

Contemporary Data Processing Technology (CCOD)

Lab 1 (September 08, 2016)

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Control two metro cars using Speed, Distance, and Brake

In this practice we made a model of 2 trains on plain loop with length of 1000 points. Every train at the beginning have the speed of 10 points and move in clockwise stream.

On each iteration we change speed adding -1, 0, +1 at random. Speed should be ≥ 0 .

When the distance between trains is 0 we stop the movement.

The program can be run in every browser(it's an .html page)

Here is the source code:

Script.js

```
function DrawTrainPosition(agl1, agl2) {
    var dot1 = ConvertAngleToCoordinate(250, 250, 200, agl1);
    var dot2 = ConvertAngleToCoordinate(250, 250, 200, agl2);
    var canvas = document.getElementById("Canvas");
    var ctx = canvas.getContext("2d");
    ctx.clearRect(0, 0, 500, 500);
    ctx.beginPath();
    ctx.fillStyle = "black";
    ctx.arc(250, 250, 200, 0, 2 * Math.PI);
    ctx.stroke();
    ctx.beginPath();
    ctx.fillStyle = "#13A3F2";
    ctx.arc(dot1.x, dot1.y, 15, 0, 2 * Math.PI);
    ctx.fill();
    ctx.beginPath();
    ctx.fillStyle = "#228228";
    ctx.arc(dot2.x, dot2.y, 15, 0, 2 * Math.PI);
    ctx.fill();
}
function ConvertAngleToCoordinate(x, y, r, angle) {
    return {
        x: Math.round(x + r * Math.cos(angle)),
        y: Math.round(y + r * Math.sin(angle))
    }
}
var agl1 = 0;
var agl2 = 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() {
    DrawTrainPosition(agl1, agl2);
    var divTrain1 = document.getElementById("train1");
    var divTrain2 = document.getElementById("train2");
    if (train_1.distance <= 0 || train_2.distance <= 0) {
        DrawTrainPosition(agl1, agl1);
        train_1.distance = train_1.distance <= 0 ? 0 : 1000;
        train_2.distance = train_2.distance <= 0 ? 0 : 1000;
        isStop = true;
    }

    divTrain1.innerHTML = 'Train 1:\nspeed: ' + train_1.speed + '\ndistance: ' + train_1.distance;
    divTrain2.innerHTML = '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;
    agl1 += train_1.speed * Math.PI / 500;
    agl2 += train_2.speed * Math.PI / 500;
}
setInterval(() => {
    if (isStop) {
        return;
    }
    ChangeValue();
}, 50);

```

Index.html

```
<!DOCTYPE html>
```

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

```
<head>
```

```
    <meta charset="UTF-8">
```

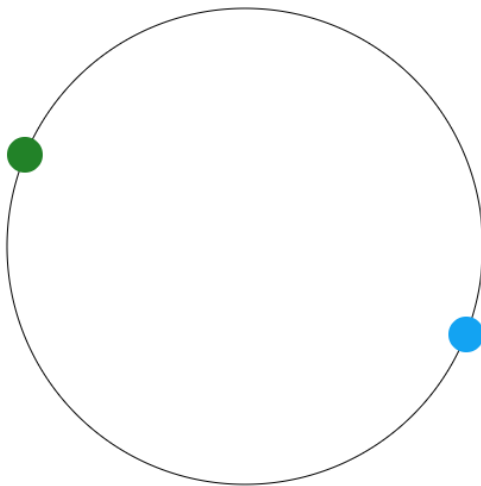
```
    <title>Lab1</title>
```

```
</head>
```

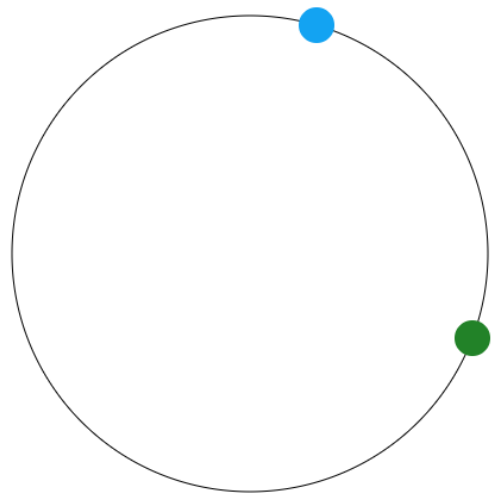
```
<body>
  <canvas id="Canvas" width="500" height="500">
    </canvas>
    <div id="train1"></div>
    <div id="train2"></div>
  </div>
  <script src="./script.js"></script>
</body>
```

```
</html>
```

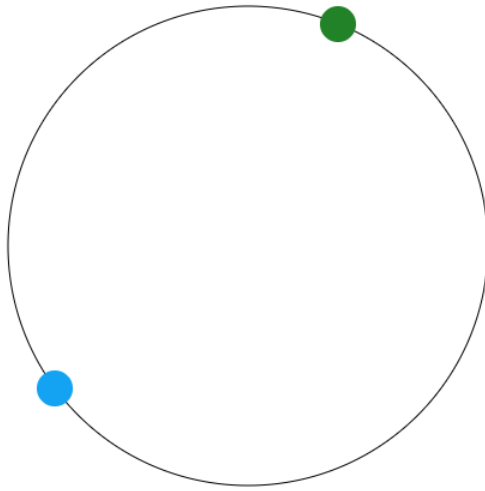
Results:



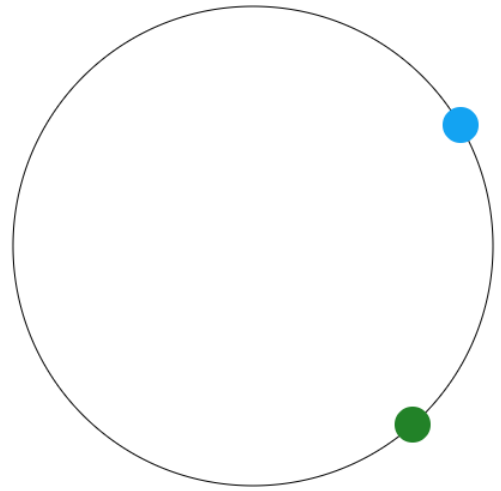
Train 1:
speed: 10
distance: 503
Train 2:
speed: 8
distance: 497



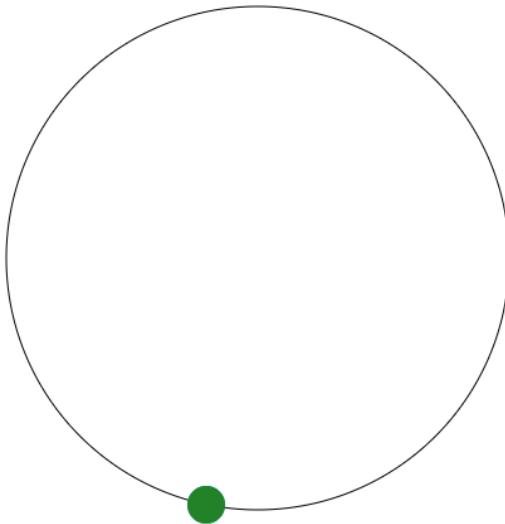
Train 1:
speed: 15
distance: 263
Train 2:
speed: 4
distance: 737



Train 1:
 speed: 12
 distance: 412
 Train 2:
 speed: 4
 distance: 588



Train 1:
 speed: 4
 distance: 218
 Train 2:
 speed: 4
 distance: 782



Train 1:
 speed: 16
 distance: 0
 Train 2:
 speed: 6
 distance: 1000