

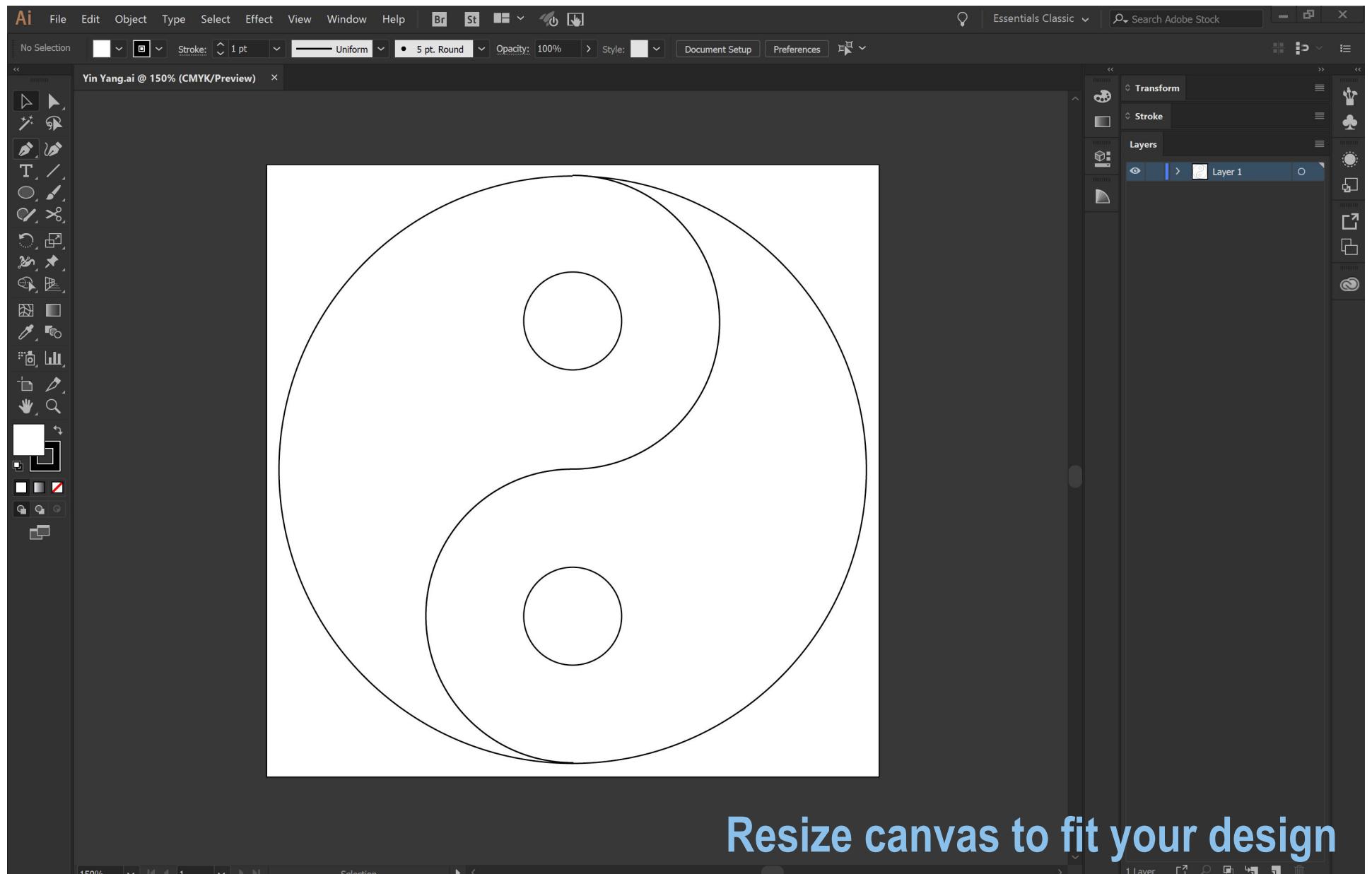
SVG

How to animate your vectors to bring your webpage to life

05-430 PUI section c
[Bonus] Assignment #9

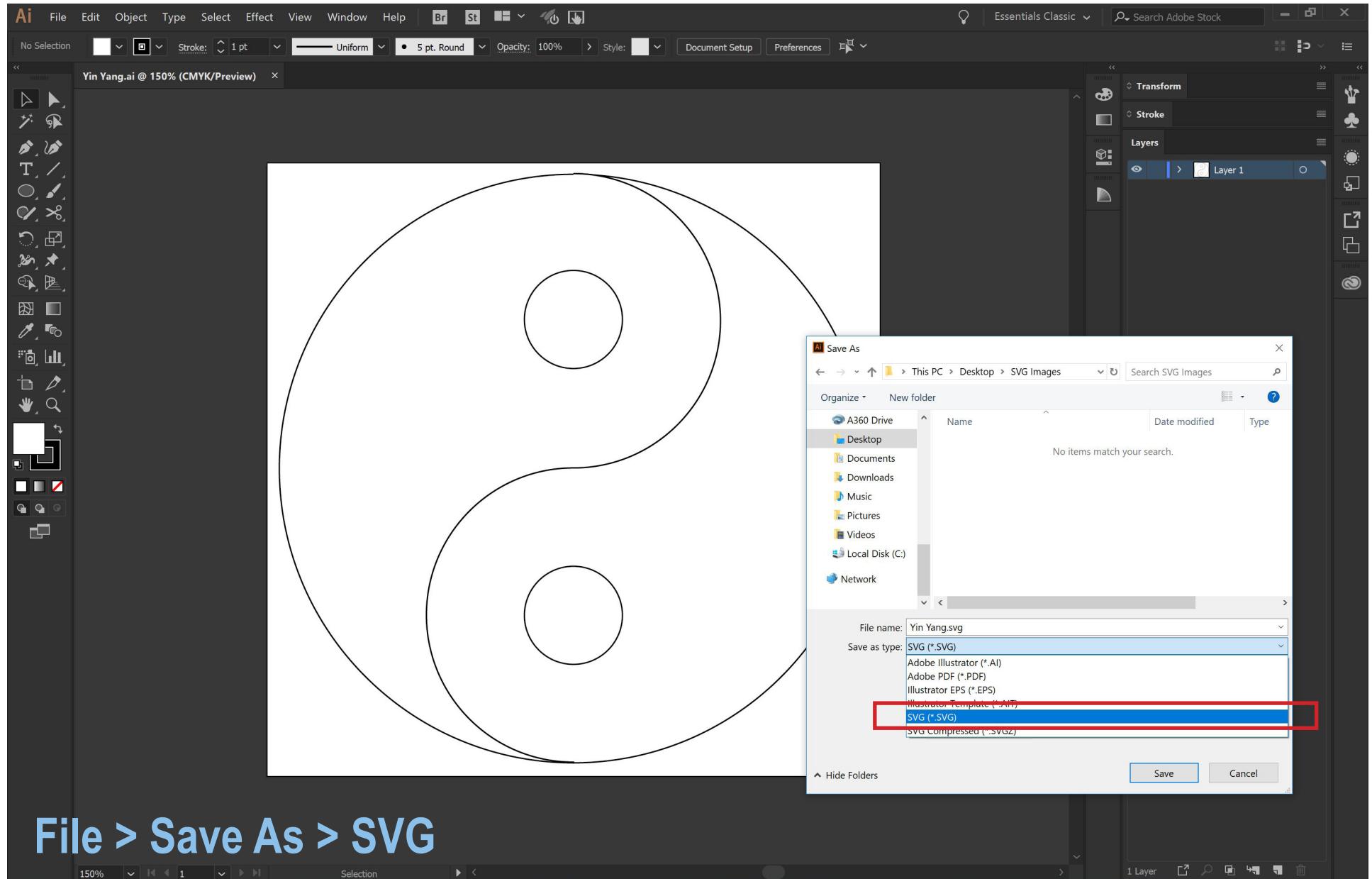
Jamie Ho

[1] Start off with your Adobe Illustrator vector design



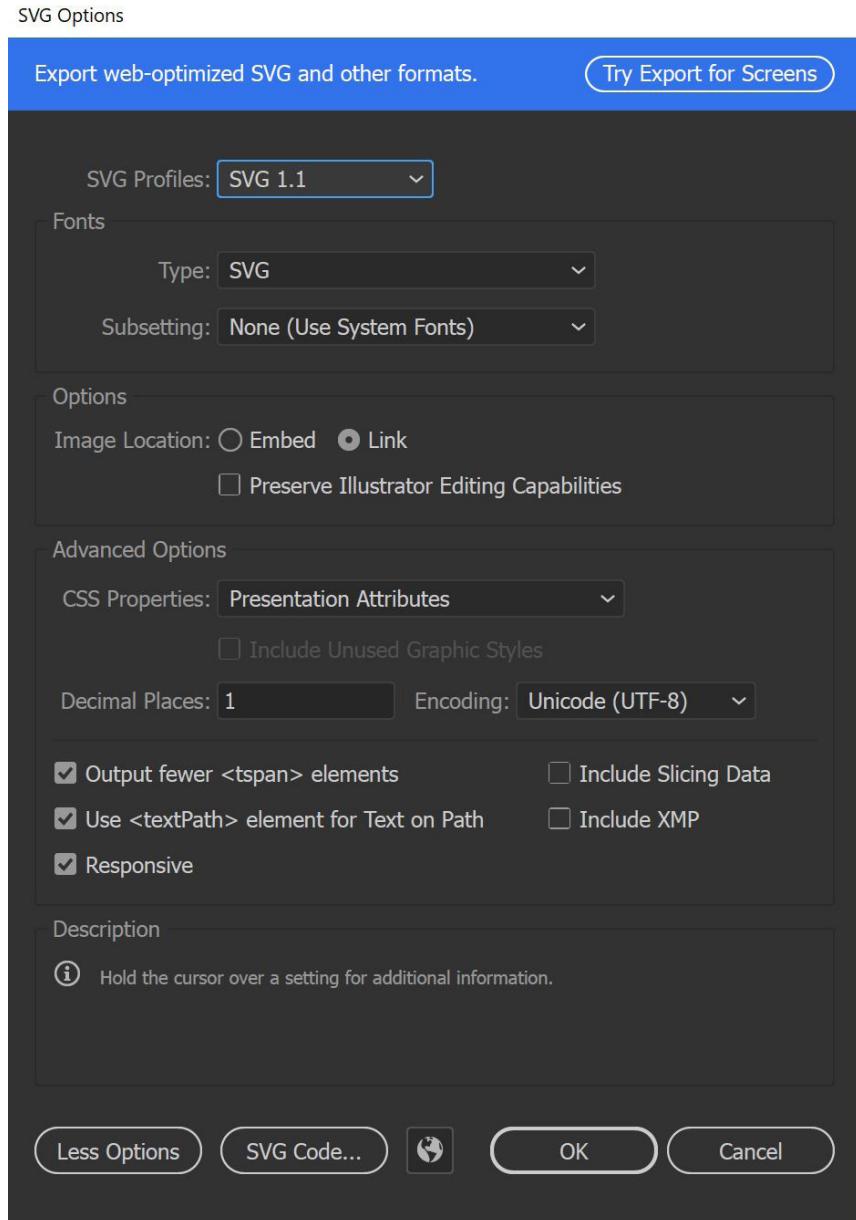
Resize canvas to fit your design

[2] Saving as SVG



File > Save As > SVG

[3] Option selection popup window



Explanation of Options

SVG Profiles:

SVG 1.0 SVG 1.1 SVG Tiny SVG Basic

