Week 8 - Using External Libraries & Building a GUI

VA345 Creative Coding

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I am an artist and educator based in New York City. I create artwork with code, and focus on building experimental drawing and animation tools. I make interactive environments that invite participants to become performers. My main focus is how computation can be used as medium for poetry.

Using Libraries

A p5.js library can be any JavaScript code that extends or adds to the p5.js core functionality. There are two categories of libraries. Core libraries (p5.sound) are part of the p5.js distribution, while contributed libraries are developed, owned, and maintained by members of the p5.js community.

https://p5js.org/libraries/

Using Libraries

Let's practice with an example

What is we want to save a vector version of our sketch layout? Later we might want to import it to Illustrating Applications

Workflow : Export from p5js as SVG and Import to Adobe Illustrator

Resource: https://github.com/zenozeng/p5.js-svg

Using Libraries - SVG Export

Getting Started

Add this line in your projects index.html :

```html
<script src="https://unpkg.com/p5.js-svg@1.1.1"></script>
```
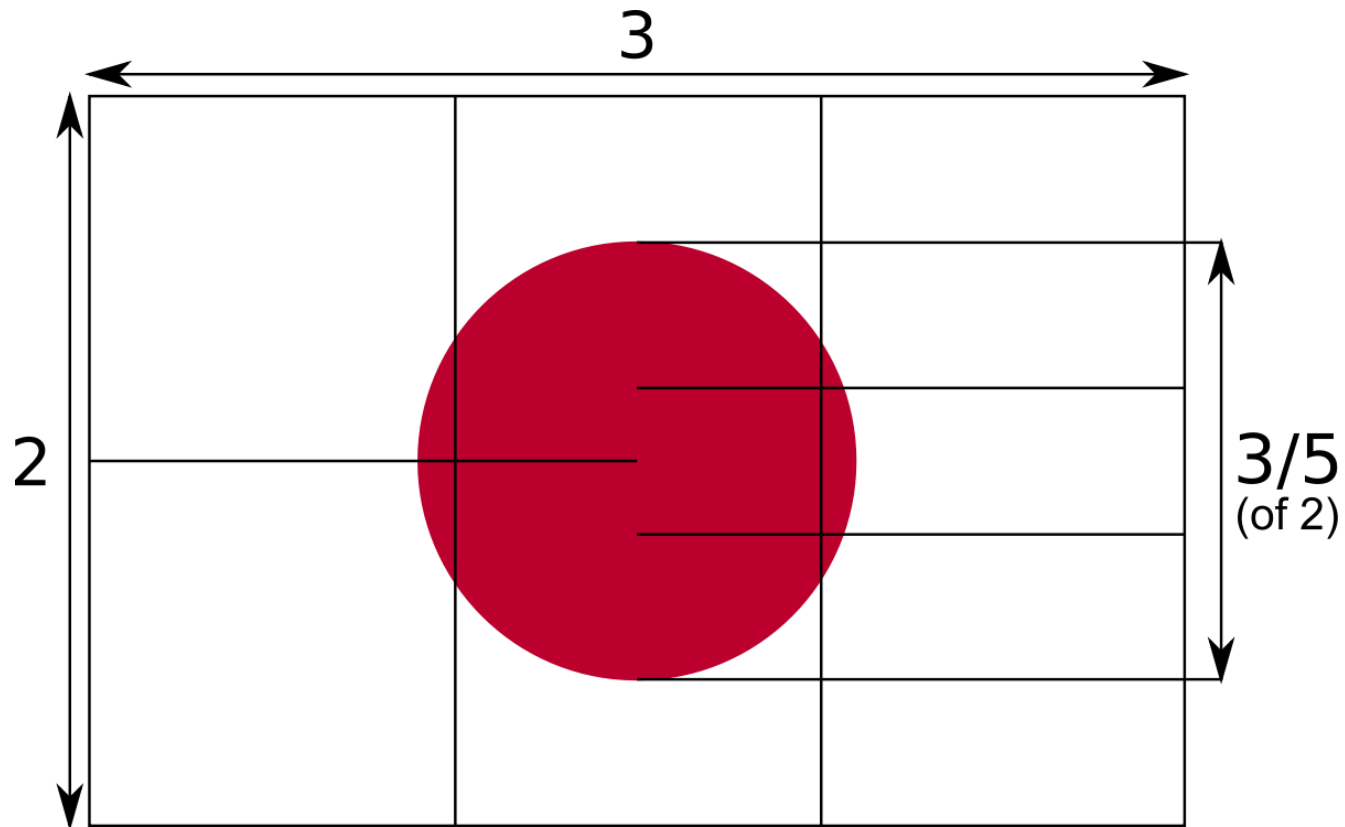
(p5.js-svg v1.1.x is compatible with p5.js v1.4.0)

