is "image/svg+xml".

```
<embed width="500" height="500" src="callSVG.svg"
    name="svg" type="image/svg+xml">
```

- File name extension

  - SVG files have extension ".svg"

  - gzip-compressed SVG files have extension ".svgz"
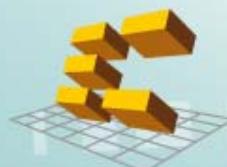
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- Here are some sample compression results using 'gzip' compression on SVG documents:

Uncompressed SVG	With gzip compression	Compressionratio
12,912	2,463	81%
12,164	2,553	79%
11,613	2,617	77%
18,689	4,077	78%
13,024	2,041	84%

Reference from :: http://www.w3.org/TR/SVG11/minimize.html
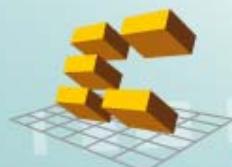
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- Viewport
- Using Default User Coordinates
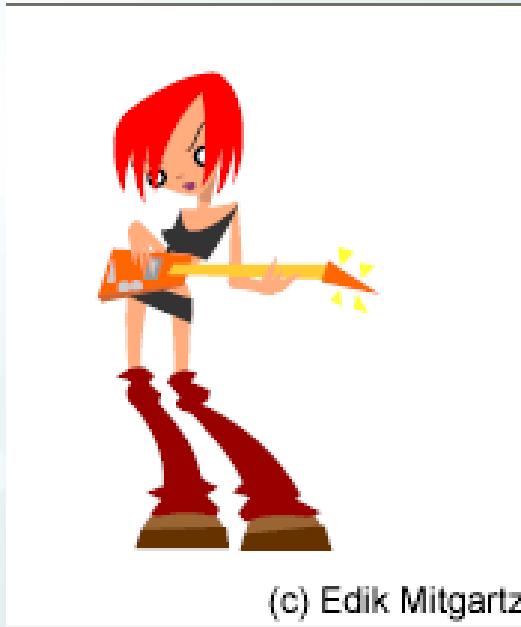

(c) Edik Mitgartz

- The SVG Canvas describes "the space where the SVG content is rendered".
- The area of canvas is called the "Viewport ".
- Size of the viewport with "width" and "height" attribute on the <svg> element.
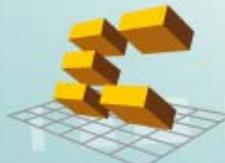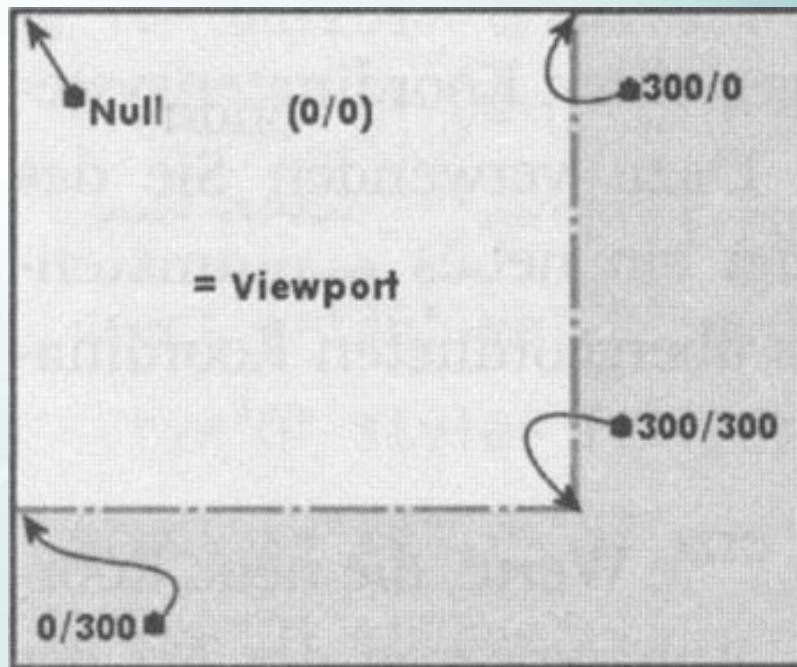
<svg width="300" height="300">

