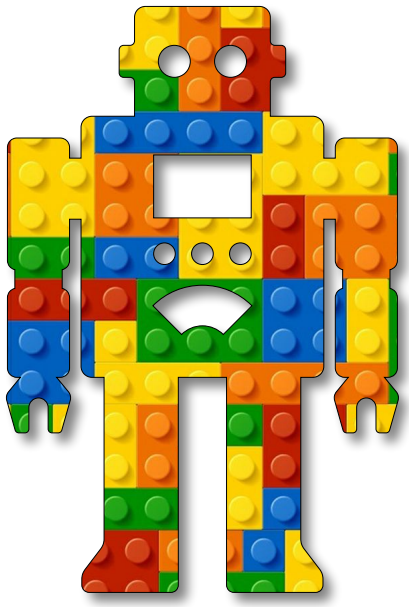
Intelligent Machines Module E Unit #2 slider servo



Content

Module E Unit 2 slider servo

Introduction to slider servo

We are going to connect our Arduino Nano 33 BLE with p5.js. From there, we will control the servo with a slider.

Sketch E2.1 reading a value

Here we will be sending a value (val) through the serial connection with a p5.js sketch.

Arduino sketch

```
#include <Servo.h>
Servo myServo;
int val = 0;

void setup()
{
  myServo.attach(2);
  Serial.begin(9600);
}

void loop()
{
  if (Serial.available() > 0)
  {
    val = Serial.read();
    myServo.write(val);
  }
}
```

🗒️ Notes

The Arduino is in listening mode, waiting for a value (val) to be sent from p5.js.

Sketch E2.2 the port sketch

Make sure that you have everything in the port.js sketch.

port.js

```
const serial = new p5.WebSerial()
let portButton

function navigation()
{
  if (!navigator.serial)
  {
    alert ("WebSerial is not supported. Try Chrome")
  }
  serial.getPorts()
  serial.on("noport", makePortButton)
  serial.on("portavailable", openPort)
  serial.on("requesterror", portError)
  serial.on("close", makePortButton)
}

function makePortButton()
{
  portButton = createButton("choose port")
  portButton.position(10, 10)
  portButton.mousePressed(choosePort)
}

function choosePort()
{
  if (portButton) portButton.show()
  serial.requestPort()
}

function openPort()
{
  serial.open().then(initiateSerial)
  function initiateSerial()
```

```
  {
    console.log("port open")
    if (portButton) portButton.hide()
  }
}

function portError(err)
{
  alert("Serial port error: " + err)
}

function portConnect()
{
  console.log("port connected")
  serial.getPorts()
}

function portDisconnect()
{
  serial.close()
  console.log("port disconnected")
}

function closePort()
{
  serial.close()
}
```

🗒️ Notes

There is nothing new here.

Sketch E2.3 the main sketch

❗ In sketch.js.
Starting with a fairly basic sketch. We have a slider (remember the LED unit?).

sketch.js

```
let slider

function setup()
{
  createCanvas(400, 400)
  slider = createSlider(0, 180, 0)
  navigation()
}

function draw()
{
  background(220)
}
```

🗒️ Notes

The slider doesn't do anything yet, we have not attached any functionality to it yet.

