

- Code done in [main.js](#) file in previous class.

```
song = "";

function preload()
{
  song = loadSound("music.mp3");
}

rightWristX = 0;
rightWristY = 0;

leftWristX = 0;
leftWristY = 0;

function setup() {
  canvas = createCanvas(600, 500);
  canvas.center();

  video = createCapture(VIDEO);
  video.hide();

  poseNet = ml5.poseNet(video, modelLoaded);
  poseNet.on('pose', gotPoses);
}

function modelLoaded() {
  console.log('PoseNet Is Initialized');
}

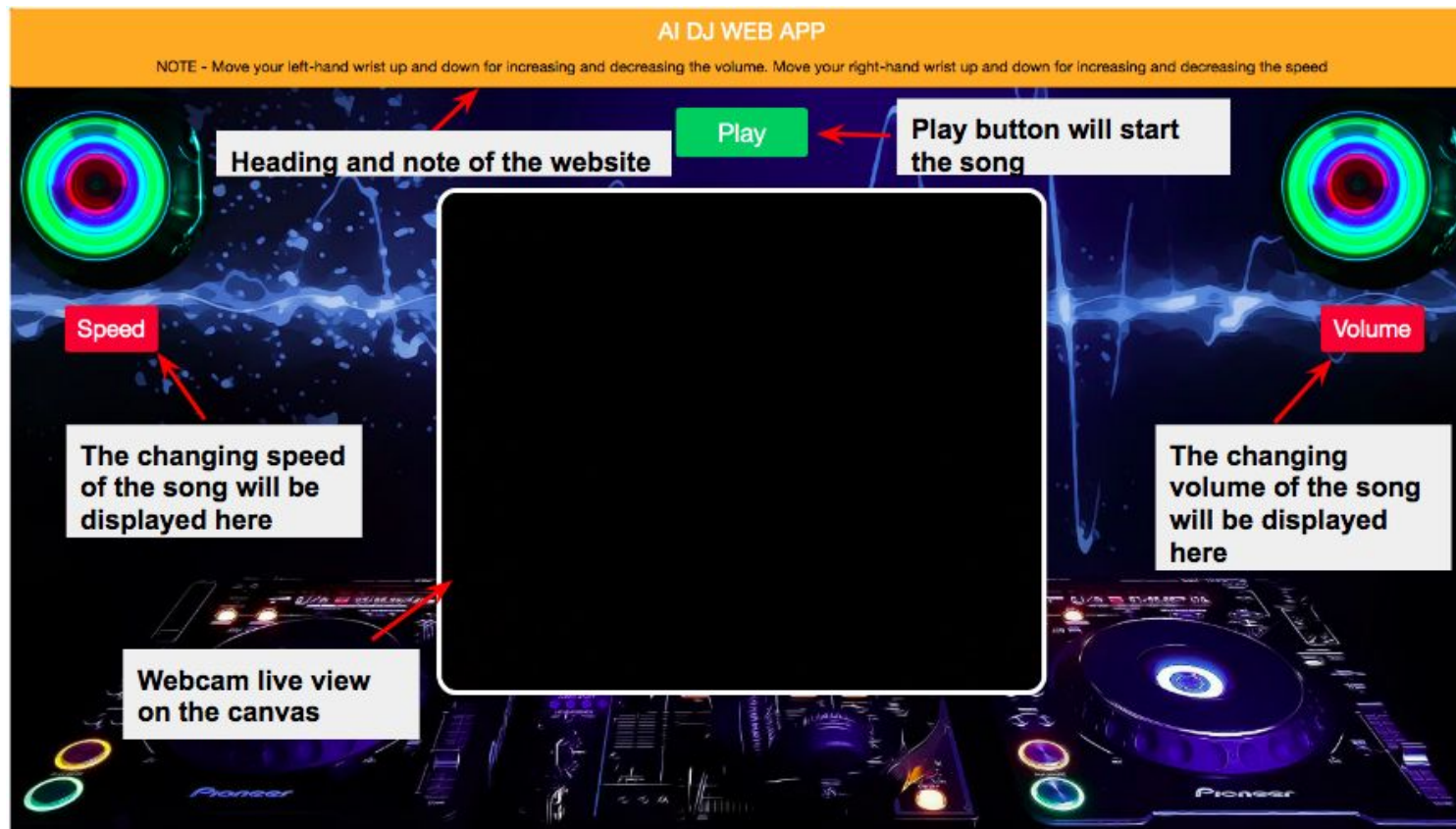
function gotPoses(results)
{
  if(results.length > 0)
  {
    rightWristX = results[0].pose.rightWrist.x;
    rightWristY = results[0].pose.rightWrist.y;
    console.log("rightWristX = " + rightWristX + " rightWristY = " + rightWristY);

    leftWristX = results[0].pose.leftWrist.x;
    leftWristY = results[0].pose.leftWrist.y;
    console.log("leftWristX = " + leftWristX + " leftWristY = " + leftWristY);
  }
}

function draw() {
  image(video, 0, 0, 600, 500);
}

function play()
{
  song.play();
  song.setVolume(1);
  song.rate(1);
}
```

