CART 253
Creative Computation 1

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Office Hours: Tuesday 12-1
Course Github: https://github.com/LeeRobot/CART253-F-22

What we'll be doing today

- Learn about libraries
- Library exercise
- Share your work

Software Rube Goldberg due week 12

- A rube goldberg machine uses one element to trigger another. Usually they are physical, but we will make a software version! Heres an example of a physical rube goldberg machine.

Software Rube Goldberg due week 12

- The goal of this project is to pass along a variable between programs to create a chain. Every person will get a number from someone else, use this number to create a piece of generative art, then pass along a new number to the next person. You must use MQTT to pass a variable.

Software Rube Goldberg due week 12

- Your piece can be ANYTHING: Audio, Visual, interactive, it can use a camera, it can use external data, particle systems, drawing, physical interactions, etc. Your work should be complex and show the skills we learned throughout the semester and things you've explored on your own.

Software Rube Goldberg due week 12

- Your project must:
  - Use **MQTT** protocol to send/receive messages
  - **Receive** a variable from another person
  - **Use** the variable as a factor in creating a visual, auditory, and/or interactive work.
  - **Change** the variable in some way
  - **Send** the variable successfully to the next person
  - **Successfully** complete this task during critique

Software Rube Goldberg due week 12

- Grading criteria:
  - Successfully receiving / changing / using / sending your variables
  - Using 1 external library for p5js in a meaningful capacity
  - Creativity and application
  - Complexity of code

Software Rube Goldberg due week 12

- Sign up: https://docs.google.com/spreadsheets/d/1CKbdBV9WpNAnygMrTLB8C4OHMg2SJD9eVuOk-nyH7v8/edit#gid=0

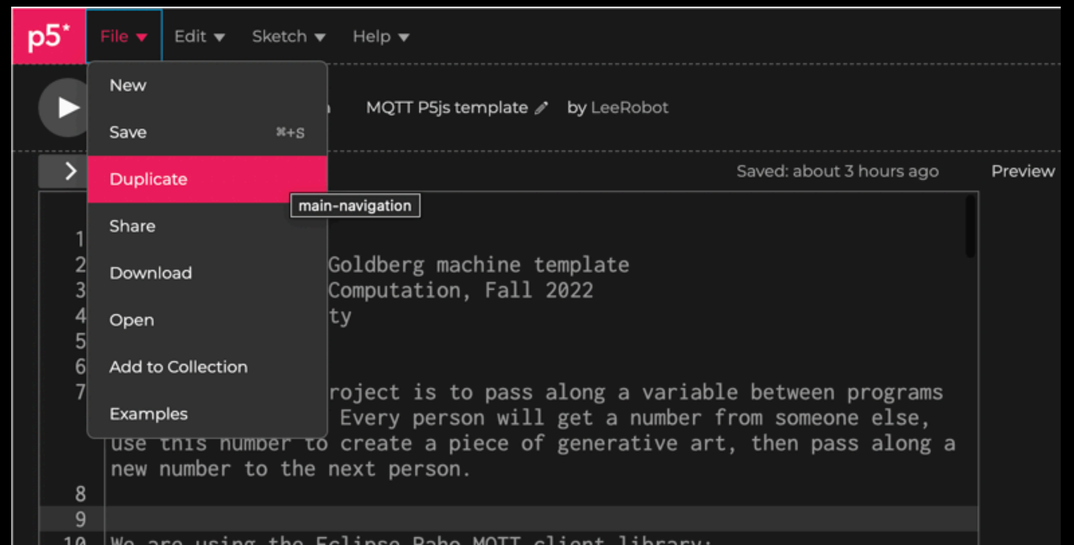
  Lee should be first, Enric should be last.

Template for project

- Find the template HERE https://editor.p5js.org/LeeRobot/sketches/RXA5yGasr

- Duplicate the template and save it!

- You can use the browser for this assignment, bu tyou can also use Atom if you want.



A library is a piece of code that facilities a particular functionality. All libraries are made out of code like we write, and you can look at the code inside any library! Libraries can make it easier to draw certain things, access certain functionality, or achieve a specific aesthetic. Libraries usually have a documentation page that tells you how to use them.