SVG 1.1 is the latest version and is the most suitable option today

Fonts > Type:

SVG Convert to Outlines

SVG = Enables the font format, provided the fonts are available on the browser used

Convert to Outlines = Turns text into vector paths, but will lose accessibility, searchability and copy-ability

Fonts > Subsetting:

None Only Glyphs Used

Subsetting means to include all/part/none of a font (Glyphs are characters of a particular font)

*None is selected here because no fonts are used as there are no texts

Options > Image Location:

Embed Link

*Embed is selected because it ensures image will always be available, though it does increase file size

Options > Preserve Illustrator Editing Capabilities:

Uncheck Check

Select only if you plan to reopen and edit the SVG file in illustrator

Advanced Options > CSS Properties:

Presentation Style Style (Entity References) Style Elements

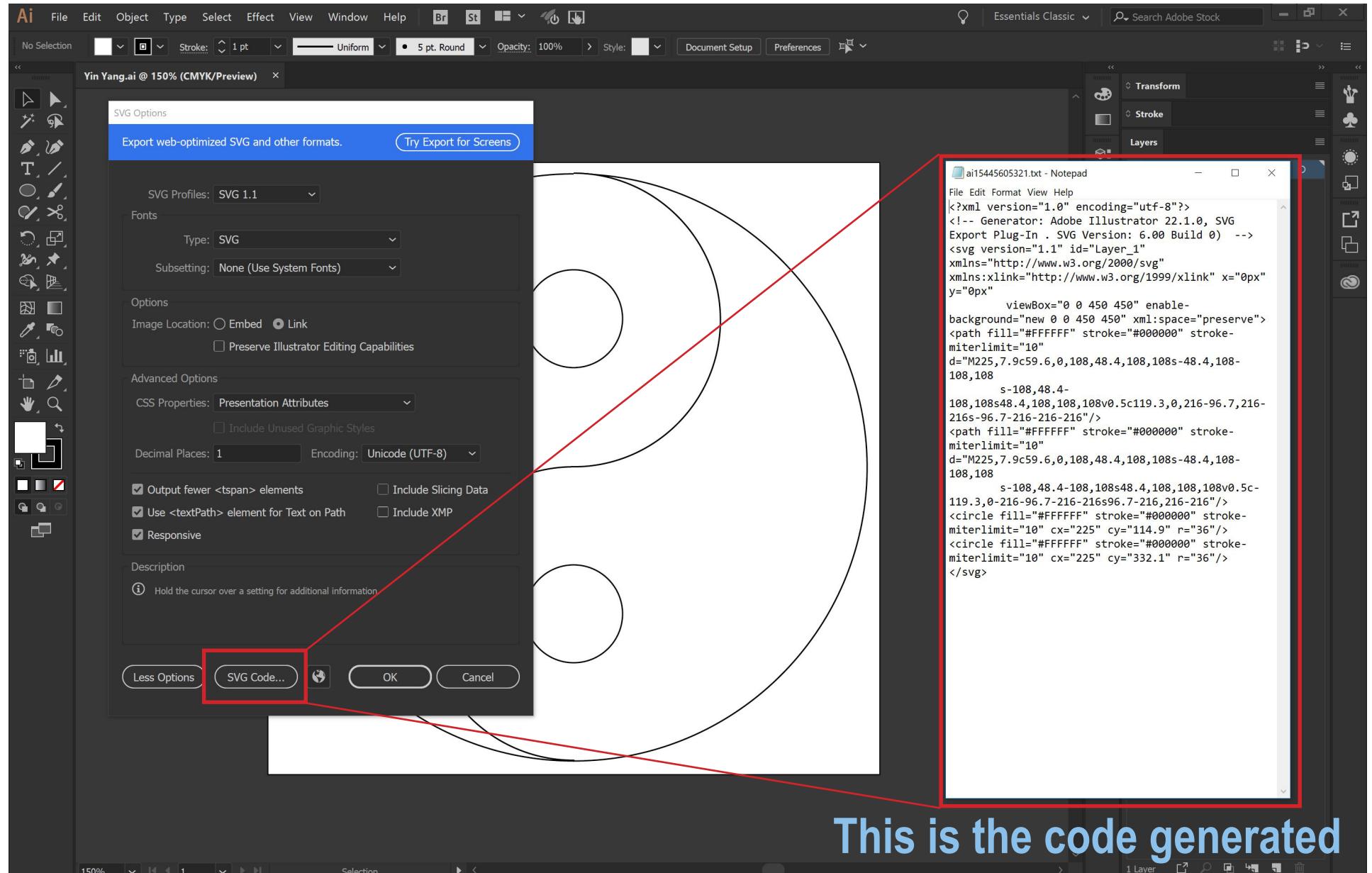
Presentation Attributes = Allows most flexibility for edits and transformations