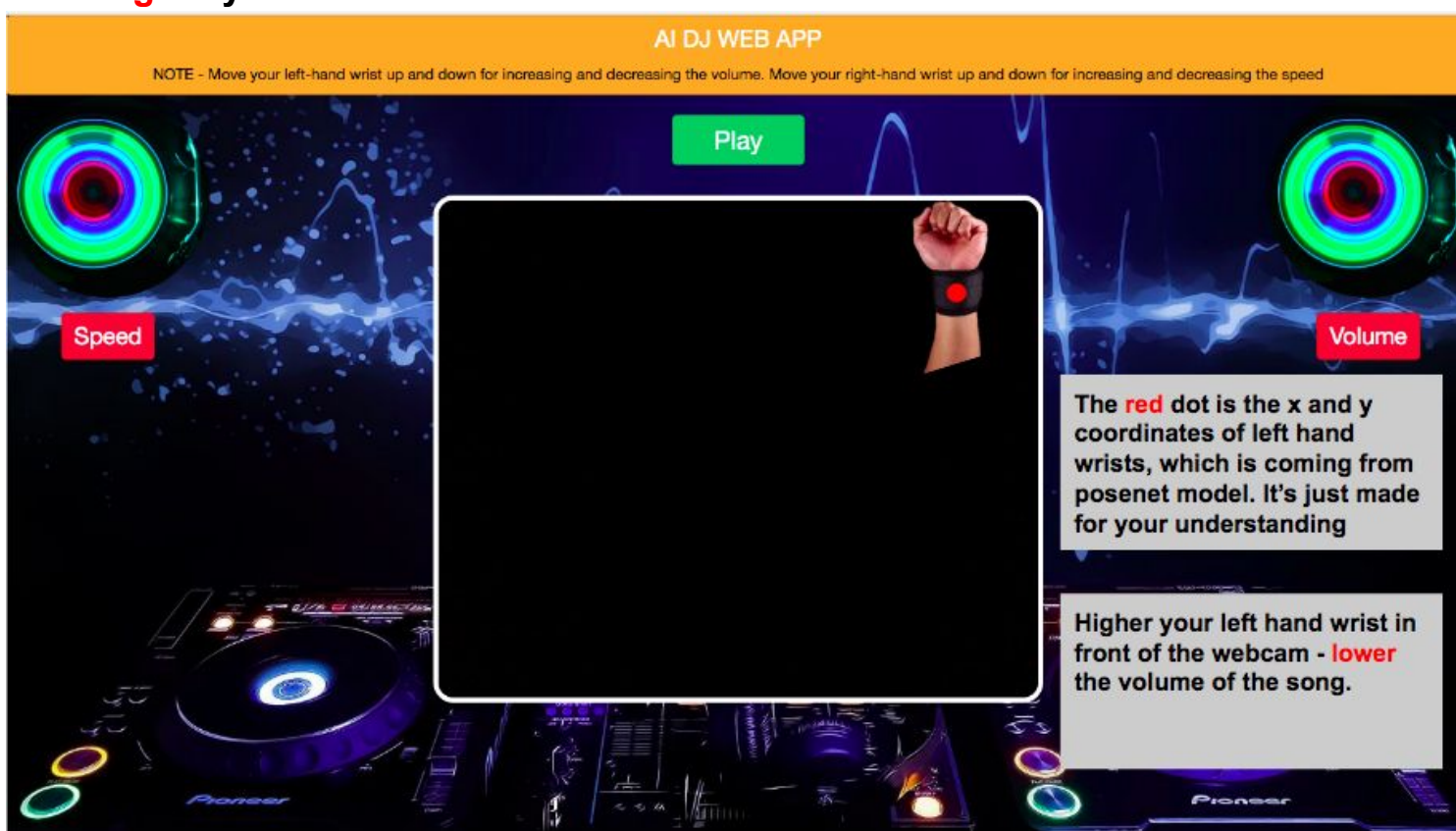
- UI overview



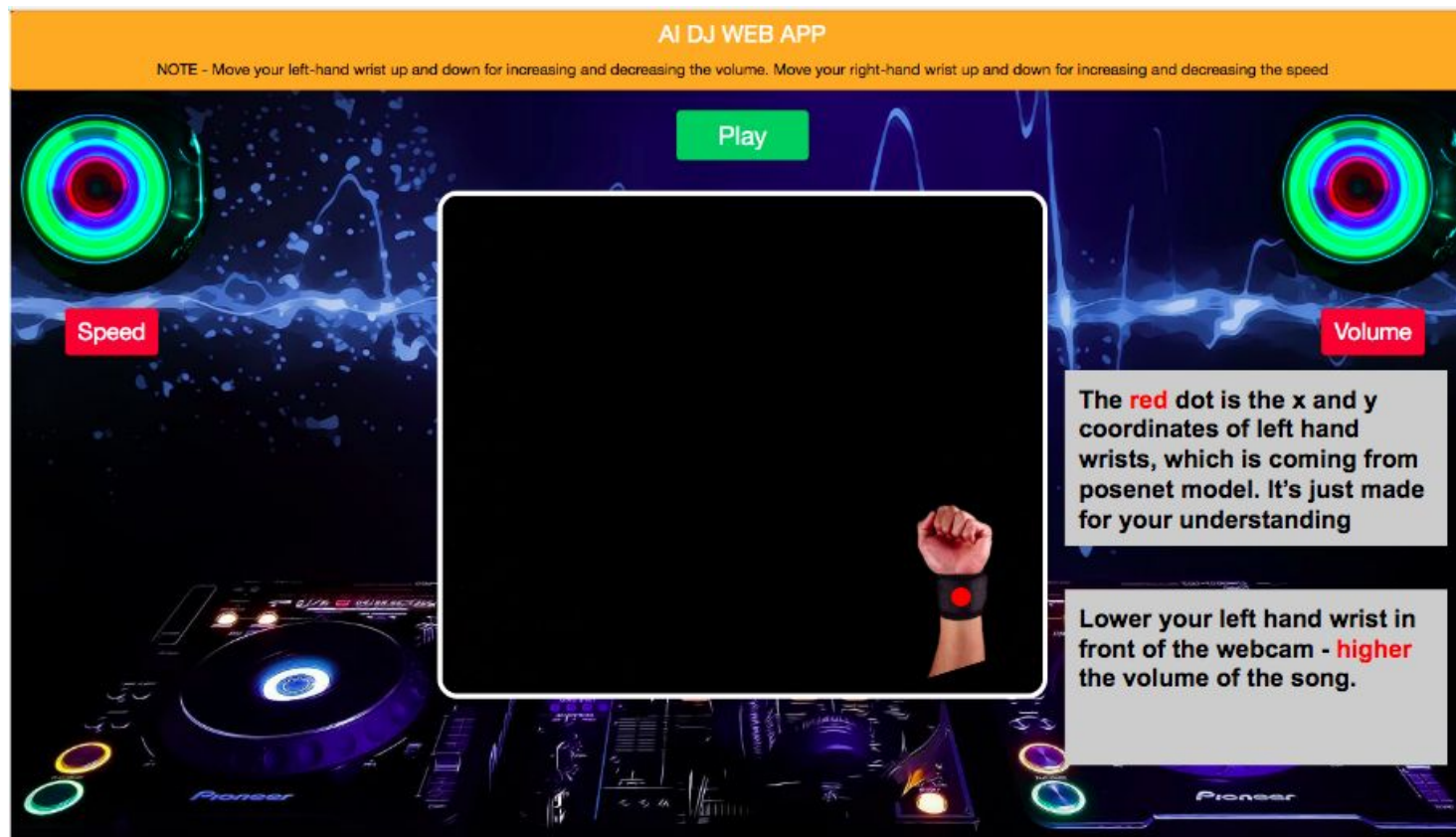
- Now press the play button
- Then it will start playing the song

- Now move your left hand wrist up and down in front of the webcam to change the volume/pace of the song.

Higher your left hand wrist in front of the webcam - **lower** the volume.

