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Task №1. Virtual metro

I 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. On each iteration we change speed adding 1, 0, 2 at random. Speed should be $\geq 0 < 20$. When the distance between trains is 0 we stop the movement.

Here is the source code:

.js

```
var canvas = document.getElementById("drawingCanvas");
var context = canvas.getContext("2d");

context.lineWidth = 0.5;
context.strokeStyle = "rgb(16,155,252)";

var centerX = 350;
var centerY = 300;
var radius = 160;
var startingAngle = 0;
var trainRad = 20;
var endingAngle = 2 * Math.PI;
var angle1 = 0;
var angle2 = 20;
var speed1 = 10;
var speed2 = 10;
var distance1;
var distance2;

context.arc(centerX, centerY, radius, startingAngle, endingAngle);
context.stroke();
var coord = {x:0,y:0};
var squarePosition_x = 10;
var squarePosition_y = 0;

function Draw (angle,color)
{
```

```

        var coord/*object*/ = getAngle(angle);
        context.beginPath();
        context.arc(coord.x, coord.y, trainRad, startingAngle, endingAngle);
        context.fillStyle = color;
        context.fill();

    }
    function getAngle(angle)
    {

        var coord = {};
        coord.x = Math.cos(angle * Math.PI / 180) * radius + centerX; //180
        coord.y = Math.sin(angle * Math.PI / 180) * radius + centerY; //180
        return coord;
    }

    function getRandomChangeofSpeed(speed)
    {
        var randomSpeed;
        randomSpeed = Math.floor(Math.random()*3);
        switch (randomSpeed)
        {
            case 0: if(speed<20)
                    speed++;
                    else;
                    break;
            case 1:
                    if(speed>0)
                    speed--;
                    else
                    break;
            case 2:
                    break;

        }
        return speed;
    }

    function drawFrame() {

```

```

        context.clearRect(0, 0, canvas.width, canvas.height);
        context.beginPath();
        context.arc(centerX, centerY, radius, startingAngle, endingAngle);
        context.stroke();
        speed1 = getRandomChangeofSpeed(speed1);
        console.log("speed1 = "+speed1);
        //console.log("distance1 = "+distance1);

        speed2 = getRandomChangeofSpeed(speed2);
        console.log("speed2 = "+speed2);
        distance2= (angle1-angle2)*radius;
        //console.log("distance2 = "+distance2);
        distance1= (angle2-angle1)*radius;
        //console.log("angle2-angle1");
        Draw(angle1,"red");
        Draw(angle2, "blue");

        if (distance1 <= 0 || distance2 >= 0)
        {
            clearInterval(target);
        }

        angle1 += speed1*Math.PI/180;
        angle2 += speed2*Math.PI/180;
    }
    var target = setInterval(drawFrame, 0.1);

```

.html

```

<!DOCTYPE HTML>
<html>
<head>
<meta charset="utf-8">
<title>METPO</title>
<style>
    canvas {
        border: 1px dashed cyan;
    }
</style>

```

```

</head>
<body>
  <canvas id="drawingCanvas" width="700" height="600"></canvas>

  <script src="js/metro.js">

</script>
</body>
</html>

