App.js

```
const buttonStr = document.getElementById("btnStart");
const btnRandom = document.getElementById("btnRandom");
const btnRandomVD = document.getElementById("btnRandomVD");
const btnPdf = document.getElementById("btnPdf");
btnPdf.addEventListener("click", () => Pdf())
buttonStr.addEventListener("click", () => Motor())
btnRandom.addEventListener("click", () => Randomizador())
btnRandomVD.addEventListener("click", () => RandomizadorVD())

var doc = new jspdf.jsPDF();
var PosYtxt = 0;
var CantidadDeCalculos = 1;

function Y() {
PosYtxt = PosYtxt + 12;
return PosYtxt;
}
function rY(num) {
PosYtxt = PosYtxt - 12 * num;
}

function Motor()
{
/*
Arriba
_____________________________
| y`-y' | |
|m = _____ | (y-y') = m(x-x')|
| x`-x' | |
|_____________________________|
----------|---------
x' = -325 | x` = 325
y' = 480 | y` = 480
----------|---------
480-480 0
------- = --- = 0
325+325 650

y-480 = 0
y = 480

Abajo Izquierda
----------|--------- ----------|---------
x' = -325 | x` = 325 x' = -325 | x` = -325
y' = -480 | y` = -480 y' = 480 | y` = -480
----------|--------- ----------|---------
```

```
-480+480 0 -480-480 -960
------- = --- = 0 -------- = ---- = Error
325+325 650 -325+325 0

y+480 = 0 y+480 = 0
y = -480 y = -480



Derecha
*/
var r = 1;
var actualizador = Number(document.getElementById("Actualizador").value);
var cir1 = new
Circulo(document.getElementById("Cir1").value,document.getElementById("PosX1").value,do
cument.getElementById("PosY1").value*-
1,document.getElementById("VdX1").value,document.getElementById("VdY1").value * -1);
var cir2 = new
Circulo(document.getElementById("Cir2").value,document.getElementById("PosX2").value,do
cument.getElementById("PosY2").value*-
1,document.getElementById("VdX2").value,document.getElementById("VdY2").value * -1);
var canvas = document.getElementById("myCanvas");
var duracion = Number(document.getElementById("labelduracion").value);
var frecuencia = Number(document.getElementById("labelfrecuencia").value);

this.Dibujador(cir1,cir2,canvas);
var bucle = setInterval(Repetidor,actualizador);
var minibucle = setInterval(Calculador,frecuencia*actualizador);

function Repetidor()
{
Limpieza(cir1.EcuacionVectorialDeLaRecta(r-1),canvas);
Limpieza(cir2.EcuacionVectorialDeLaRecta(r-1),canvas);
Dibujador(cir1.EcuacionVectorialDeLaRecta(r),cir2.EcuacionVectorialDeLaRecta(r),canvas)
cir1.RevisarLados(r);
cir2.RevisarLados(r);
r++;
//console.log(r);
if (r>(duracion-1)) {
clearInterval(bucle);
clearInterval(minibucle);
console.log(r);
}
}

function Calculador() {
//console.log(cir1.EcuacionVectorialDeLaRecta(r));
```

```
var width = doc.internal.pageSize.getWidth();
circulo1 = cir1.EcuacionVectorialDeLaRecta(r);
circulo2 = cir2.EcuacionVectorialDeLaRecta(r);

doc.setFont('courier');
doc.setFontSize(20);

doc.text("Calculo Nº"+CantidadDeCalculos,70,10);
doc.setFontSize(15);

doc.text("Posicion del objeto",70,24);
PosYtxt = 30;
doc.setTextColor(255, 0, 0);
doc.text("Circulo 1", 80,Y());
doc.text(""+circulo1.x, 80,Y());
doc.text(""+circulo1.y, 80,Y());
doc.text(""+circulo1.vdx, 80,Y());
doc.text(""+circulo1.vdy, 80,Y());
doc.text(""+DistLado(0,-1,480, circulo1), 80,Y());
doc.text(""+DistLado(0,-1,-480,circulo1), 80,Y());
doc.text(""+Math.abs(-325 - circulo1.x),80,Y());
doc.text(""+Math.abs(325 - circulo1.x),80,Y());
rY(8);

doc.setTextColor(1);
doc.text("X",20,Y());