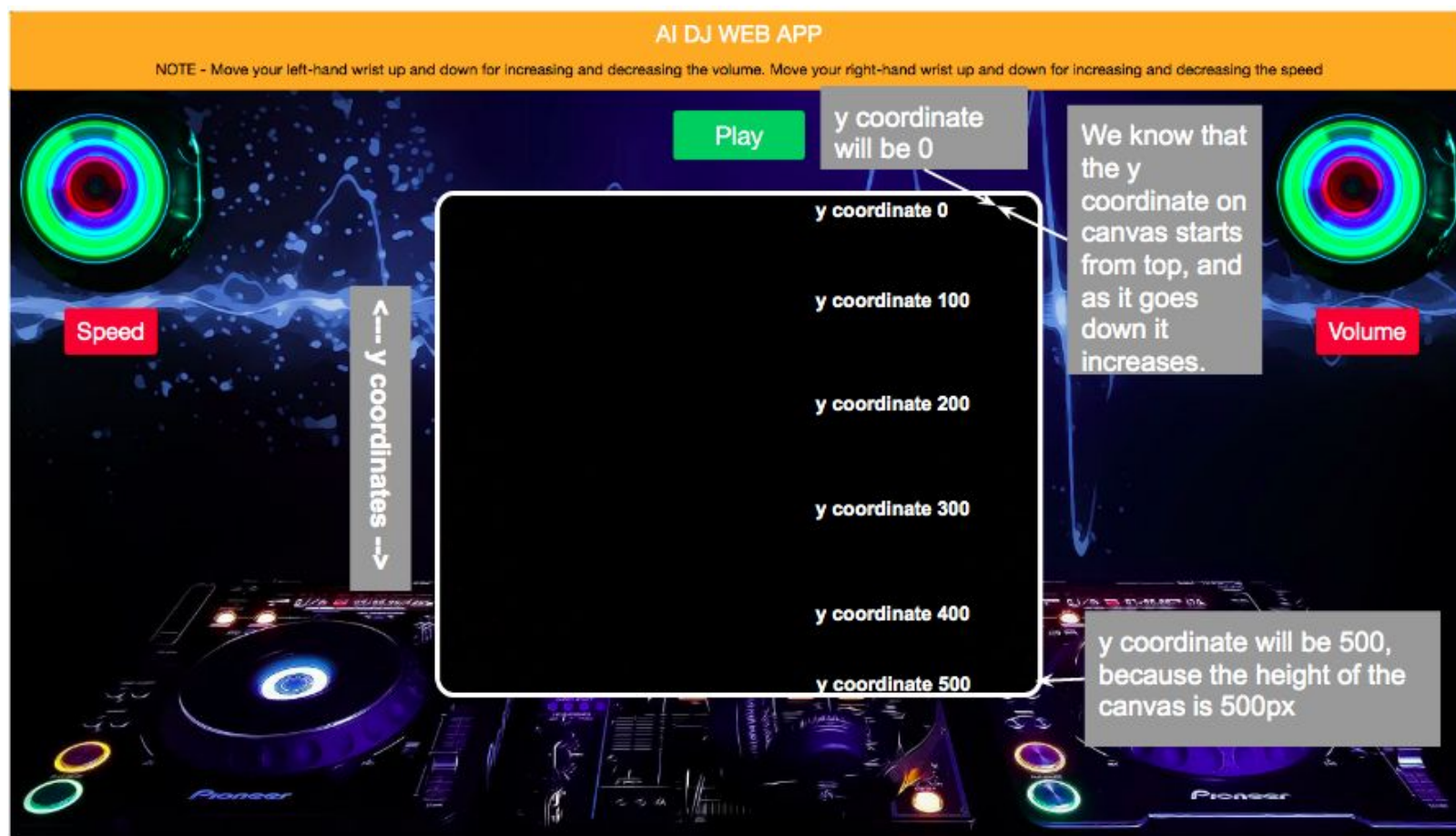


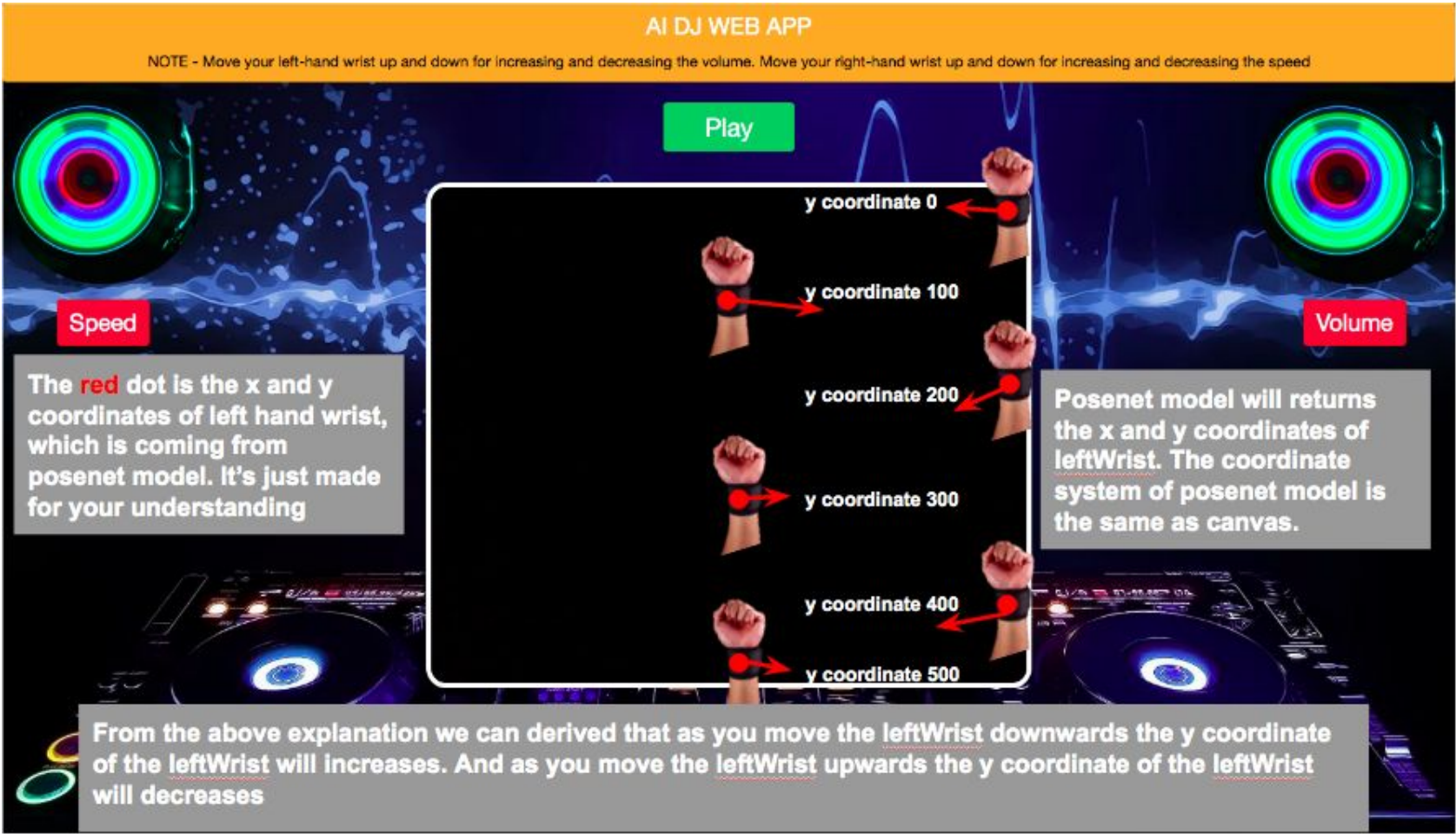
Lower your left hand wrist in front of the webcam - **higher** the volume.



As per the movement of your left hand wrist the volume of the song will change, meaning - as you move your left hand wrist from **up to down** - the volume of the song will change from **lower to higher**.