Open your sketch.js and edit it:

```javascript
function setup() {
    createCanvas(100, 100, SVG);
    background(255);
    fill(150);
    stroke(150);
}

function draw() {
    var r = frameCount % 200 * Math.sqrt(2);
    background(255);
    ellipse(0, 0, r, r);
}
```

Using Libraries Example: Japanese Flag

Let's make a Japanese Flag and export as SVG

GUI

Graphical User Interfaces

The graphical user interface, is a type of user interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation, instead of text-based user interfaces, typed command labels or text navigation. (Wiki)

Designing the visual composition and temporal behavior of a GUI is an important part of software application programming in the area of human–computer interaction.

Its goal is to enhance the efficiency and ease of use for the underlying logical design of a stored program, a design discipline named usability.

Methods of user-centered design are used to ensure that the visual language introduced in the design is well-tailored to the tasks.

Slider Example

```
let slider;
function setup() {
  slider = createSlider(0, 255, 100);
  slider.position(10, 10);
  slider.style('width', '80px');
}

function draw() {
  let val = slider.value();
  background(val);
}
```

Syntax

```
createSlider(min, max, [value], [step])
```

Parameters

|	
min	Number: minimum value of the slider
max	Number: maximum value of the slider
value	Number: default value of the slider (Optional)
step	Number: step size for each tick of the slider (if step is set to 0, the slider will move continuously from the minimum to the maximum value) (Optional)

Free Exploring Time for GUI Elements

https://p5js.org/reference/

Go through the examples

Duration : 10 min

DOM
p5.Element
select()
selectAll()
removeElements()
changed()
input()
createDiv()
createP()
createSpan()
createImg()
createA()
createSlider()
createButton()
createCheckbox()
createSelect()
createRadio()
createColorPicker()
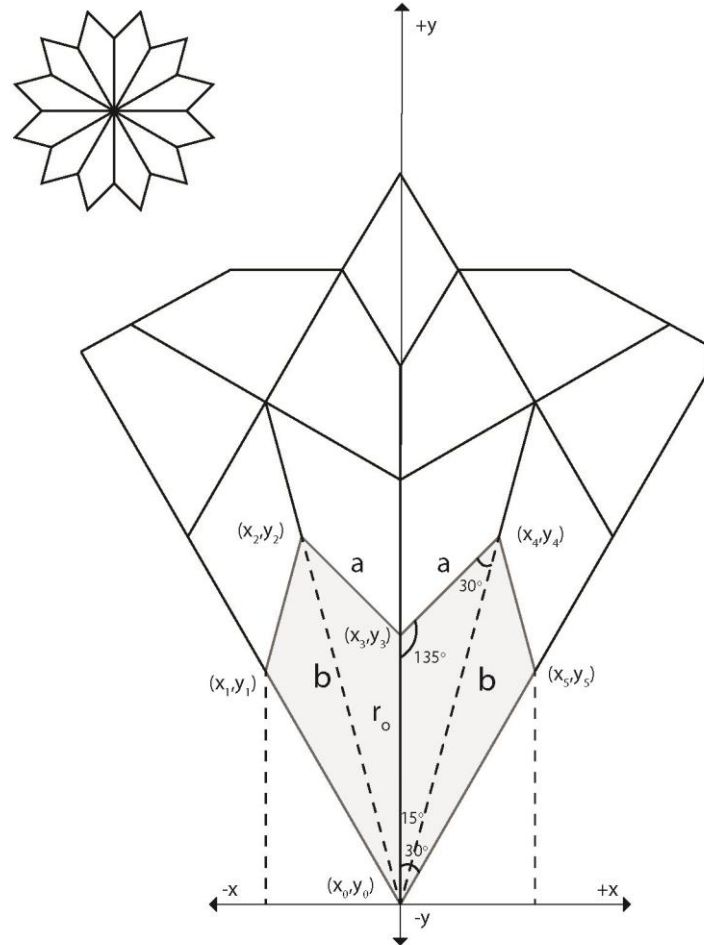createInput()
createFileInput()
createVideo()
createAudio()