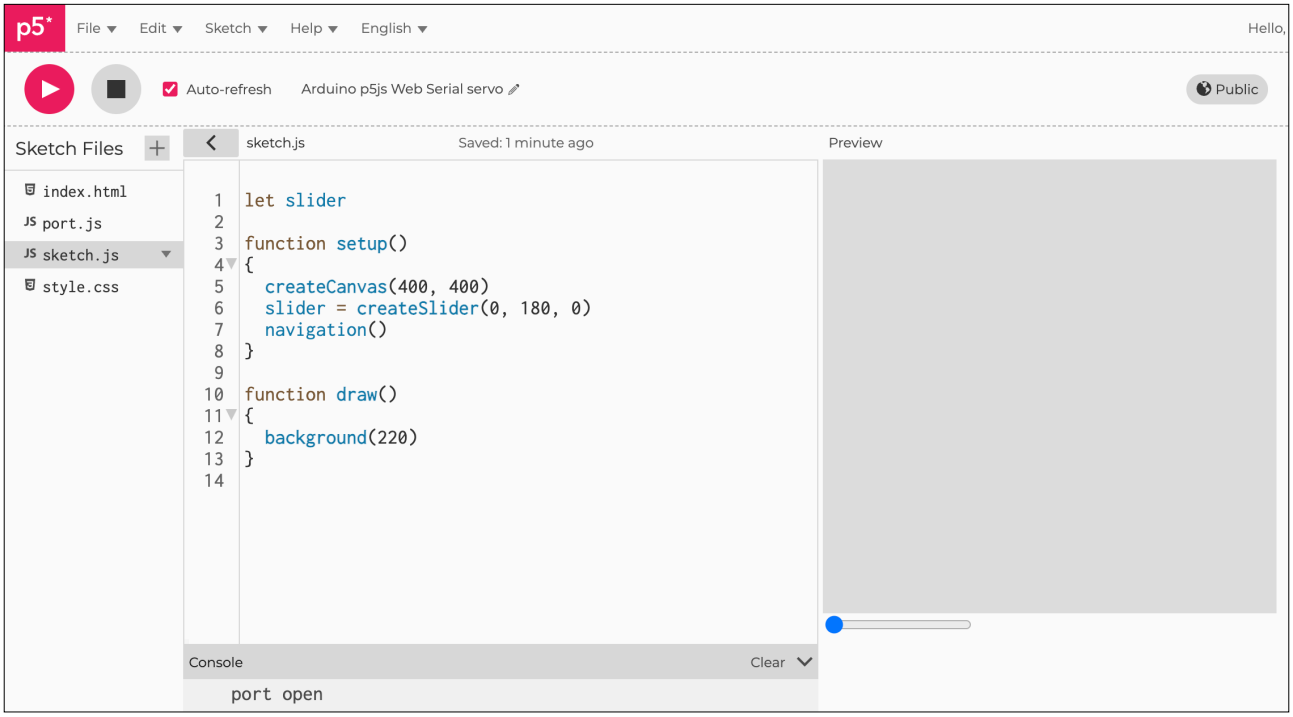
🌻 Challenge

You could place the slider on the canvas.

🛠️ Code Explanation

`slider = createSlider(0, 180, 0)`	Creating a slider with value range of 0-180 and a starting value of zero.

Figure E2.3


p5*
File
Edit
Sketch
Help
English
Hello,
Auto-refresh
Arduino p5js Web Serial servo
Public
Sketch Files
index.html
port.js
sketch.js
style.css
sketch.js
Saved: 1 minute ago
Preview
let slider
function setup()
{
createCanvas(400, 400)
slider = createSlider(0, 180, 0)
navigation()
}
function draw()
{
background(220)
}
Console
Clear
port open

Sketch E2.4 attaching a value

We want to send the value of the slider to the Arduino Nano 33 BLE.

sketch.js

```
let slider
let val

function setup()
{
  createCanvas(400, 400)
  slider = createSlider(0, 180, 0)
  navigation()
}

function draw()
{
  background(220)
  val = slider.value()
  serial.write(val)
}
```

🗒️ Notes

When you slide the slider you should see the servo copy the movement from 0° to 180°.

🛠️ Code Explanation

`val = slider.value()`	Receives the value from the slider
`serial.write(val)`	Sends the value from the slider to the Arduino.

Sketch E2.5 drawing the servo arm

Rather than draw the whole thing I have just drawn the rotating arm showing that you can display the movement graphically, also have added the value as text.

sketch.js

```
let slider
let val

function setup()
{
  createCanvas(400, 400)
  slider = createSlider(0, 180, 0)
  navigation()
  angleMode(DEGREES)
}

function draw()
{
  background('darkred')
  val = slider.value()
  serial.write(val)
  translate(width/2, height/2)
  strokeWeight(20)
  stroke('yellow')
  line(0, 0, 100 * sin(val), 100 * cos(val))
  textSize(30)
  noStroke()
  fill('yellow')
  text('angle: ' + val, -150, -150)
}
```