- The upper left corner of the viewport as (0,0) is also call "Original "
- The default viewer sets up a coordinate system the horizontal as increase to right and the vertical as increase to downward.
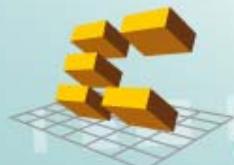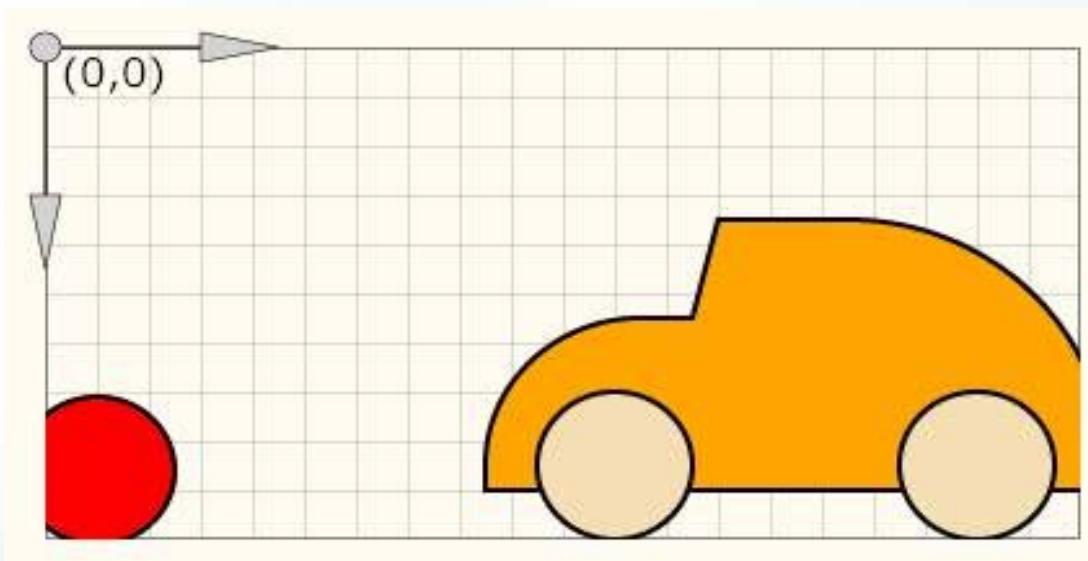
An SVG document fragment can consist of any number
SVG elements contained in an 'svg' element

- The 'svg' element
- The 'g' element
- The 'defs' element
- The 'image' element
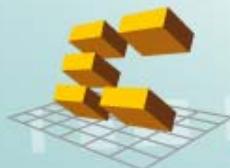
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- Embedded within other SVG document fragment.
- Establish a new viewport.

```
<?xml version="1.0"?>
<! DOCTYPE svg PUBLIC "-//W3C//DTD SVG 1.0//EN"
   "http://www.w3.org/TR/2001/REC-
   SVG20010904/DTD/svg10.dtd">
<svg width="200 px" height="200 px">
   <title> SVG Pre-Seminar .</title>
   <desc> SVG is a good web graphic. </desc>
   <!--  the drawing will go there  -- >
</svg>
```
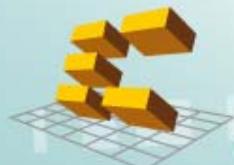
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- Container element for grouping together related graphics elements.
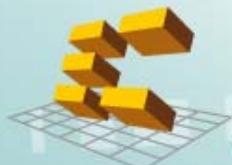
```
<svg width="200px" height="200px">
    <g id="graphic">
        <rect ../>
        <rect ../>
    </g>
</svg>
```

Container element for referenced elements.
It is recommended that,you put all objects that
you wish to re-use within a 'defs' tag
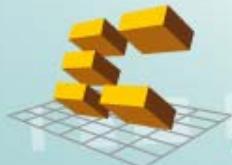
```
<defs>
    <linearGradient id="Gradient01">
        <stop offset="20%" stop-color="#39F" />
        <stop offset="90%" stop-color="#F3F" />
    </linearGradient>
</defs>
```