```

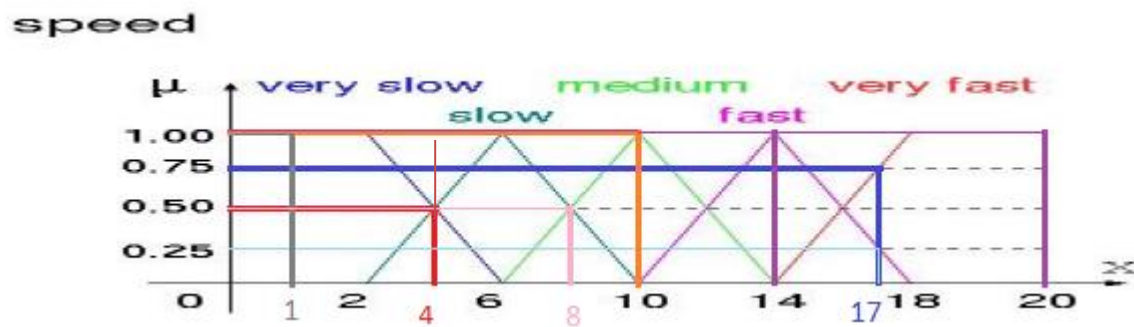
.CSS

```

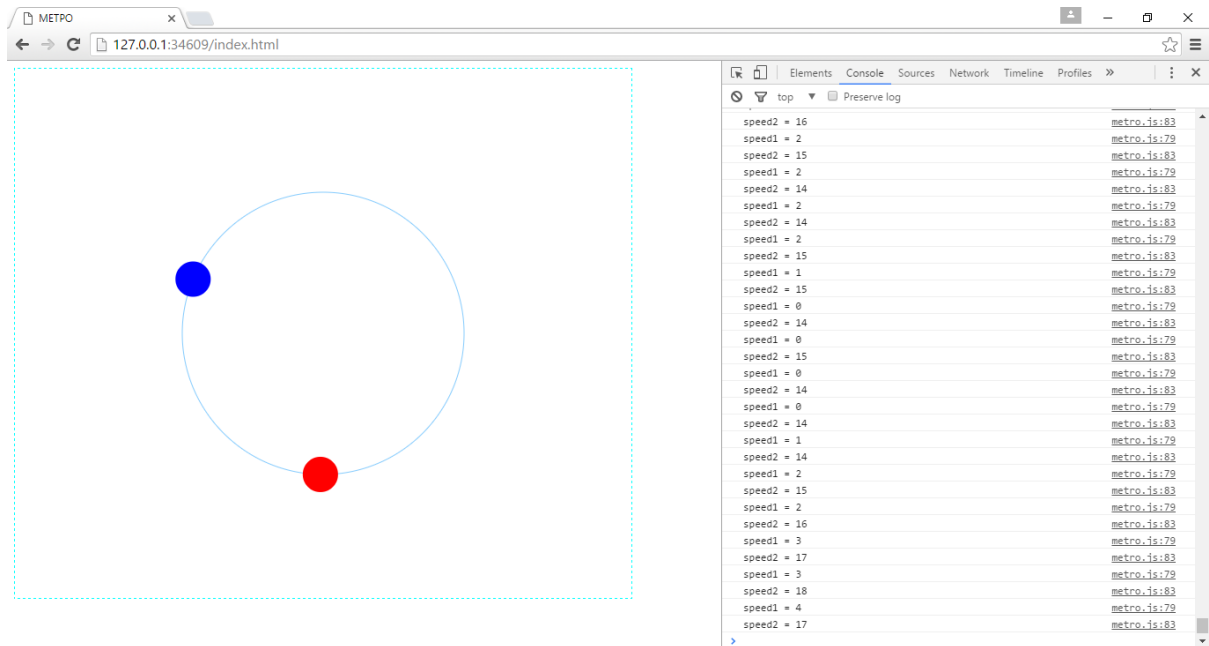
canvas {
  border: 1px dashed black;
}