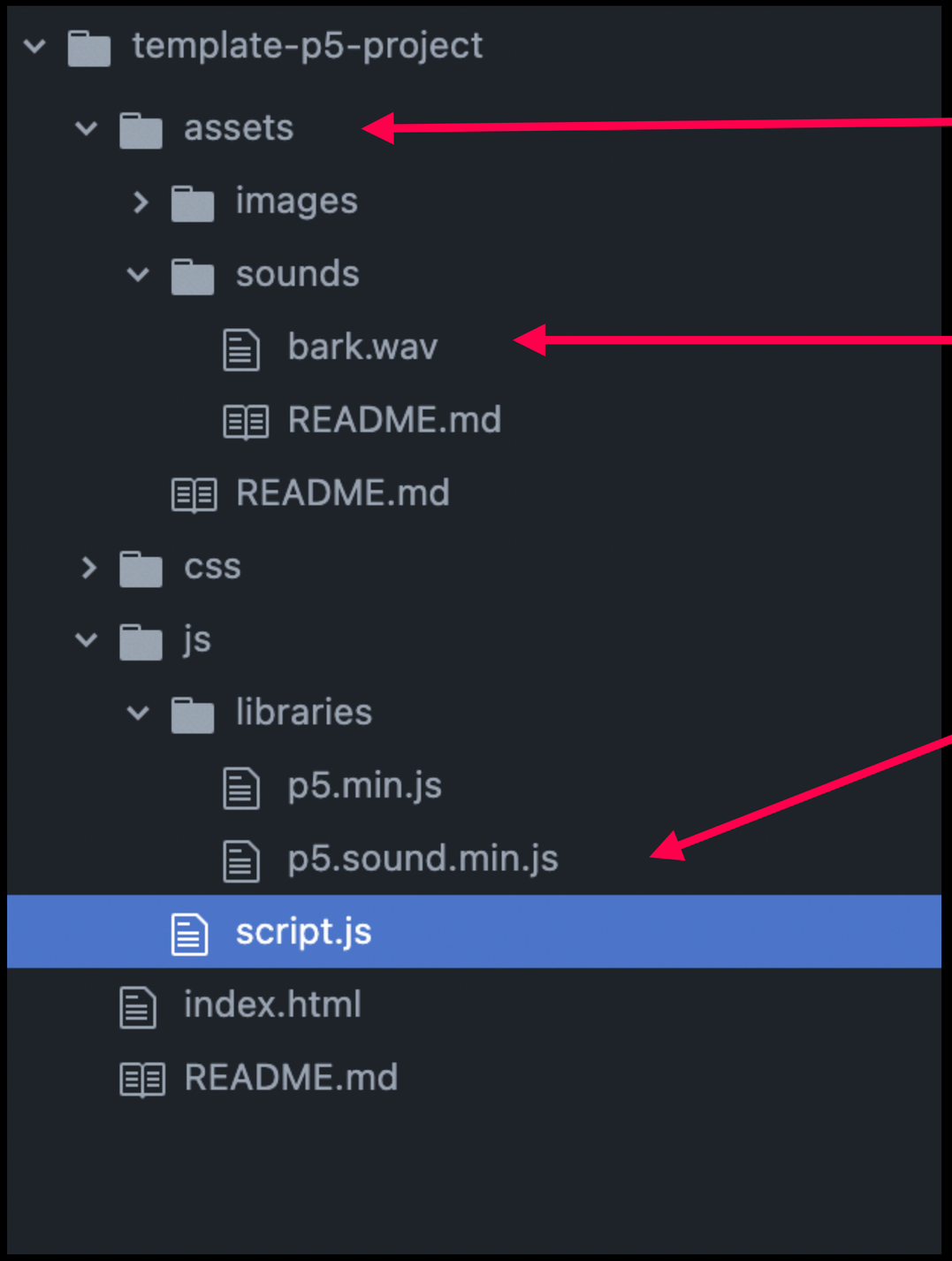
Heres a list of p5 libraries https://p5js.org/libraries/

Libraries

The p5js sound library is ‘core’, meaning it is standard with most downloads of P5JS and is maintained by the creators. Other libraries are made by community members, you can make libraries too!