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It can refer to raster image files such as PNG
or JPEG or to files with MIME type of "image/svg+xml".

```
<svg width="200 px" height="200 px">
    .
    <image x="50" y="50" width="100" height="100
    xlink:herf="myimage.png" />
    .
</svg>
```
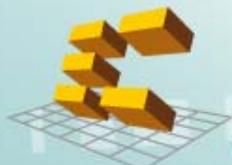
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SVG contains the following set of basic shape elements

- Rectangle
- Circle
- Ellipse
- Line
- Polyline
- Polygon
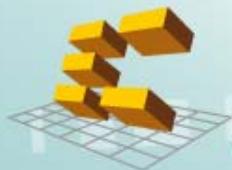
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The 'rect' element defines a rectangle which is axis-aligned with the current coordinations system.
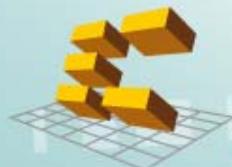
```
<rect x="10" y ="10" width="200" height="100" fill="yellow"/>
```

(10,10)

```
<rect x="10" y ="10" width="200" height="100" rx="20"
    ry="30" fill="yellow"/>
```
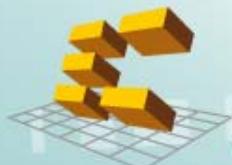
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- The 'circle' element defines a circle base on a center point and a radius.
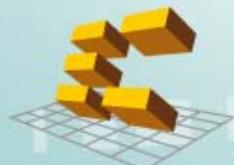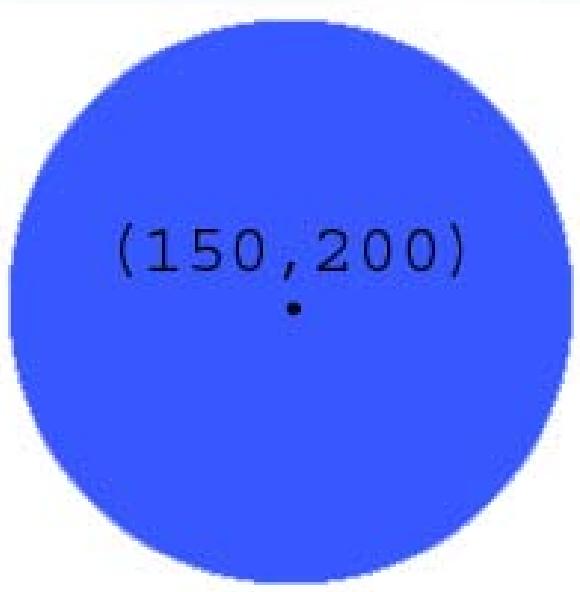
```
<circle cx="150" cy="200" r="100" fill="blue" />
```


(150,200)

- The 'ellipse' element defines an ellipse which is axis-aligned with the current user coordinate system based on a center point and two radius.
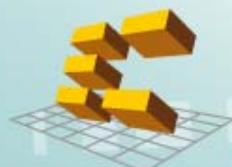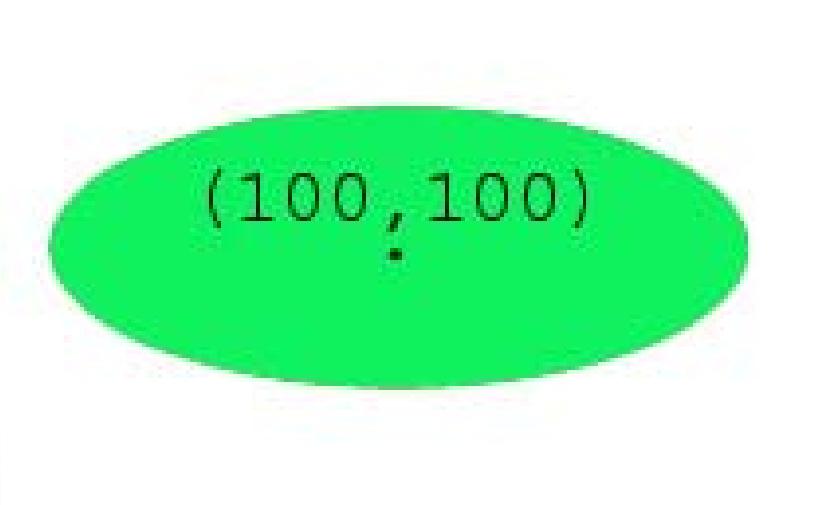
```
<ellipse cx="100" cy="100" rx="200" ry="100" fill="green" />
```