Style Attributes = Selected if SVG code is used in transformations using XSLT

Style Attributes (Entity References) = Faster rendering times and reduced SVG file size

Style Elements = Used when sharing files with HTML doc but slows down rendering speeds

[4] Generating the code



[5] Modify the code

```
<?xml version="1.0" encoding="utf 8"?>
<! Generator: Adobe Illustrator 22.1.0, SVG Export Plug-In . SVG Version: 6.00 Build 0) -->

<svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"
x="0px" y="0px" viewBox="0 0 450 450" enable-background="new 0 0 450 450" xml:space="preserve">

    <path fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,10
    8s-48.4,108-108,108s-108,48.4-108,108s48.4,108,108,108v0.5c119.3,0,216-96.7,216-
    216s-96.7-216-216-216"/>

    <path fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,10
    8s-48.4,108-108,108s-108,48.4-108,108s48.4,108,108,108v0.5c-119.3,0-216-96.7-216-
    216s96.7-216,216-216"/>

    <circle fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" cx="225" cy="114.9" r="36"/>
    <circle fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" cx="225" cy="332.1" r="36"/>

</svg>
```

**Remove the unnecessary parts
Copy and paste into text editor**

[6] Edit code in text editor

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <!-- styles -->
5   <link rel="stylesheet" type="text/css" href="style.css">
6 
7   <title>Yin Yang</title>
8 </head>
9 
10 <body>
11   <div class="main-container">
12     <div class="svg">
13 
14       <!-- this is the code copied from illustrator -->
15       <svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg"
16         xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0
17         450 450" enable-background="new 0 0 450 450" xml:space="preserve">
18 
19         <!-- this is the yin curve -->
20         <path class="curve1" fill="#FFFFFF" stroke="#000000" stroke-
21           miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,108s-48.4,108-108,108
22           s-108,48.4-108,108s48.4,108,108v0.5c119.3,0,216-96.7,216-216s
23             -96.7-216-216"/>
24 
25         <!-- this is the yang curve -->
26         <path class="curve2" fill="#FFFFFF" stroke="#000000" stroke-
27           miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,108s-48.4,108-108,108
28           s-108,48.4-108,108s48.4,108,108v0.5c-119.3,0-216-96.7-216-
29             216s96.7-216,216-216"/>
30 
31         <!-- this is the yin circle -->
32         <circle class="circle1" fill="#FFFFFF" stroke="#000000" stroke-
33           miterlimit="10" cx="225" cy="114.9" r="36"/>
34 
35         <!-- this is the yang circle -->
36         <circle class="circle2" fill="#FFFFFF" stroke="#000000" stroke-
37           miterlimit="10" cx="225" cy="332.1" r="36"/>
38 
39     </svg>
40 
41   </div>
42 </div>
43 
44 </body>
```

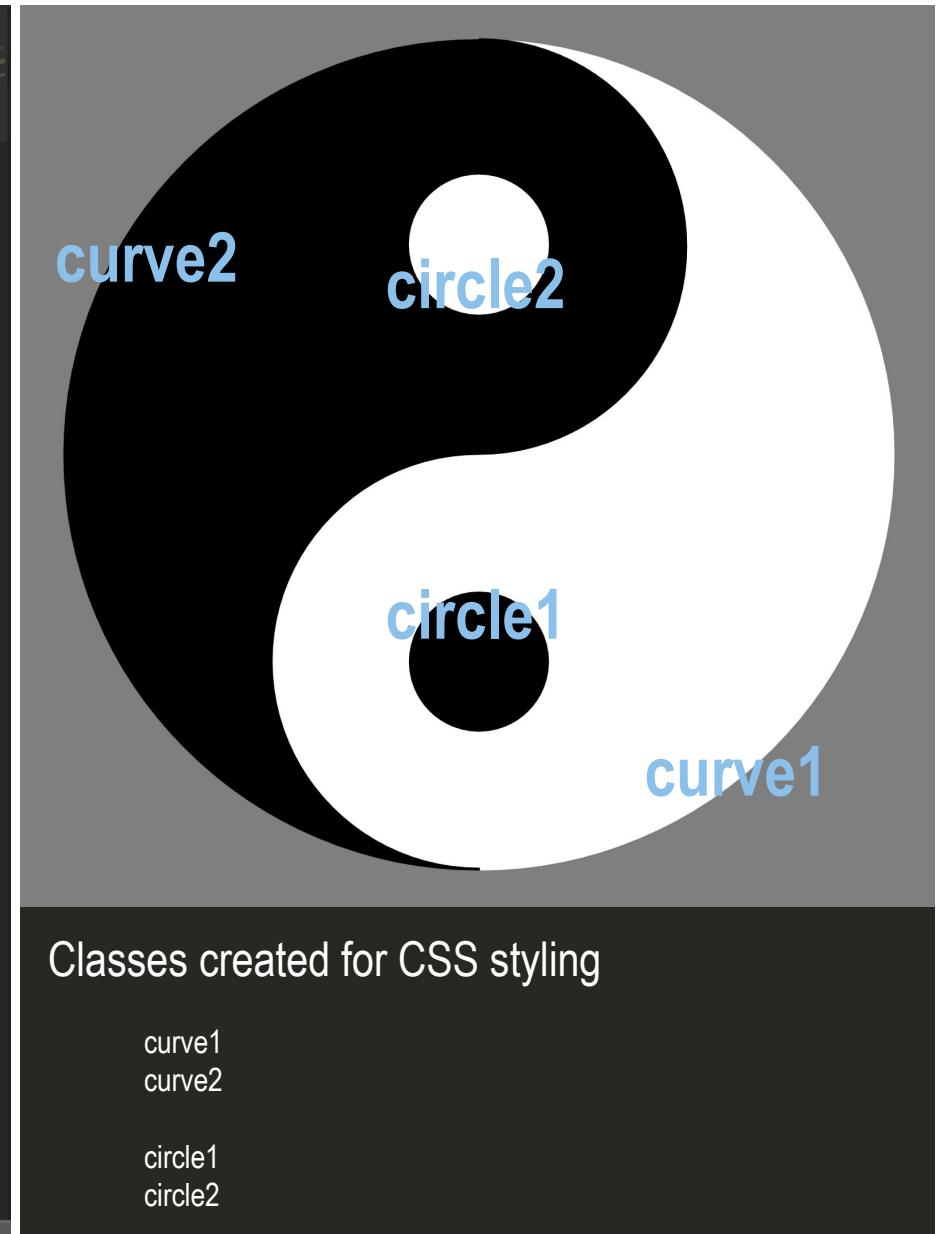
Organise and add classes/IDs

Line 39, Column 8

Tab Size: 4

HTML

index.html



[7] Style the elements in CSS

style.css

