Task 1 08.09.2016

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We have train road with 1000 pixels and two metro trains.

Trains at start have speed of 10 points and move in a clockwise direction.

At each iteration the speed changes by -1, 0, +1 randomly.

Animation stops when trains collide.

If the speed of the metro cars falls less than zero then it is equal to zero.

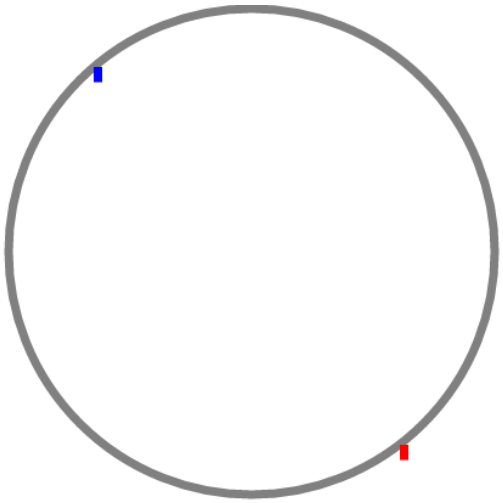
To document attached .jpg pictures showing the operation of the program.

Speed function:

Iteration 1:

μ_1={0; 0; 1; 0; 0;} ► **10**

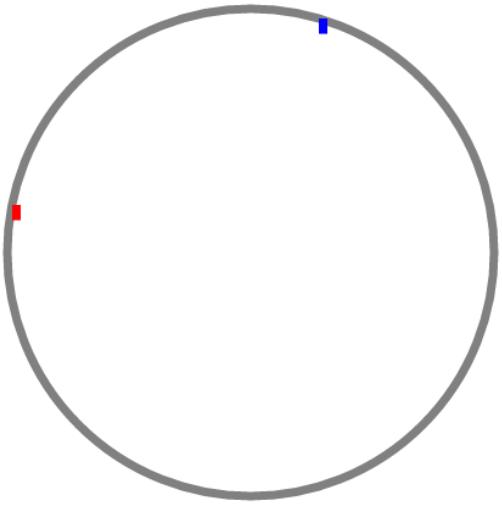
μ_2={0; 0; 1; 0; 0;} ► **10**



Iteration 2:

μ_1={0; 0; 0.75; 0.25; 0;} ► **11**

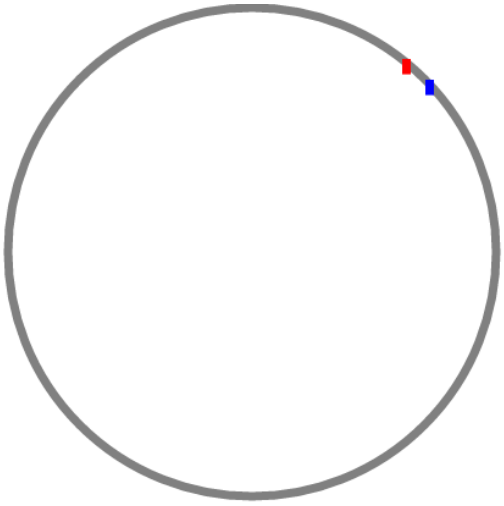
μ_2={0; 0.25; 0.75; 0; 0;} ► **9**



Iteration 3:

μ_1={0; 0; 0; 0. 5; 0.5;} ► **16**

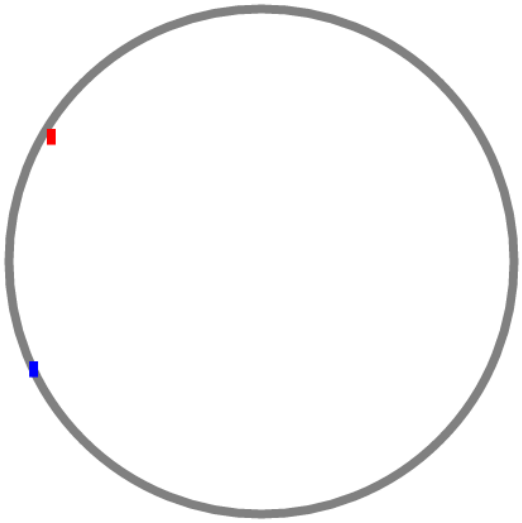
μ_2={0; 1; 0; 0; 0;} ► **6**



Iteration 4:

μ_1={1; 0; 0; 0; 0;} ► **2**

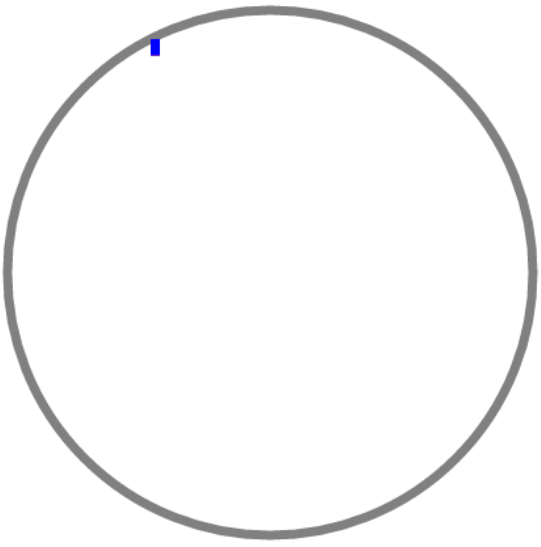
μ_2={0; 0; 0; 1; 0;} ► **14**



Iteration 5:

μ_1={0; 0.75; 0.25; 0; 0;} ► **7 p/t**

μ_2={0; 0; 0; 0.25; 0.75;} ► **17 p/t**



End of program.

The source code:

JavaScript

```
function DrawTrainPosition(angle_1, angle_2) {
    var point_1 = ConvertAngleToCoordinate(250, 250, 200, angle_1);
    var point_2 = ConvertAngleToCoordinate(250, 250, 200, angle_2);

    console.log('x', point_1.x);
    console.log('y', point_1.y);

    var canvas = document.getElementById("myCanvas");
    var ctx = canvas.getContext("2d");

    ctx.clearRect(0, 0, 500, 500);

    ctx.beginPath();
    ctx.arc(250, 250, 200, 0, 2 * Math.PI);
ctx.lineWidth = 7;
    ctx.strokeStyle = "grey";
    ctx.stroke();

    ctx.beginPath();
    ctx.fillStyle = "red";
    ctx.fillRect(point_1.x, point_1.y,7,4 * Math.PI);
    ctx.fill();

    ctx.beginPath();
    ctx.fillStyle = "blue";
    ctx.fillRect(point_2.x, point_2.y,7,4 * Math.PI);
    ctx.fill();

    console.log('Draw');
}
//ctx.stroke();
function ConvertAngleToCoordinate(x, y, r, angle) {
    return {
        x: Math.round(x + r * Math.cos(angle)),
```

```
        y: Math.round(y + r * Math.sin(angle))

    }
}
var angle_1 = 0;
var angle_2 = Math.PI;

var train_1 = {
    speed: 10,
    stop: 0,
    distance: 500
};
var train_2 = {
    speed: 10,
    stop: 0,
    distance: 500
};

var isStop = false;

function ChangeValue() {
    console.log('angle_1', angle_1);
    console.log('angle_2', angle_2);
    DrawTrainPosition(angle_1, angle_2);
    var divTrain1 = document.getElementById("train1");
    var divTrain2 = document.getElementById("train2");



    if (train_1.distance <= 0 || train_2.distance <= 0) {
        DrawTrainPosition(angle_1, angle_1);
        train_1.distance = train_1.distance <= 0 ? 0 : 1000;
        train_2.distance = train_2.distance <= 0 ? 0 : 1000;
        isStop = true;
    }

    divTrain1.innerText = 'Train 1:\nspeed: ' + train_1.speed + '\ndistance: ' +
train_1.distance;
```

```
    divTrain2.innerText = 'Train 2:\nspeed: ' + train_2.speed + '\ndistance: ' +
train_2.distance;


    train_1.speed += Math.floor(3 * Math.random()) - 1;
    if (train_1.speed < 0) {
        train_1.speed = 0;
    }
    train_1.distance -= train_1.speed;
    train_2.distance += train_1.speed;



    train_2.speed += Math.floor(3 * Math.random()) - 1;
    if (train_2.speed < 0) {
        train_2.speed = 0;
    }
    train_2.distance -= train_2.speed;
    train_1.distance += train_2.speed;



    console.log('train_1.speed', train_1.speed);
    console.log('train_1.distance', train_1.distance);
    console.log('train_2.speed', train_2.speed);
    console.log('train_2.distance', train_2.distance);
    angle_1 += train_1.speed * Math.PI / 500;
    angle_2 += train_2.speed * Math.PI / 500;
}


setInterval(() => {
    if (isStop) {
        return;
    }
    ChangeValue();
}, 50);
```

Html

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <title>Lab1</title>
    <style>
        .status {
            display: inline-block;
        }
    </style>
</head>

<body>

    <canvas id="myCanvas" width="500" height="500">
    </canvas>
    <div class="status">
        <div style="color:">Train 1()</div>
        <div id="train1"></div>
        <div style="color:"></div>
        <div id="train2"></div>
    </div>
    <script src="./script.js"></script>
</body>

</html>
```