(100,100)

- The 'line' element defines a line segment that starts at one point and ends at other.

```
<line  x1="100" y1="350" x2="350" y2="100"
    stroke="#FF0099"  stroke-width="5" />
```
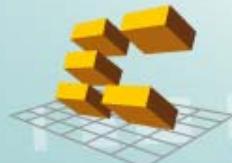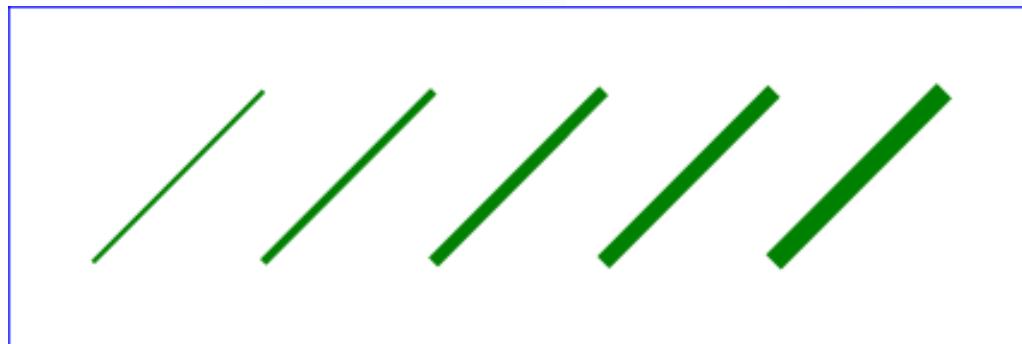
- The 'polyline' element defines a set of connected straight line segments.

```
<polyline fill="none" stroke="blue" stroke-width="10"
    point=" 50,375  150,375  150,325  250,325  250,375 ….
    1050,375  1150,375 " />
```
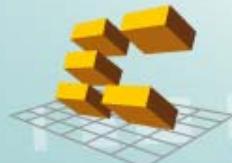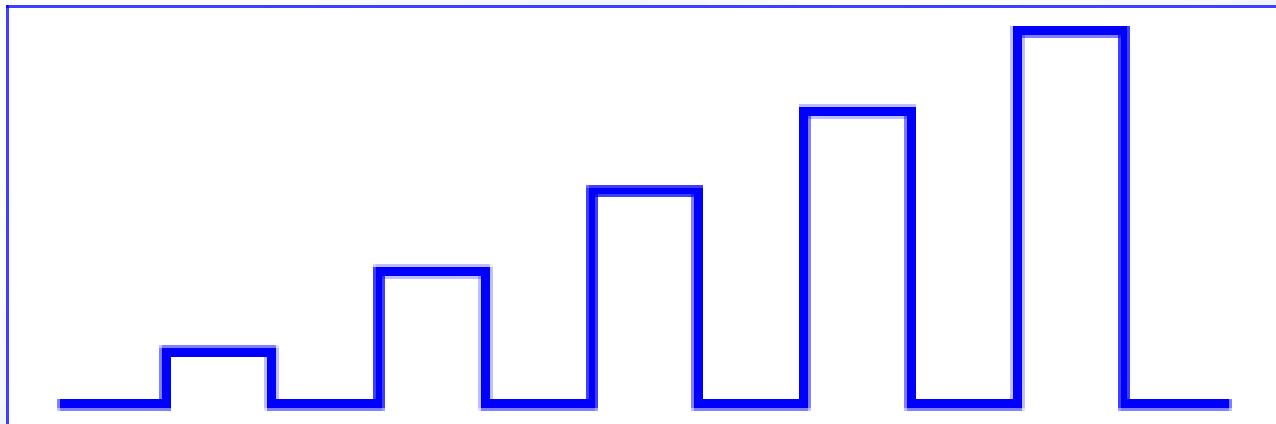
- The 'polygon' element defines a close shape consisting of a set of connected straight line segments.