```
1 body {  
2     height: 100%;  
3     width: 100%;  
4     background-color: rgba(0, 0, 0, 0.5);  
5 }  
6  
7 .svg {  
8     width: 50vw;  
9     position: absolute;  
10    top: 10vh;  
11    right: 25vw;  
12 }  
13  
14 .curve1, .curve2, .circle1, .circle2 {  
15     stroke-dasharray: 2000;  
16     opacity: 1;  
17 }  
18  
19 /* yin curve WHITE */  
20 .curve1 {  
21     stroke: white;  
22     fill: white;  
23     animation: animateW 5s cubic-bezier(0, 0.23, 1, 0.1);  
24 }  
25 /* yang curve BLACK */  
26 .curve2 {  
27     stroke: black;  
28     fill: black;  
29     animation: animateB 5s cubic-bezier(0, 0.23, 1, 0.1);  
30 }  
31 /* yang circle BLACK */  
32 .circle1 {  
33     stroke: white;  
34     fill: white;  
35     animation: animateW 5s cubic-bezier(0, 0.23, 1, 0.1);  
36 }  
37 /* yin circle WHITE */  
38 .circle2 {  
39     stroke: black;  
40     fill: black;  
41     animation: animateB 5s cubic-bezier(0, 0.23, 1, 0.1);  
42 }
```



Note: you may style the body and the svg div however you like. The current settings are just to maximise the svg for presentation purposes.

Style the elements
Don't think about animation yet

```

43  /* WHITE animation */
44  @keyframes animateB {
45    0% {
46      opacity: 0;
47      fill: none;
48      stroke-dashoffset: 2000;
49    }
50    30% {
51      opacity: 10;
52      fill: none;
53      stroke-dashoffset: 2000;
54    }
55    95% {
56      fill: rgba(0, 0, 0, 0);
57    }
58    100% {
59      opacity: 10;
60      fill: black;
61      stroke-dashoffset: 0;
62    }
63  }
64
65
66  /* WHITE animation */
67  @keyframes animateW {
68    0% {
69      opacity: 0;
70      fill: none;
71      stroke-dashoffset: 2000;
72    }
73    30% {
74      opacity: 10;
75      fill: none;
76      stroke-dashoffset: 2000;
77    }
78    95% {
79      fill: rgba(255, 255, 255, 0);
80    }
81    100% {
82      opacity: 10;
83      fill: white;
84      stroke-dashoffset: 0;
85    }
86  }

```

Create keyframes that are binded to class/ID by calling the name