doc.text("Y",20,Y());
doc.text("Director X",20,Y());
doc.text("Director Y",20,Y());
doc.text("Esquina superior",20,Y());
doc.text("Esquina inferior",20,Y());
doc.text("Esquina izquierda",20,Y());
doc.text("Esquina derecha",20,Y());
rY(9);

doc.setTextColor(0, 255, 0);
doc.text("Circulo 2", 150,Y());
doc.text(""+circulo2.x, 150,Y());
doc.text(""+circulo2.y, 150,Y());
doc.text(""+circulo2.vdx, 150,Y());
doc.text(""+circulo2.vdy, 150,Y());
doc.text(""+DistLado(0,-1,480, circulo2), 150,Y());
doc.text(""+DistLado(0,-1,-480,circulo2), 150,Y());
doc.text(""+Math.abs(-325 - circulo2.x),150,Y());
doc.text(""+Math.abs(325 - circulo2.x),150,Y());
doc.setTextColor(100);
rY(9);
```

```
PosYtxt = PosYtxt + 5;
doc.setLineWidth(0.2)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)
Y();
doc.line(20, PosYtxt, 200, PosYtxt)

doc.line(78, 30, 78, 138)
doc.line(148, 30, 148, 138)



Y();
Y();


doc.setTextColor(1);
doc.text("Distancia entre si: "+DistanciaEntre2Puntos(circulo1,circulo2),11,Y())
//doc.setTextColor(255, 0, 0);

//doc.setTextColor(0, 255, 0);

if(DistanciaEntre2Puntos(circulo1,circulo2)<= (circulo1.tamaño/2) + (circulo2.tamaño/2))
{
doc.addPage();
x1 = circulo1.x;
y1 = circulo1.y;
r1 = circulo1.tamaño/2;

x2 = circulo2.x;
y2 = circulo2.y;
r2 = circulo2.tamaño/2;

doc.setFontSize(15);
doc.text("Calcular la interseccion de dos circunferencias",20,10);
```

```
PosYtxt = 20;

doc.setFontSize(12);
var na1 = -x1*2;
var na2 = Math.pow(x1,2);
var na3 = -y1*2;
var na4 = Math.pow(y1,2);
var na5 = Math.pow(r1,2);
var na6 = na5+(-na2)+(-na4);
doc.text("x^2"+txt(na1)+"x"+txt(na2)+"+y^2"+txt(na3)+"y"+txt(na4)+" = "+na5,11,Y());
doc.text("x^2"+txt(na1)+"x"+"+y^2"+txt(na3)+"y"+" = "+na5+txt(-na2)+txt(-na4),11,Y());
doc.text("x^2"+txt(na1)+"x"+"+y^2"+txt(na3)+"y"+" = "+na6,11,Y());

var nb1 = -x2*2;
var nb2 = Math.pow(x2,2);
var nb3 = -y2*2;
var nb4 = Math.pow(y2,2);
var nb5 = Math.pow(r2,2);
var nb6 = nb5+(-nb2)+(-nb4);
doc.text("x^2"+txt(nb1)+"x"+txt(nb2)+"+y^2"+txt(nb3)+"y"+txt(nb4)+" = "+nb5,11,Y());
doc.text("x^2"+txt(nb1)+"x"+"+y^2"+txt(nb3)+"y"+" = "+nb5+txt(-nb2)+txt(-nb4),11,Y());
doc.text("x^2"+txt(nb1)+"x"+"+y^2"+txt(nb3)+"y"+" = "+nb6,11,Y());
doc.text("",11,Y());
doc.text("x^2"+txt(na1)+"x"+"+y^2"+txt(na3)+"y"+" = "+na6,11,Y());
doc.text("-x^2"+txt(-nb1)+"x"+"-y^2"+txt(-nb3)+"y"+" = "+(-nb6),11,Y());
doc.text("",11,Y());

var nc1 = na1+(-nb1);
var nc2 = na3+(-nb3);
var nc3 = na6+(-nb6);
var nc4 = nc3/nc2;
var nc5 = -nc1/nc2;
doc.text(nc1+"x"+txt(nc2)+"y = "+nc3,11,Y());
doc.text(nc2+"y = "+nc3+txt(-nc1)+"x",11,Y());
doc.text("y = "+nc4+txt(nc5)+"x",11,Y());
doc.text("",11,Y());

var ecant = nc4+txt(nc5)+"x"
var nd1 = Math.pow(nc4,2);
var nd2 = (nc4*nc5)*2;
var nd3 = Math.pow(nc5,2);
var nd4 = na3*nc4;
var nd5 = na3*nc5;
var nda = Number(nd3+1);
var ndb = Number(na1+nd2+nd5);
var ndc = Number(nd1+nd4+(-na6));
doc.text("x^2"+txt(na1)+"x"+"("+ecant+")^2"+txt(na3)+"*("+ecant+")"+" = "+na6,11,Y());
```

```
doc.text("x^2"+txt(na1)+"x"+txt(nd1)+txt(nd2)+"x"+txt(nd3)+"x^2"+txt(nd4)+txt(nd5)+"x
"+(-na6)+" = 0",11,Y());
doc.text(nda+"x^2"+txt(ndb)+"x"+txt(ndc)+" = 0",11,Y());
doc.text("",11,Y());
doc.text("X1 = "+(-ndb+Math.sqrt(Math.pow(ndb,2)-4*nda*ndc))/ (2*nda),11,Y());
doc.text("X2 = "+(-ndb-Math.sqrt(Math.pow(ndb,2)-4*nda*ndc))/ (2*nda),11,Y());
doc.text("Y1 = "+nc4+nc5*((-ndb+Math.sqrt(Math.pow(ndb,2)-4*nda*ndc))/ (2*nda)),11,Y());