- Logic for changing the volume for the song

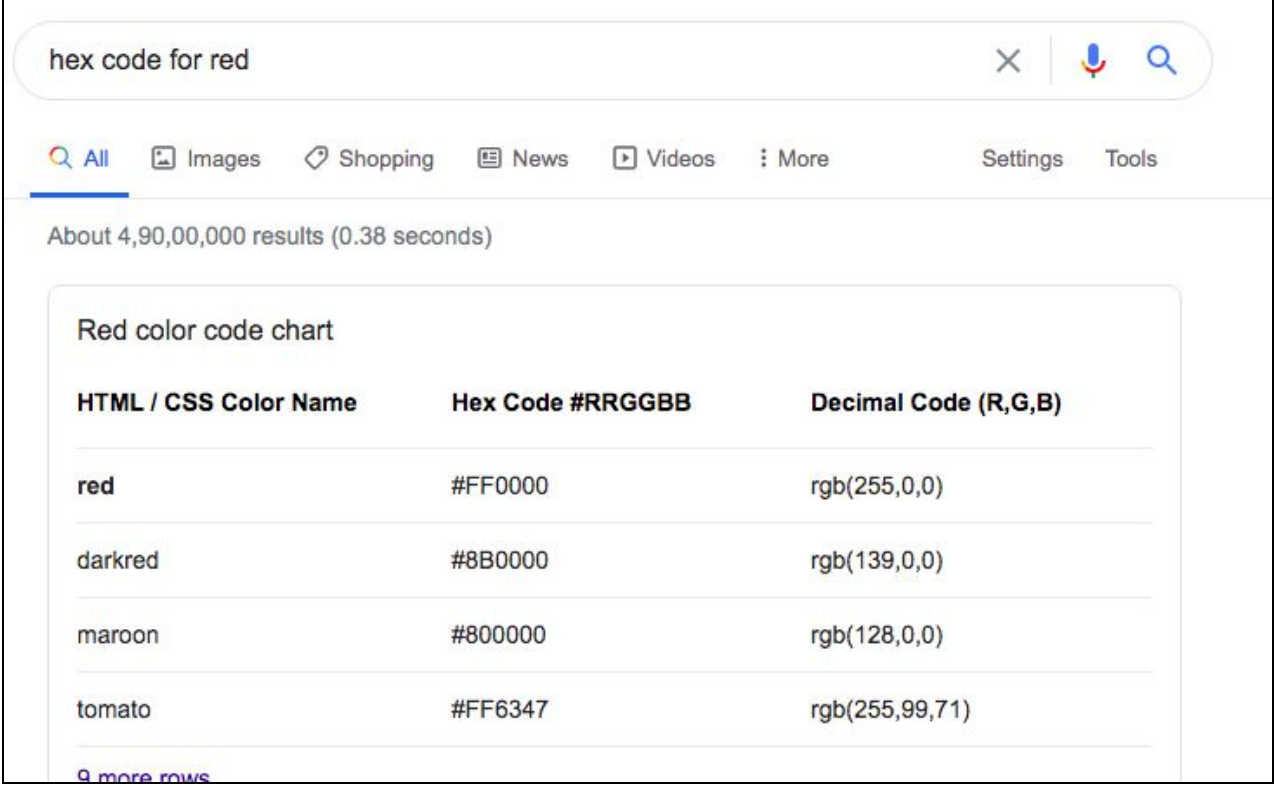




- Adding code to set the color for the circle

```
function draw() {  
  image(video, 0, 0, 600, 500);  
  fill("#FF0000");  
}
```

To get the HEX code of any color just google - “HEX code for color name” for eg -



- Adding code to set the border-color for the circle


```
function draw() {
  image(video, 0, 0, 600, 500);

  fill("#FF0000");
  stroke("#FF0000");
}
```

- Adding code for drawing the circle

```
function draw() {
  image(video, 0, 0, 600, 500);

  fill("#FF0000");
  stroke("#FF0000");

  circle(leftWristX, leftWristY, 20);
}
```

- Math logic -
-

Before we start the math part let's consider y coordinate of leftWrist as **400.345678765** and we will use this number as an example for doing the math.

→ First convert y coordinate of leftWrist to a number - done because if the leftWrist value is a string and if we do math using this leftWrist variable, then we won't get a proper output, so to be on a safer side we will convert this variable into a number.

```
function draw() {
  image(video, 0, 0, 600, 500);

  fill("#FF0000");
  stroke("#FF0000");

  circle(leftWristX, leftWristY, 20);
  InNumberleftWristY = Number(leftWristY);
}
```

- As we considered to use this - **400.345678765** number as an example, so after applying the Number() function to the leftWrist variable we get a value **400.345678765** and store this value in the InNumberleftWristY variable.

→ Remove decimals - done because - y coordinate of leftWrist have a lots of decimals

```
▶ leftWrist: {x: 263.52472737518667, y: 400.345678765}
```

So when we will do some calculation on y coordinate of leftWrist we will get a result which will have a lot of decimals. And we don't want it that's why removing the decimals.

```
function draw() {
  image(video, 0, 0, 600, 500);

  fill("#FF0000");
  stroke("#FF0000");

  circle(leftWristX, leftWristY, 20);
  InNumberleftWristY = Number(leftWristY);
  remove_decimals = floor(InNumberleftWristY);
}
```

- As we considered to use this - **400.345678765** number as an example, so after applying floor() to this

number, the value will be 400, and store this value in the remove_decimals variable.

→ Dividing by 500 done because - to get a value between 0 and 1

```
function draw() {  
  image(video, 0, 0, 600, 500);  
  
  fill("#FF0000");  
  stroke("#FF0000");  
  
  circle(leftWristX, leftWristY, 20);  
  InNumberleftWristY = Number(leftWristY);  
  remove_decimals = floor(InNumberleftWristY);  
  volume = remove_decimals/500;  
}
```

- As we considered to use this - 400.345678765 number as an example. And after applying floor() we got a value as 400 and we had stored this value in the remove_decimals variable. Now we will divide remove_decimals variable with 500 and we will get a value as 0.8 and we will stored this value in volume variable

- Now update the h3 tag with this volume variable.

```
function draw() {  
  image(video, 0, 0, 600, 500);  
  
  fill("#FF0000");  
  stroke("#FF0000");  
  
  circle(leftWristX, leftWristY, 20);  
  InNumberleftWristY = Number(leftWristY);  
  remove_decimals = floor(InNumberleftWristY);  
  leftWristY_divide_1000 = remove_decimals/1000;  
  volume = leftWristY_divide_1000 * 2 ;  
  document.getElementById("volume").innerHTML = "Volume = " + volume;  
}
```

- Now pass this volume variable inside setVolume() function

```
function draw() {  
  image(video, 0, 0, 600, 500);  
  
  fill("#FF0000");  
  stroke("#FF0000");  
  
  circle(leftWristX, leftWristY, 20);  
  InNumberleftWristY = Number(leftWristY);  
  remove_decimals = floor(InNumberleftWristY);  
  leftWristY_divide_1000 = remove_decimals/1000;  
  volume = leftWristY_divide_1000 * 2 ;  
  document.getElementById("volume").innerHTML = "Volume = " + volume;  
  song.setVolume(volume);  
}
```