```

14  .curve1, .curve2, .circle1, .circle2 {
15    stroke-dasharray: 3000;
16    opacity: 1;
17  }
18
19  /* yin curve WHITE and yang circle WHITE */
20  .curve1, .circle1 {
21    stroke: white;
22    fill: white;
23    animation: animateW 5s cubic-bezier(0, 0.23, 1, 0.1);
24  }
25  /* yang curve BLACK and yin circle BLACK*/
26  .curve2, .circle2 {
27    stroke: black;
28    fill: black;
29    animation: animateB 5s cubic-bezier(0, 0.23, 1, 0.1);
30  }

```

```
37 /* yin circle WHITE */
38 .circle2 {
39     stroke: black;
40     fill: black;
41     animation: animateB 5s cubic-bezier(0, 0.23, 1, 0.1);
42 }
```

how does the CSS animation property work?

The animation property has many property values that can be coded.
When the class/ID is given an animation property and named, the animation name can specify and bind a keyframe to the class/ID.

CSS syntax

animation: name duration timing-function delay iteration-count direction fill-mode play-state;

Read more on:

https://www.w3schools.com/csSref/css3_pr_animation.asp

how does keyframes work?

Keyframes will allow you to create an animation by gradually making changes in the CSS styling. To do so, specify when the styling will change by using percent (of the animation duration) or with “from” and “to”.

CSS syntax

```
@keyframes _(insert animation-name)_ { }
```

Read more on:

https://www.w3schools.com/cssref/css3_pr_animation-keyframes.asp