```
<polygon fill="red" stroke="blue" stroke-width="10"
    point="350,75 379,161 469,161 397,215 … 321,161" />
```
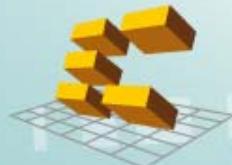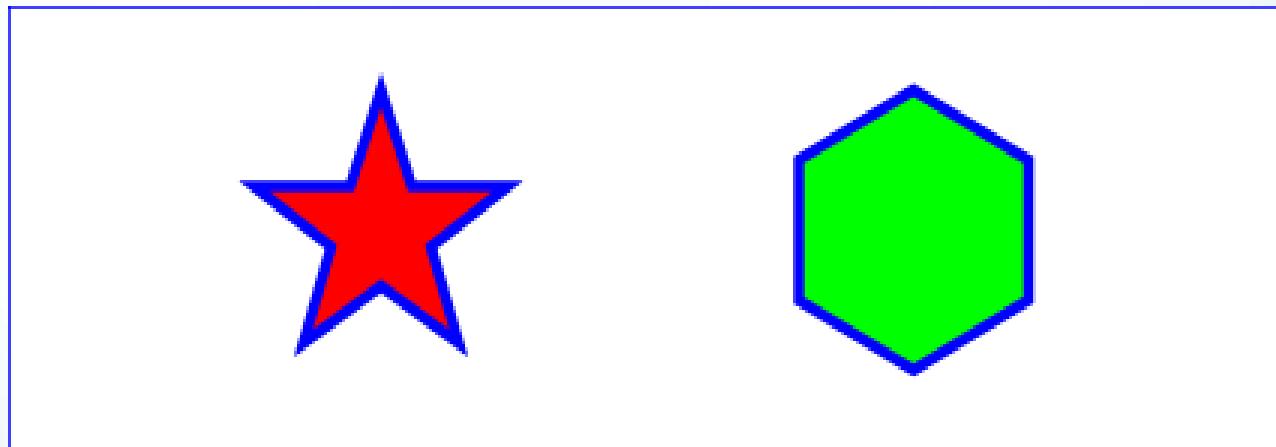
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SVG supports the following international text processing features for both straight line Text and text on the path :
- horizontal and vertical orientation of text
- left-right or bidirectional text
- when SVG fonts are used, automatic selection of the correct glyph corresponding
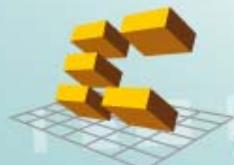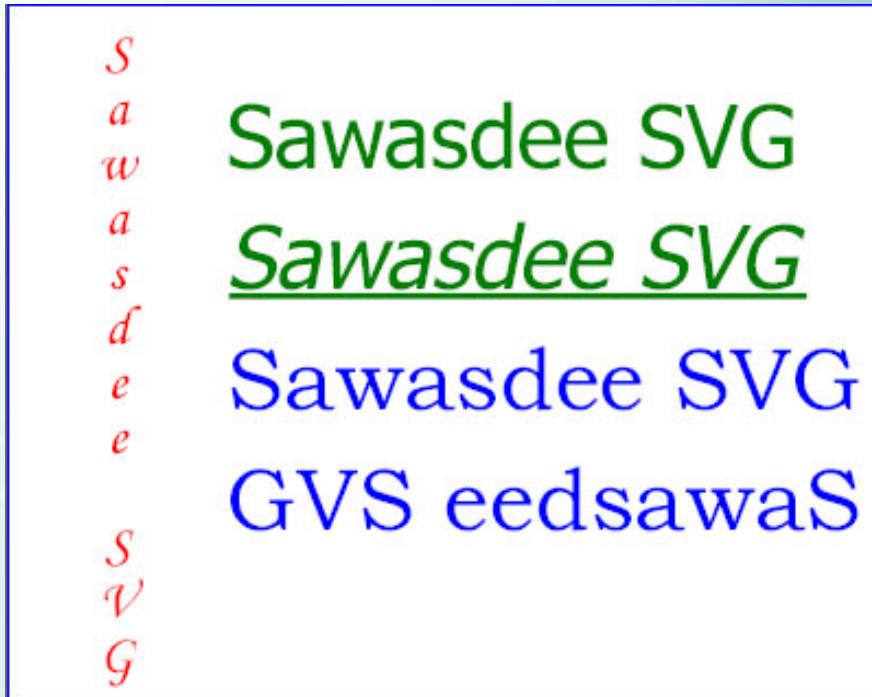
- text element
- tspan element