doc.text("Y2 = "+nc4+nc5*((-ndb-Math.sqrt(Math.pow(ndb,2)-4*nda*ndc))/ (2*nda)),11,Y());
}
PosYtxt = 0;
doc.addPage();
CantidadDeCalculos++;
}
}

function Pdf() {
doc.save("Informe.pdf");
doc.close();
}

class Circulo
{
constructor(tamaño,x,y,vdx,vdy)
{
this.tamaño = tamaño;
this.x = Number(x);
this.y = Number(y);
this.vdx = Number(vdx);
this.vdy = Number(vdy);
}

EcuacionVectorialDeLaRecta(r)
{
return new Circulo(this.tamaño,this.x+this.vdx*r,this.y+this.vdy*r,this.vdx,this.vdy);
}
Switchvdy()
{
this.vdy = -this.vdy;
}
Switchvdx()
{
this.vdx = -this.vdx;
}
RevisarLados(r)
{
var circulo = this.EcuacionVectorialDeLaRecta(r);
```

```
if (DistLado(0,-1,-480,circulo)<=this.tamaño) {
circulo.Switchvdy();
var final = circulo.EcuacionVectorialDeLaRecta(r*-1);
this.x = final.x;
this.y = final.y;
this.vdy = final.vdy;
}

if (DistLado(0,-1,480,circulo)<=this.tamaño) {
circulo.Switchvdy();
var final = circulo.EcuacionVectorialDeLaRecta(r*-1);
this.x = final.x;
this.y = final.y;
this.vdy = final.vdy;
}

if (Math.abs(-325 - circulo.x) <= this.tamaño) {
circulo.Switchvdx();
var final = circulo.EcuacionVectorialDeLaRecta(r*-1);
this.x = final.x;
this.y = final.y;
this.vdx = final.vdx;
}

if (Math.abs(325 - circulo.x) <= this.tamaño) {
circulo.Switchvdx();
var final = circulo.EcuacionVectorialDeLaRecta(r*-1);
this.x = final.x;
this.y = final.y;
this.vdx = final.vdx;
}
}
}
function DistanciaEntre2Puntos(cir1,cir2)
{
return Math.sqrt(Math.pow(cir1.x-cir2.x,2) + Math.pow(cir1.y-cir2.y,2));
}

function DistLado(x,y,num,circle)
{
return(Math.abs(x*circle.x+y*circle.y+num)/Math.sqrt(Math.pow(x,2) + Math.pow(y,2)));
}

function Dibujador(cir1,cir2,canvas)
{
var circle = canvas.getContext("2d");
circle.beginPath();
```

```
circle.arc(cir1.x + (canvas.width/2),(cir1.y + canvas.height/2),cir1.tamaño,0,180);
circle.fillStyle = "red";
circle.fill();
circle.stroke();

circle.beginPath();
circle.arc(cir2.x + (canvas.width/2),cir2.y + canvas.height/2,cir2.tamaño,0,180);
circle.fillStyle = "green";
circle.fill();
circle.stroke();
}

function Limpieza(cir,canvas)
{
var canvas = document.getElementById("myCanvas");
var ctx = canvas.getContext("2d");
ctx.clearRect((cir.x + canvas.width/2) - cir.tamaño-2, (cir.y + canvas.height/2)- cir.tamaño-2,
cir.tamaño*2+ 5, cir.tamaño*2+5);
}

function Randomizador() {
var canvas = document.getElementById("myCanvas");
var x = canvas.width/2 - Number(document.getElementById("Cir1").value);
var y = canvas.height/2;
console.log(Math.floor(Math.random()*(20-0)+0));

document.getElementById("PosX1").value = Math.floor(Math.random()*(x-(x*-1))+(x*-1));
document.getElementById("PosY1").value = Math.floor(Math.random()*(y-(y*-1))+(y*-1));
document.getElementById("PosX2").value = Math.floor(Math.random()*(x-(x*-1))+(x*-1));
document.getElementById("PosY2").value = Math.floor(Math.random()*(y-(y*-1))+(y*-1));
}

function RandomizadorVD() {
document.getElementById("VdX1").value = Math.floor(Math.random()*(10-(-10))+(-10));
document.getElementById("VdY1").value = Math.floor(Math.random()*(10-(-10))+(-10));
document.getElementById("VdX2").value = Math.floor(Math.random()*(10-(-10))+(-10));
document.getElementById("VdY2").value = Math.floor(Math.random()*(10-(-10))+(-10));
}

function txt(num)
{
if (num < 0)
{
return num + "";
}else
{
return "+" + num;
```

```
}
}
```