Using “from” and “to”

```
@keyframes opacityChange {  
    from { opacity: 0; }  
    to { opacity: 1; }  
}
```

Using percentages

```
@keyframes translation {  
    0% { top: 0px; }  
    15% { top: 10px; }  
    75% {top: 50px; }  
    100% {top: 500px; }  
}
```

Including multiple styling changes

```
@keyframes colourChange {  
    0% { fill: white; opacity: 0.5; }  
    100% { fill: black; opacity: 1; }  
}
```

*note: you should always define the start and end.

what is stroke-dasharray?

CSS property for creating dashes along SVG paths.

The larger the number, the longer the dash/gap.

stroke-dasharray: 5;



stroke-dasharray: 50;



stroke-dasharray: 200;

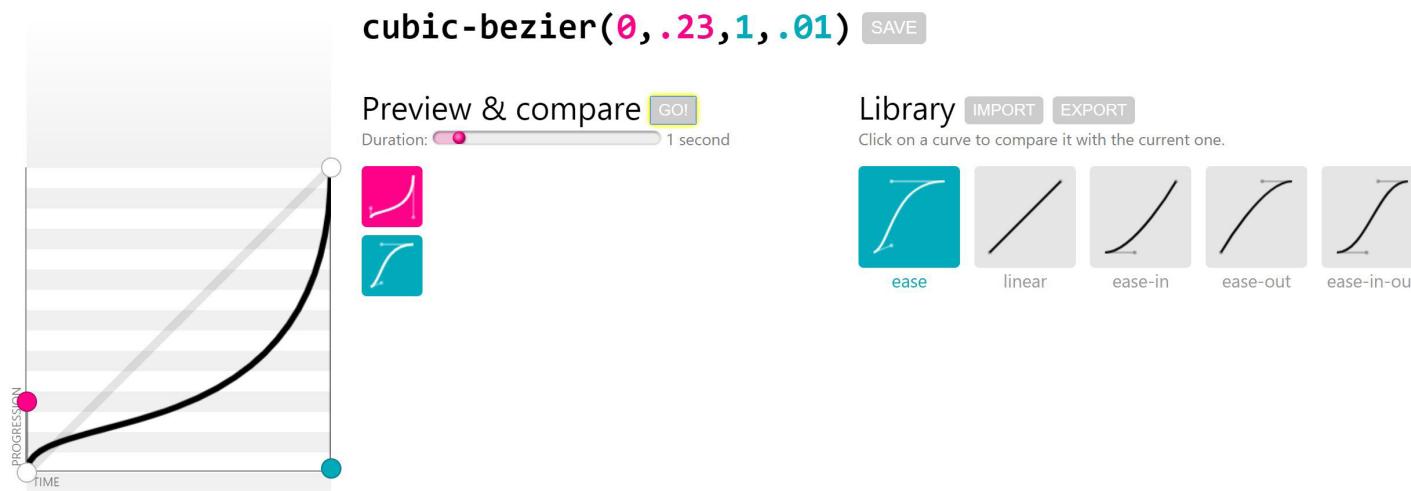


stroke-dasharray: 400;



Read more on:
https://www.w3schools.com/graphics/svg_stroking.asp

See it in action on:
cubic-bezier.com



what is cubic bezier?

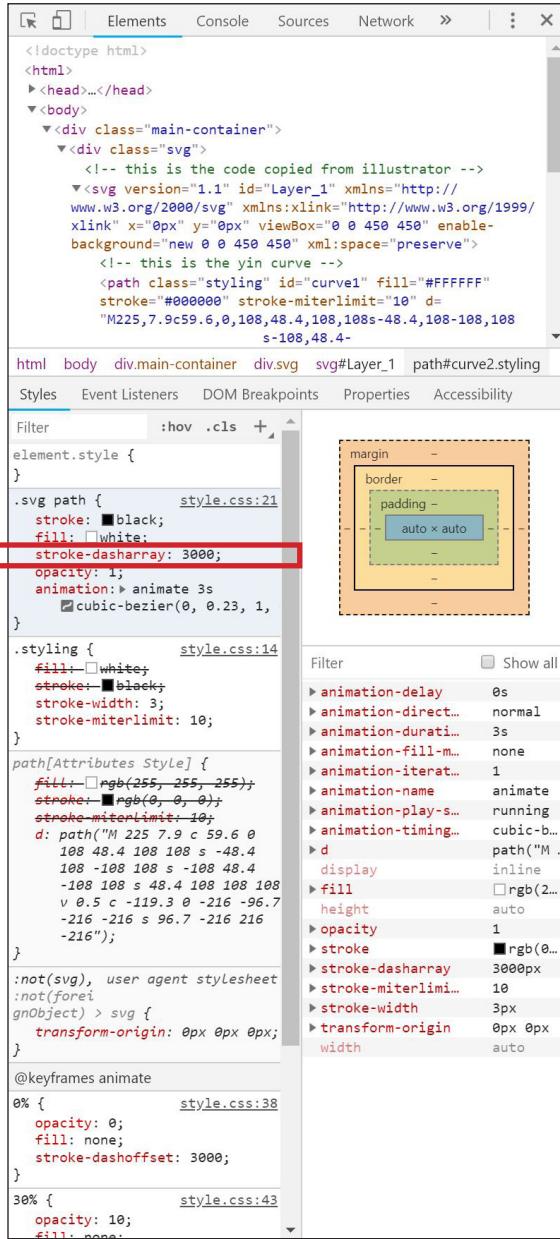
A curve defined by 4 points that represents initial time/state and the final time/state. Using the cubic-bezier() function with the timing-function in animation can create an ease-in and ease-out effect.

CSS syntax

cubic-bezier(x1, y1, x2, y2);
x1 and x2 must be a number within 0 to 1.

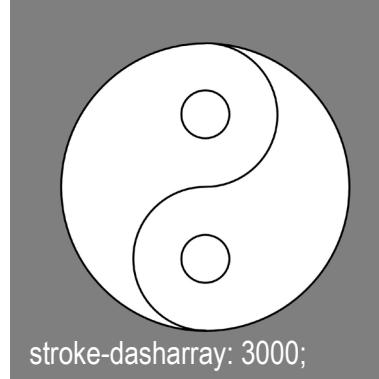
[8] Find the appropriate stroke-dasharray

Right-click webpage and inspect

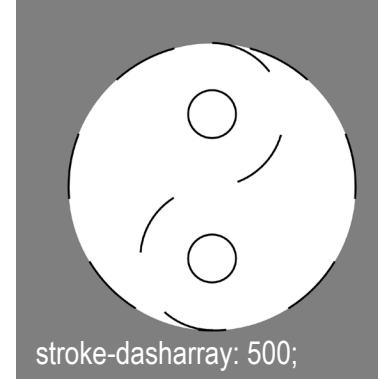