- tref element
- How to use Thai font ?
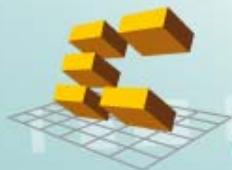
The 'text' element defines a graphics element consisting of text.

```
<text x="250" y="150" font-family="Verdana"
    font-size="55" fill="blue" >
    Hello, out there
</text>
```
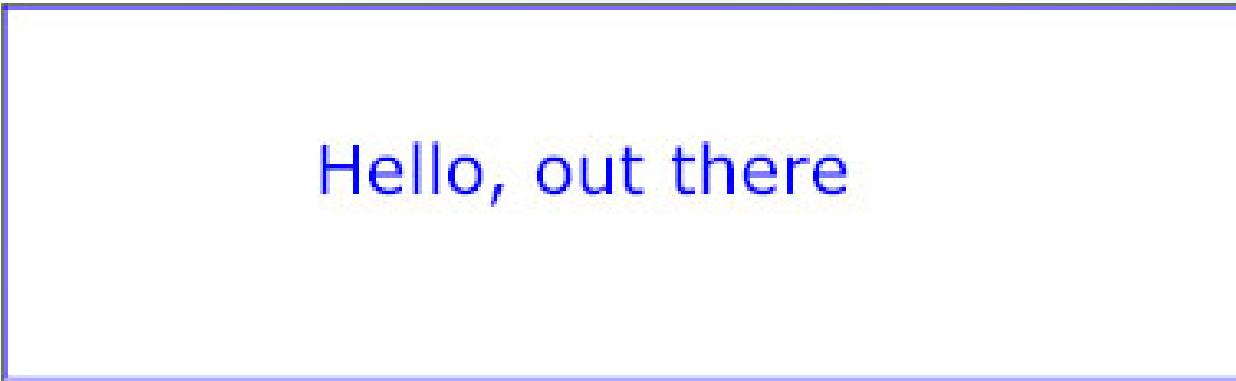
Hello, out there
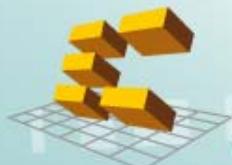
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The 'tspan' element can be adjusted with absolute or relative coordinate values within a 'text' element.

```
<text x="200" y="150" fill="blue" >
    You are
    <tspan font-weight="bold" fill="red" >not</tspan>
    a banana.
</text>
```