Coding a Persian Orosi Glass Islamic Geometric Pattern

Step 1 : Let's breakdown the piece into its construction shapes and analyze the angles
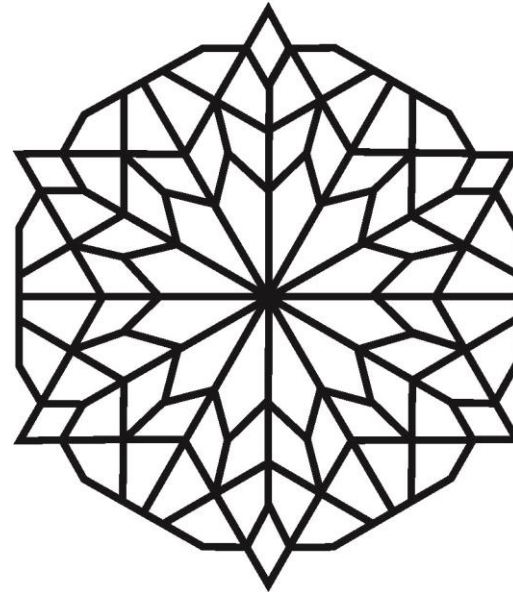
Coding a Persian Orosi Glass Islamic Geometric Pattern

Step 2 : Start with the twelve petal flower at the center

Coding a Persian Orosi Glass Islamic Geometric Pattern

Step 3 : Find vertex points, then close the shape

$a = r_0 x \, (\sin 15° / \sin 30°)$

$b = a x \, (\sin 135° / \sin 15°)$

$$\frac{r_0}{\sin 30°} = \frac{a}{\sin 15°}$$

$x_0 = 0$

$y_0 = 0$

$x_1 = -r_0 x \cos 60°$

$y_1 = r_0 x \sin 60°$

$x_2 = -b x \cos 75°$

$y_2 = b x \sin 75°$

$$\frac{a}{\sin 15°} = \frac{b}{\sin 135°}$$

$x_3 = 0$

$y_3 = r_0$

$x_4 = b x \cos 75°$

$y_4 = b x \sin 75°$

$x_5 = r_0 x \cos 60°$

$y_5 = r_0 x \sin 60°$

```
let a = r * sin(15) / sin(30);
let b = a * sin(135) / sin(15);


for (let i = 0; i < 6; i++) {
        push();
        rotate(60*i);
        beginShape();
        vertex(0, 0); //x0,y0
        vertex(-r * cos(60), r * sin(60)); //x1,y1
        vertex(-b * cos(75), b * sin(75)); //x2,y2
        vertex(0, -r); //x3,y3
        vertex(b * cos(75), b * sin(75)); //x4,y4
        vertex(r * cos(60), r * sin(60)); //x5,y5
        vertex(0, 0); //x0,y0
        vertex(0, -r); //x3,y3
        endShape();
        pop();
}
```

Coding a Persian Orosi Glass Islamic Geometric Pattern

Step 4 : Lets draw the attached shape