Final.html

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Final</title><meta name="viewport" content="width=device-width, initial-scale=1">
<style>
* {
box-sizing: border-box;
}
/* Create three unequal columns that floats next to each other */
.column {
float: left;
padding: 10px;
height: 960px; /* Should be removed. Only for demonstration */
}
.left, .right {
width: 20%;
}
.middle {
width: 60%;
}
/* Clear floats after the columns */
.row:after {
content: "";
display: table;
clear: both;
}
</style>
<script src="https://cdnjs.cloudflare.com/ajax/libs/jspdf/2.3.1/jspdf.umd.min.js"></script>
</head>
<body>
<h2>Simulador de colision de circunferencias</h2>
<button id = "btnStart"> Start</button>
<button id = "btnPdf"> PDF</button>

<div class="row">
<div class="column left" style="background-color:#aaa;">
<h2>Dimensiones</h2>
<h5>
X = 640
</h5>
<h5>
```

```
Y = 960
</h5>
<h5>
Velocidad <input type="text" value="1000" id = Actualizador>
</h5>
<h5>
Tiempo de duracion <input type="text" value="200" id = labelduracion>
</h5>
<h5>
Frecuencia de calculado <input type="text" value="10" id = labelfrecuencia>
</h5>
</div>

<div class="column middle" style="background-color:#bbb;">

<canvas id="myCanvas" width="640" height="960" style="border:1px solid
#000000;"></canvas>
<script type="text/javascript">
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
ctx.moveTo(c.width/2,0);
ctx.lineTo(c.width/2,c.height);
ctx.stroke();
ctx.moveTo(0,c.height/2);
ctx.lineTo(c.width,c.height/2);
ctx.stroke();
</script>
</div>

<div class="column right" style="background-color:#ccc;">
<button id = "btnRandom">Randomizador de ubicaciones</button>
<button id = "btnRandomVD">Randomizador de VD</button>
<h5 style="color:Tomato;">
Radio <input type="text" value="10" id = Cir1>
X <input type="text" value="2" id = PosX1>
Y <input type="text" value="5" id = PosY1>
Vector Director
X <input type="text" value="5" id = VdX1>
Vector Director
Y <input type="text" value="5" id = VdY1>
</h5>
<h5 style="color:rgb(26, 83, 9);">
Radio <input type="text" value="10" id = Cir2>
X <input type="text" value="0" id = PosX2>
Y <input type="text" value="0" id = PosY2>
Vector Director
X <input type="text" value="5" id = VdX2>
```

```
Vector Director
Y <input type="text" value="5" id = VdY2>
</h5>
</div>
<script src="App.js"></script>
</body>
</html>
```