Here is the reference: https://p5js.org/reference/#/libraries/p5.sound

P5js Sound

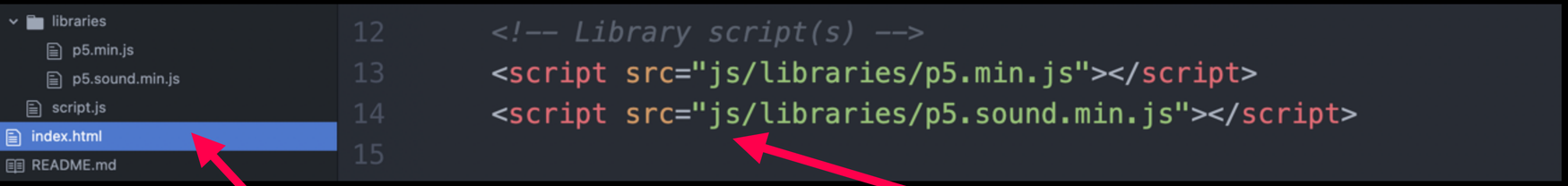


Our assets folder holds any extra things we might need, like pictures, sounds, data, etc.

For our sound library, we need a sound file. Its under assets/sounds

Your library is included here under js/libraries. It is a js file!

Look at your files, lets use sound!



You can link the file path like this, or load it from a URL online

In your HTML file, you'll need to add the library

Load the library

```
let mySound;

function preload() {
  mySound = loadSound('assets/sounds/bark.wav');
}
function setup() {
  createCanvas(100, 100);
  background(220);
}

function mousePressed() {
  mySound.play();
}
```

Create a variable to hold your sound file. This could be named anything, so choose something meaningful

Use loadSound to assign the variable to the sound file. loadSound is a function that is written inside the library, so you can't use it unless the file is attached.

mySound is your variable .play() is a method acting on it to play the sound.

Play an sound

```
let mySound;

function preload() {
  mySound = loadSound('assets/sounds/bark.wav');
  reverb = new p5.Reverb();
}
function setup() {
  createCanvas(100, 100);
  background(220);
}

function mousePressed() {
  mySound.play();
}

function keyPressed(){
  reverb.process(mySound, 9, 2);
}
```

Create a new “reverb” object. This is a tool that lets us reverb!

Call a function to process the reverb. It uses the sound object, the number of seconds of reverb, and the decay rate. You can play with these variables!

See more here https://p5js.org/reference/#/p5.Reverb

Add Reverb

Oscilator

```
let osc, playing, freq, amp;

function setup() {
  createCanvas(100, 100);
  osc = new p5.Oscillator('sine');
}
function draw() {
  background(220)
  freq = map(mouseX, 0, width, 100, 500)
  amp = map(mouseY, height, 0, 0, 1)
  text('tap to play', 20, 20);
  text('freq: ' + freq, 20, 40);
  text('amp: ' + amp, 20, 60);
  if (playing) {
    osc.freq(freq, 0.1);
    osc.amp(amp, 0.1);
  }
}
function mousePressed() {
  osc.start();
  playing = true;
}
function mouseReleased() {
  // ramp amplitude to 0 over 0.5 seconds
  osc.amp(0, 0.5);
  playing = false;
}
```

Details: https://p5js.org/reference/#/p5.Oscillator

Create a new oscillator object, its type is “sine” but you can try “square” or “sawtooth”

Create variables using the mouse X and mouse Y position

If mouse is pressed, play. If the mouse is released, stop playing.

```
amp = map(mouseY, height, 0, 0, 1)
```

Map is a function used to re-map a range of values from one range to another. More here: https://p5js.org/reference/#/p5/map

Map is really useful if you have a number like Mouse Position, which chan have a large range, and you would like it to represent a different range proportional, like an amplitude value which should be between 0 and 1.

map(Value, LowestInitialValue, HighestInitialNumber, LowestDesiredValue, HigestDesiredValue)

This makes function takes mouseY, which is between 0 and height, and maps it to a value between 0 and 1.

Map

Pick any p5js library from here https://p5js.org/libraries, and experiment! We will all share what we learned with the class in 45 minutes. Feel free to work in teams!

Tips:
Find a library you understand! Some might be complex or not useful to you.

Load an example first, try and get it working

Read the documentation. Look over what it can do!

Try and edit an example, play with variables and shapes.

Try to make something new with the code.

Google other examples of people using the library

In Class Workshop