```
<!doctype html>
<html>
  <head>...</head>
  <body>
    <div class="main-container">
      <!-- this is the code copied from illustrator -->
      <div class="svg">
        <!-- this is the yin curve -->
        <svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 450 450" enable-background="new 0 0 450 450" xml:space="preserve">
          <!-- this is the yang curve -->
          <path class="styling" id="curve1" fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,108s-48.4,108-108,108s-108,48.4-108,48.4"/>
        </svg>
      </div>
    </div>
  </body>
</html>
```

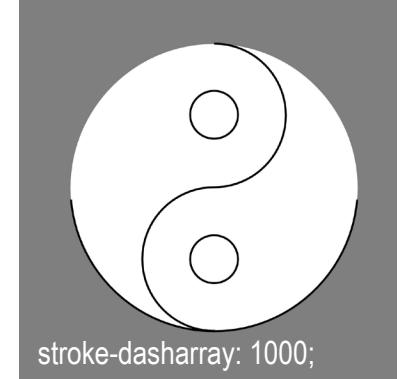
stroke-dasharray: 3000;



stroke-dasharray: 3000;

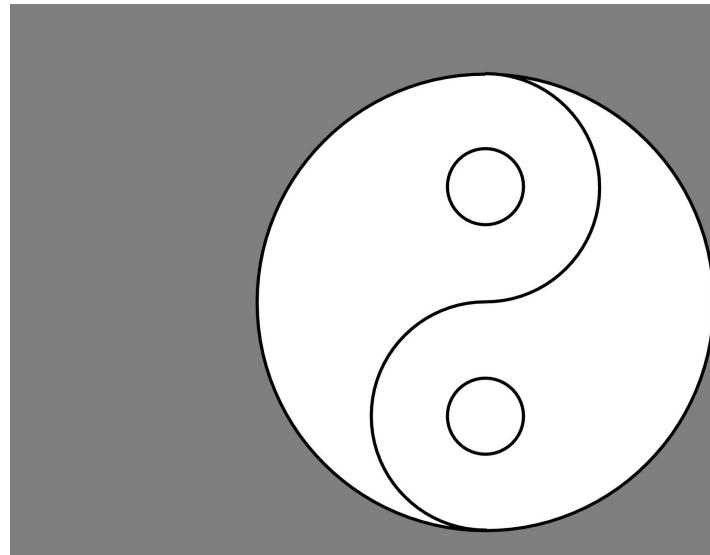


stroke-dasharray: 500;

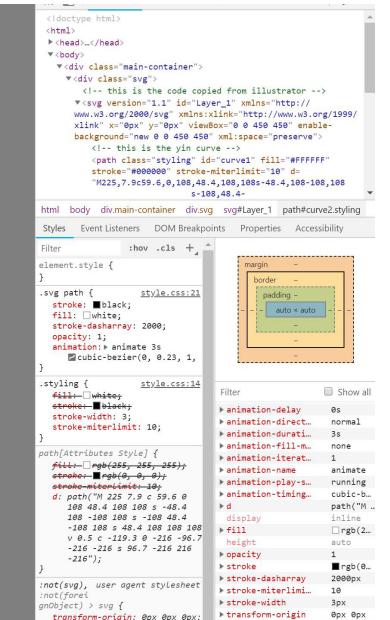


stroke-dasharray: 1000;

Change the stroke-dasharray in the inspector until dash is long enough



stroke-dasharray: 2000;

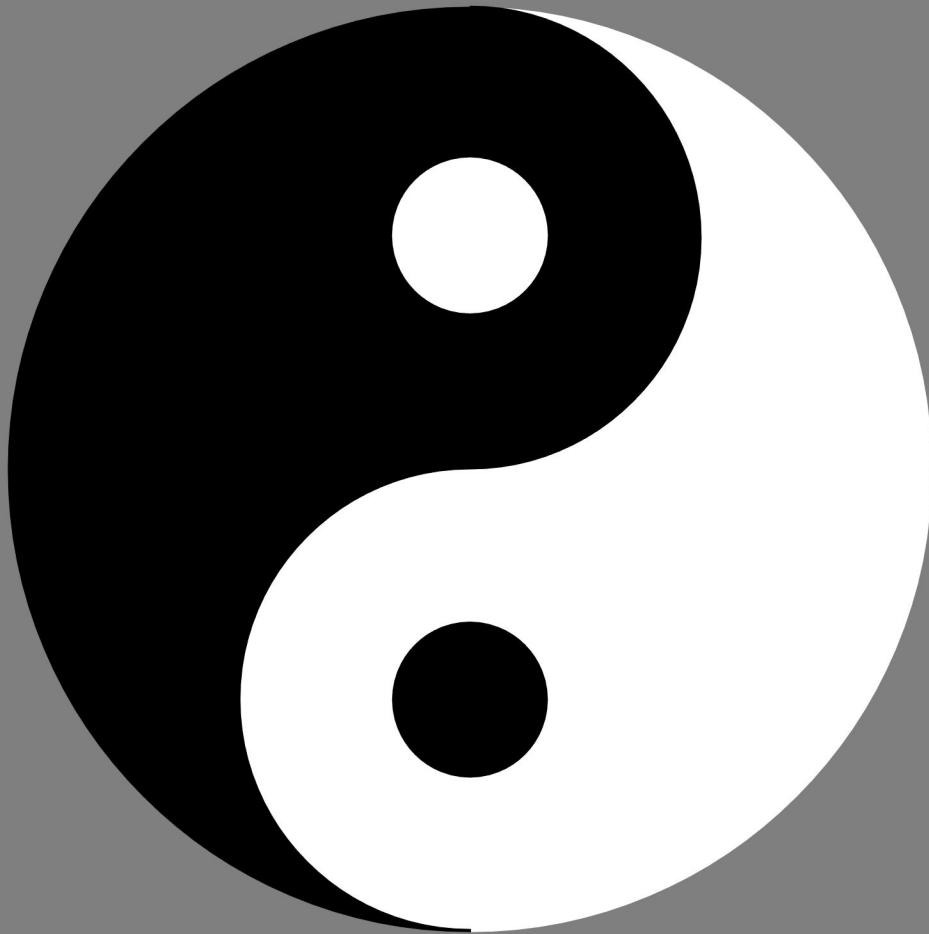


```
<!doctype html>
<html>
  <head>...</head>
  <body>
    <div class="main-container">
      <!-- this is the code copied from illustrator -->
      <div class="svg">
        <!-- this is the yin curve -->
        <svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 450 450" enable-background="new 0 0 450 450" xml:space="preserve">
          <!-- this is the yang curve -->
          <path class="styling" id="curve1" fill="#FFFFFF" stroke="#000000" stroke-miterlimit="10" d="M225,7.9c59.6,0,108,48.4,108,108s-48.4,108-108,108s-108,48.4-108,48.4"/>
        </svg>
      </div>
    </div>
  </body>
</html>
```

stroke-dasharray: 2000;

[9] Adjust animation until satisfaction

Adjust the stroke-dasharray value
in your CSS file



And that's it!