- Reading results to fetch the score

Run <https://mahdihat791.github.io/Ai-DJ/> and open console screen -

```
PoseNet Is Initialized      main.js:17
▶ [{-}]                    main.js:24
```

We need to read this object and fetch the score of the leftWrist, while reading the object we will also write the code -

- First click on the arrow to expand -

```
PoseNet Is Initialized      main.js:17
▶ [{-}]                    main.js:24
```

We want to read the objects of results so first we will write

results

- Then click on the arrow next to **0** to expand -

```
▼ [{-}] 1
▶ 0: {pose: {_-}, skeleton: Array(0)}
  length: 1
  ▶ __proto__: Array(0)
```

We have clicked on 0 index which is inside the "results" object, so code will be

results[0]

- Then click on the arrow next to **pose** to expand -

```
▼ [{-}] 1
  ▼ 0:
    ▶ pose: {score: 0.25857010390866303, keypoints: Array(17)}
      skeleton: []
      ▶ __proto__: Object
      length: 1
      ▶ __proto__: Array(0)
```

Then inside 0 index we have clicked on pose object, so code will be -

results[0].pose

- Then inside the pose object there are the two important parts **keypoints** and 17 body parts with x and y coordinates.

This time we will expand **keypoints** as it has the same thing which is 17 body parts with x and y coordinates. But also it contains the score for each body part.

So click the arrow new to **keypoints** to expand

```
▼ [{-}] 1
  ▼ 0:
    ▼ pose:
      ▶ keypoints: (17) [{-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}, {-}]
      ▶ leftAnkle: {x: 476.95984347754285, y: 557.9741131817852, confidence: 0.006817338988184929}
      ▶ leftEar: {x: 440.8266567951522, y: 279.24962594030427, confidence: 0.9045593571662903}
      ▶ leftElbow: {x: 551.0097719307763, y: 556.1943765086272, confidence: 0.005512693431228399}
      ▶ leftEye: {x: 374.511157476414, y: 252.87427221822458, confidence: 0.9968265295028687}
      ▶ leftHip: {x: 499.0492683358592, y: 555.9596999021534, confidence: 0.012135978780137436}
      ▶ leftKnee: {x: 477.69501208329524, y: 528.5981283503899, confidence: 0.004493321757763624}
      ▶ leftShoulder: {x: 533.6824056465491, y: 449.26871494940144, confidence: 0.2861071825027466}
      ▶ leftWrist: {x: 509.11176952934636, y: 544.3861177976136, confidence: 0.0015677408082410693}
      ▶ nose: {x: 328.5134251168029, y: 309.8290432638127, confidence: 0.9861957430839539}
      ▶ rightAnkle: {x: 258.2626552470246, y: 555.4868089107044, confidence: 0.007420164532959461}
      ▶ rightEar: {x: 253.53315267878098, y: 274.41933258235105, confidence: 0.7130623459815979}
      ▶ rightElbow: {x: 154.06015156992415, y: 553.3531540870004, confidence: 0.002170068444604140}
      ▶ rightEye: {x: 290.602836385805, y: 260.0981614557158, confidence: 0.9987963438034058}
      ▶ rightHip: {x: 221.92330328809354, y: 527.4246174178393, confidence: 0.017803354188799858}
      ▶ rightKnee: {x: 241.3050094217817, y: 537.2992111414264, confidence: 0.009562619030475616}
      ▶ rightShoulder: {x: 166.19060077630056, y: 424.62867067571267, confidence: 0.005944470409303904}
      ▶ rightWrist: {x: 164.9501367758589, y: 514.5395001565736, confidence: 0.0014911155449226499}
      score: 0.2964980216450332
```

If we want to get the score of the leftWrist, so inside results -> inside 0 index -> inside pose -> inside keypoints.

So we will write - **results[0].pose.keypoints**

Inside **keypoints**:

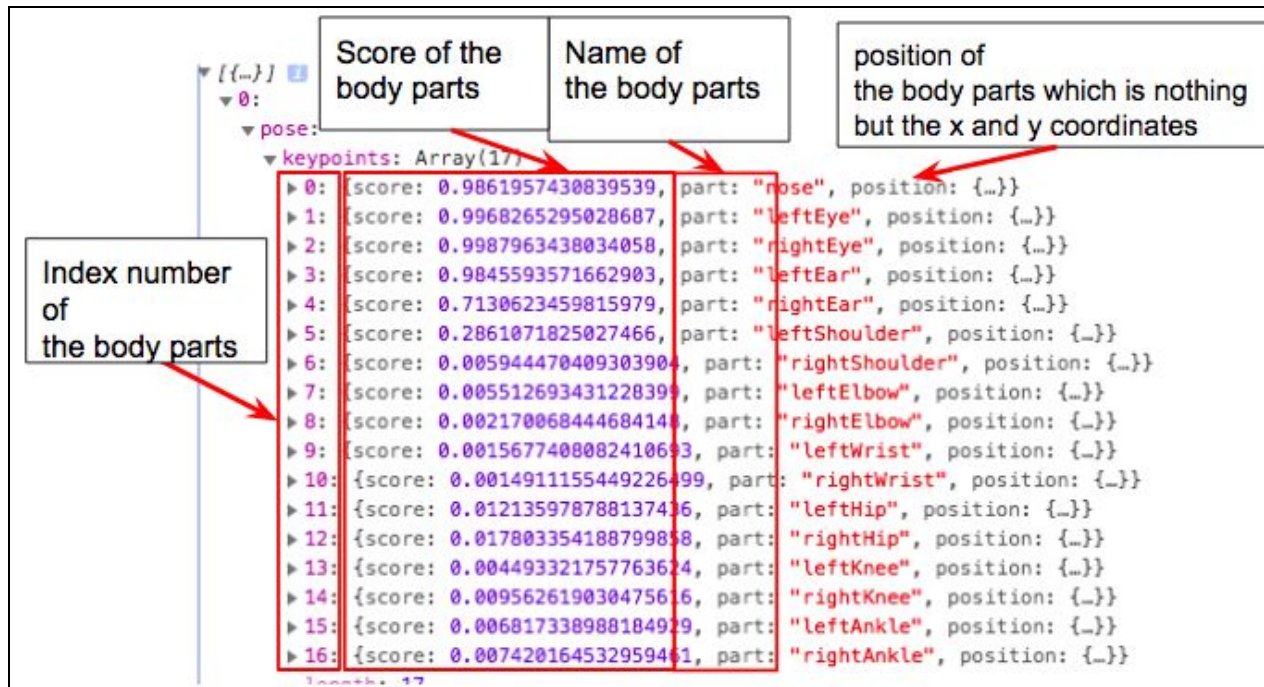
there will -

Index numbers of the body parts

Score for the body parts

Name of the body parts

Position of the body parts - this is nothing but x and y coordinates of the body parts



Now we want to get the score of leftWrist. The index of leftWrist is 9, so **inside results -> inside 0 index -> inside pose -> inside keypoints -> inside 9**.

So the code will be - `results[0].pose.keypoints[9]`

Now we have the index number of leftWrist, so we can get the score inside of leftWrist, so **inside results -> inside 0 index -> inside pose -> inside keypoints -> inside 9 -> there is score**.

So the code will be - `results[0].pose.keypoints[9].score`

- Now add code for fetching score of leftWrist and store it inside a variable.

```

function gotPoses(results)
{
  if(results.length > 0)
  {
    console.log(results);
    scoreLeftWrist = results[0].pose.keypoints[9].score;

    rightWristX = results[0].pose.rightWrist.x;
    rightWristY = results[0].pose.rightWrist.y;
    console.log("rightWristX = " + rightWristX + " rightWristY = " + rightWristY);

    leftWristX = results[0].pose.leftWrist.x;
    leftWristY = results[0].pose.leftWrist.y;
    console.log("leftWristX = " + leftWristX + " leftWristY = " + leftWristY);
  }
}

```

- Code to console this variable.

```

function gotPoses(results)
{
  if(results.length > 0)
  {
    console.log(results);
    scoreLeftWrist = results[0].pose.keypoints[9].score;
    console.log("scoreLeftWrist = " + scoreLeftWrist);

    rightWristX = results[0].pose.rightWrist.x;
    rightWristY = results[0].pose.rightWrist.y;
    console.log("rightWristX = " + rightWristX + " rightWristY = " + rightWristY);

    leftWristX = results[0].pose.leftWrist.x;
    leftWristY = results[0].pose.leftWrist.y;
    console.log("leftWristX = " + leftWristX + " leftWristY = " + leftWristY);
  }
}

```


- Add a if condition to check if scoreLeftWrist is greater than 0.2 then only draw circle and change volume of the song

```
function draw() {  
  image(video, 0, 0, 600, 500);  
  
  fill("#FF0000");  
  stroke("#FF0000");  
  
  if(scoreLeftWrist > 0.2)  
  {  
    circle(leftWristX, leftWristY, 20);  
    InNumberleftWristY = Number(leftWristY);  
    remove_decimals = floor(InNumberleftWristY);  
    volume = remove_decimals/500;  
    document.getElementById("volume").innerHTML = "Volume = " + volume;  
    song.setVolume(volume);  
  }  
}
```