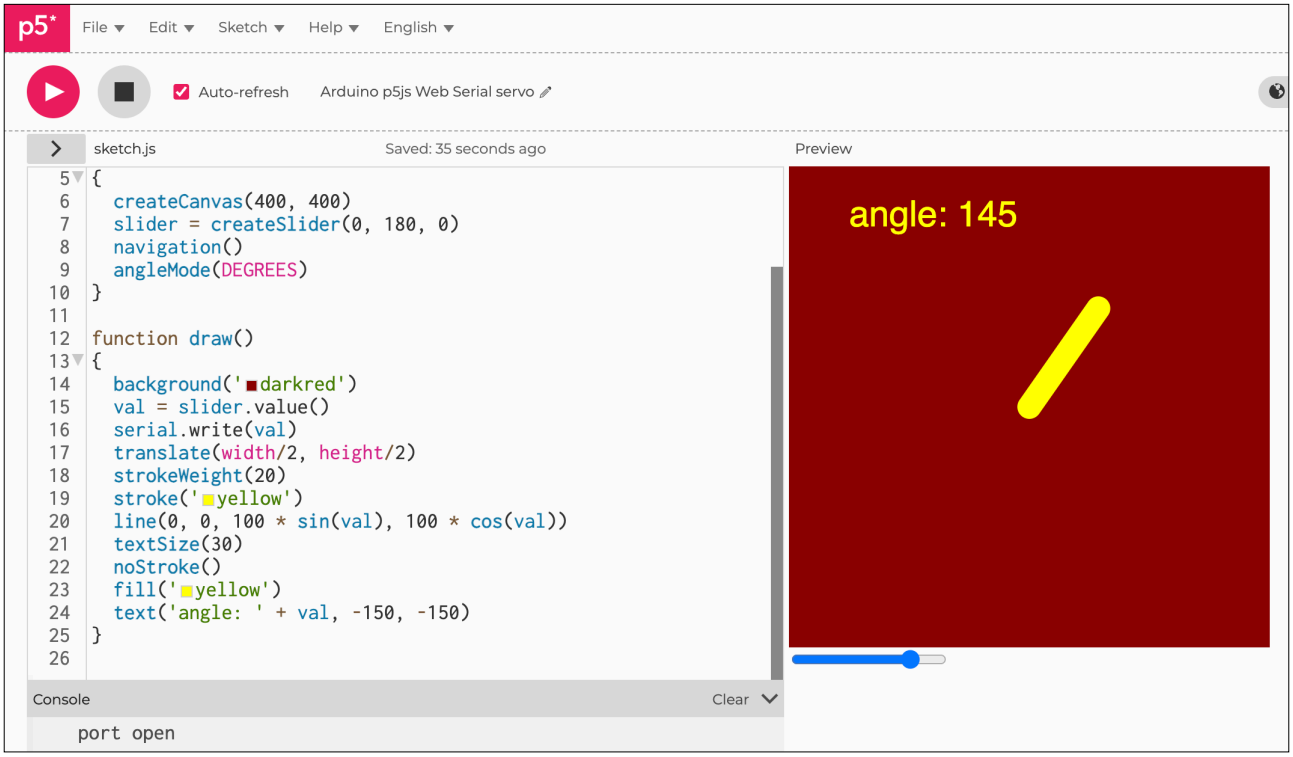
🗒️ Notes

The arm follows the slider and the servo.

🌻 Challenge

1. Draw the rest of the servo.
2. Draw it in 3D.

Figure E2.6


p5*
File
Edit
Sketch
Help
English
Auto-refresh
Arduino p5js Web Serial servo
sketch.js
Saved: 35 seconds ago
Preview
5 {
6 createCanvas(400, 400)
7 slider = createSlider(0, 180, 0)
8 navigation()
9 angleMode(DEGREES)
10 }
11
12 function draw()
13 {
14 background('darkred')
15 val = slider.value()
16 serial.write(val)
17 translate(width/2, height/2)
18 strokeWeight(20)
19 stroke('yellow')
20 line(0, 0, 100 * sin(val), 100 * cos(val))
21 textSize(30)
22 noStroke()
23 fill('yellow')
24 text('angle: ' + val, -150, -150)
25 }
26
angle: 145
Console
Clear
port open