You are**not**a banana.
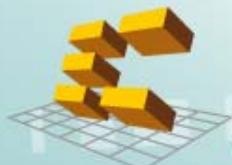
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The <tref> element references text that has been created in a <defs> element, either in the same or another SVG document.

```
<defs>
   <text id="ReferT"> Referenced character data </text>
</defs>
<text x="150" y="150" font-size="45" fill="red" >
   <tref xlink:href="#ReferT"/>
</text>
```

Referenced character data
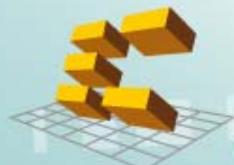
- set xml encoding to "UTF-8"

  <?xml version="1.0" encoding="UTF-8"?>

- insert " xml:lang='th' " in text element

- set font-family to Thai font
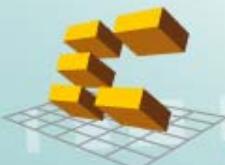
  <text xml:lang='th' font-family="AngsanaUPC , Tahoma,JasmineUPC">

ภาษาไทย

SVG incorporates some features and approaches that are part of the "Synchronized Multimedia Integration Language (SMIL)

SVG supports the following basic four animation elements
- animation
- set
- animationMotion
- animationColor
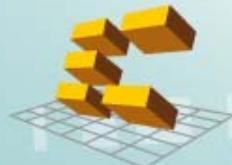
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Allow scalar attributes and properties to be assigned different values over time.

```
<rect x="50" y="20" width="50" height="50" fill="blue"
    stroke-width="1">
    <animate attributeName="width" attributeType="XML"
    stroke="green" begin="0s" dur="4s" fill="freeze"
    from="50" to="100" />
</rect>
```
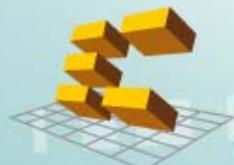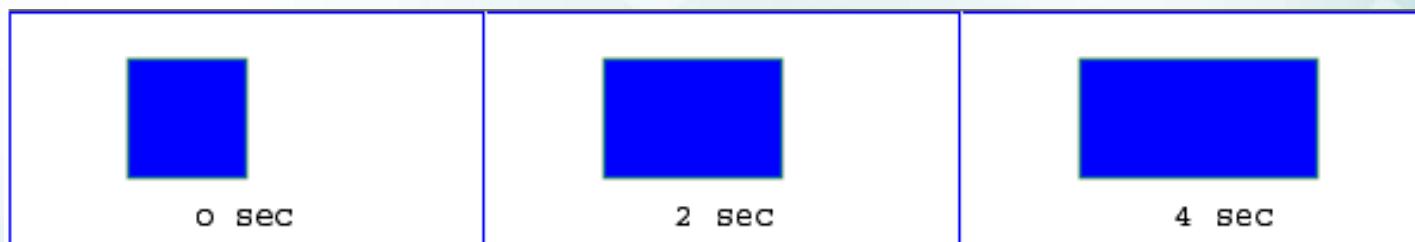

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A convenient shorthand for 'animation', which is useful for assigning animation value for non-numeric attributes and properties.

```
<text x="100" y="50" font-size="18" visibility="hidden">
    <set attributeName="visibility" attributeType="CSS"
    to="visible" begin="2s" dur="1s" fill="freeze"/>
    All gone!
</text>
```
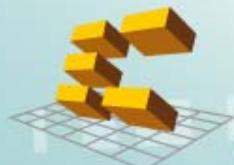
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S
V
G

The 'animateMotion' element causes a referenced
element to move along a motion path

```
<path id="refP" d="M20,75 C 60,25 110,125, 180,125"
    style="fill:none; stroke: blue;"/>
    <rect width="20" height="20" style="fill: #cfc; stroke:
    green;">
    <animateMotion dur="6s"  fill="freeze" rotate="auto">
    <mpath xlink:href="#refP"/> </animateMotion>
</rect>
```
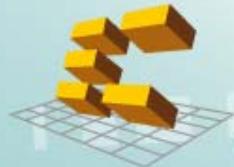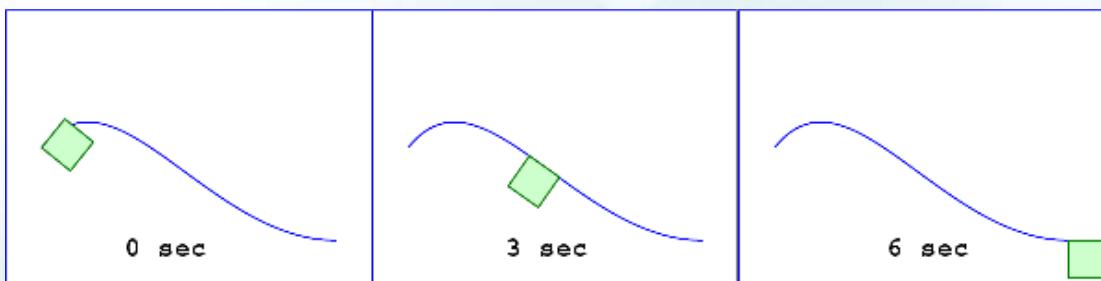

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The 'animateColor' element specifies a color transformation over time

```
<circle cx="60" cy="60" r="30" style="fill: #ff9;
    stroke: gray; stroke-width= 10;">
    <animateColor attributeName="fill" begin="2s"
    dur="4s" from="#ff9" to="red" fill="freeze"/>
    <animateColor attributeName="stroke" begin="2s"
    dur="4s" from="gray" to="blue" fill="freeze"/>
</circle>
```

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Any Question ?

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