

Contemporary Data Processing Technology (CCOD)

Lab 1 (September 09, 2016)

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Control two metro cars using Speed, Distance, and Brake

In our practice work we made a model of 2 cars on plain loop with length of 1000 points. Every car at the beginning have the speed of 10 points and move in clockwise stream. At every iteration randomly the speed may change by -1, 0, +1.

The movement breaks, when the distance between these cars equals 0.

Writing code on JavaScript, our iterations depends on setInterval() Method, which make an iteration every N miliseconds, in my case, 50ms.

If the speed becomes less than zero, its value is set to zero.

On .gif animated picture you can see the result of running the code. Here are shown the loop with cars and some results: speed, distance between cars and coordinates of each car.

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

Here is the source code(it will also be in attachments to email)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>CCOD_lab_1 Results</title>
  <script>
    var point_1 = {};
    var point_2 = {};
    // Fucntion for drawing the animation on web-page
    function DrawTrainPosition(angle_1, angle_2) {
      point_1 = coords(250, 250, 200, angle_1);
      point_2 = coords(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);
```

```

//main circle
ctx.beginPath();
ctx.fillStyle = "black";
ctx.arc(250, 250, 200, 0, 2 * Math.PI);
ctx.stroke();
//circles for cars
ctx.beginPath();
ctx.fillStyle = "#23ac62";
ctx.arc(point_1.x, point_1.y, 15, 0, 2 * Math.PI);
ctx.fill();

ctx.beginPath();
ctx.fillStyle = "#222";
ctx.arc(point_2.x, point_2.y, 15, 0, 2 * Math.PI);
ctx.fill();
}

//function for gettin the coordinates of a car
function coords(x, y, radius, angle) {
    return {
        x: Math.round(x + radius * Math.cos(angle)),
        y: Math.round(y + radius * Math.sin(angle))
    }
}

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

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

var train_B = {
    speed: 10,
    stop: 0,
    distance: 500
}

```

```

    });

    //parameter for stopping the iterations
    var isStop = false;

    //function changes speed of cars on every iteration and also changes
distance a coordinates
    function ChangeValue() {
        DrawTrainPosition(angle_1, angle_2);
        var first_track = document.getElementById("first");
        var second_track = document.getElementById("second");

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

        first_track.innerHTML = 'Train 1:\nspeed: ' + train_A.speed +
'\ndistance: ' + train_A.distance + '\nCoordinates = [' + point_1.x + ', ' + point_1.y
+ ']';

        second_track.innerHTML = 'Train 2:\nspeed: ' + train_B.speed +
'\ndistance: ' + train_B.distance + '\nCoordinates = [' + point_2.x + ', ' + point_2.y
+ ']';

        //randomly sets the speed of an A car on each iteration and
calculates the distance
        train_A.speed += Math.floor(3 * Math.random()) - 1;
        train_A.speed < 0 ? train_A.speed = 0 : train_A.speed;
        train_A.distance -= train_A.speed;
        train_B.distance += train_A.speed;

        //randomly sets the speed of a B car on each iteration and calculates
the distance
        train_B.speed += Math.floor(3 * Math.random()) - 1;
        train_B.speed < 0 ? train_B.speed = 0 : train_B.speed;
        train_B.distance -= train_B.speed;
        train_A.distance += train_B.speed;

```

```
        angle_1 += train_A.speed * Math.PI / 500;
        angle_2 += train_B.speed * Math.PI / 500;
    }
    function stop(){
        if (isStop) {
            return;
        }
        ChangeValue();
    };
    setInterval(stop, 50);
</script>
</head>
<body>
    <canvas id="myCanvas" width="500" height="500">
    </canvas>
    <div class="status">
        <div id="first"></div>
        <div id="second"></div>
    </div>
</body>
</html>
```