```

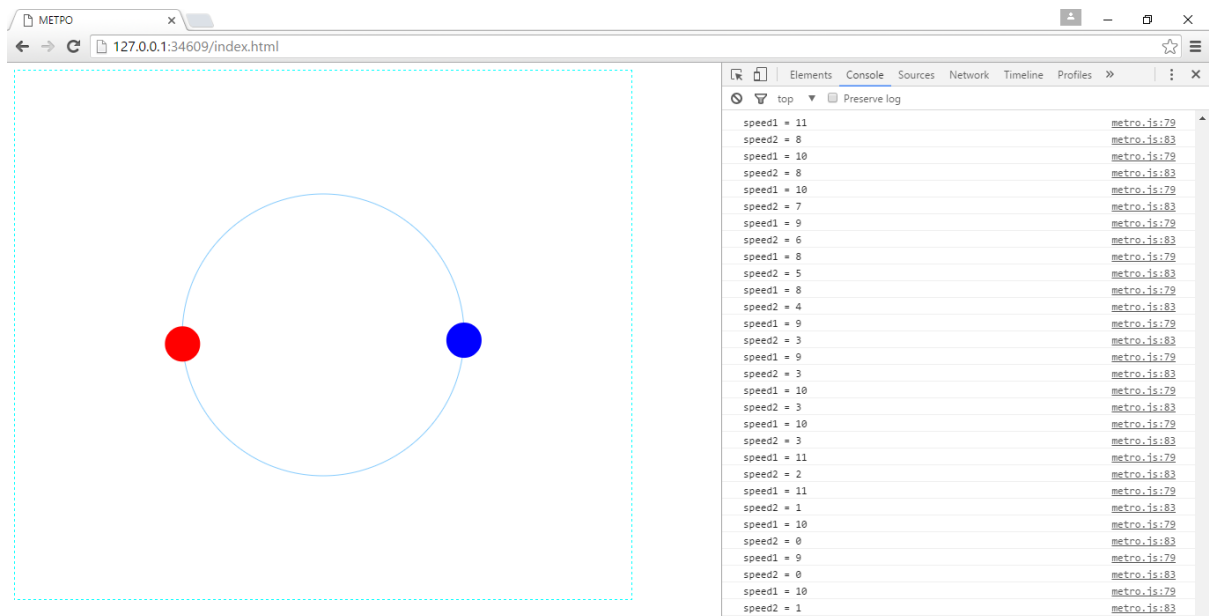
Here is the graph (An example of 5 membership function for speed):



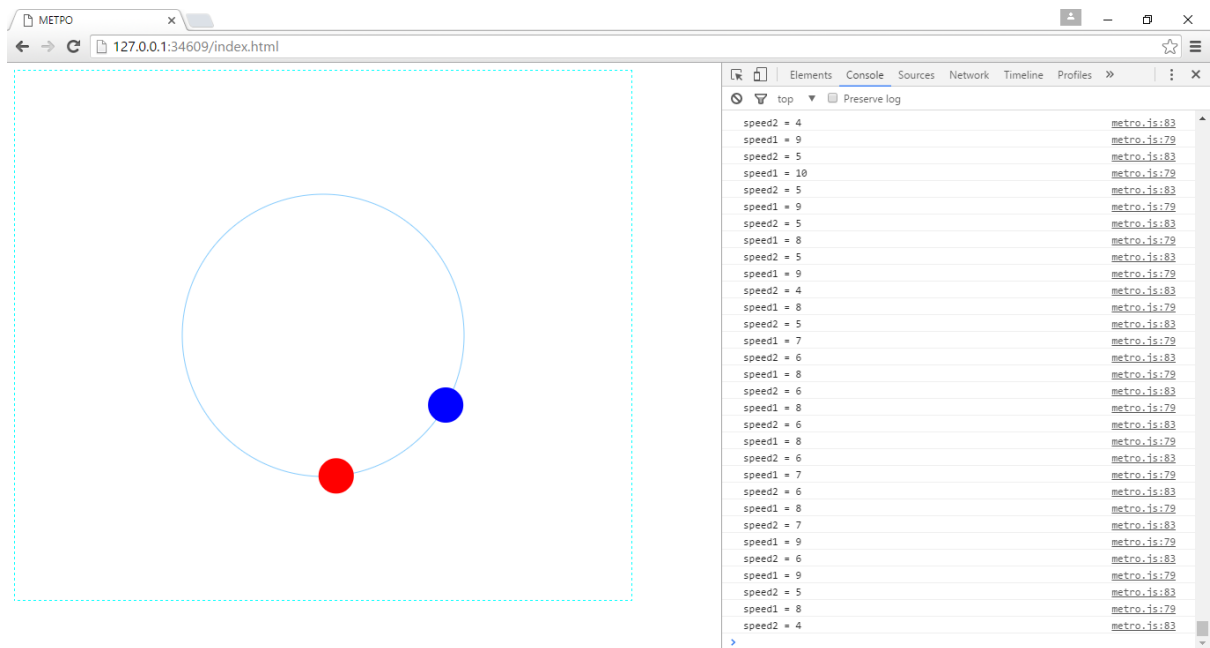
Results:



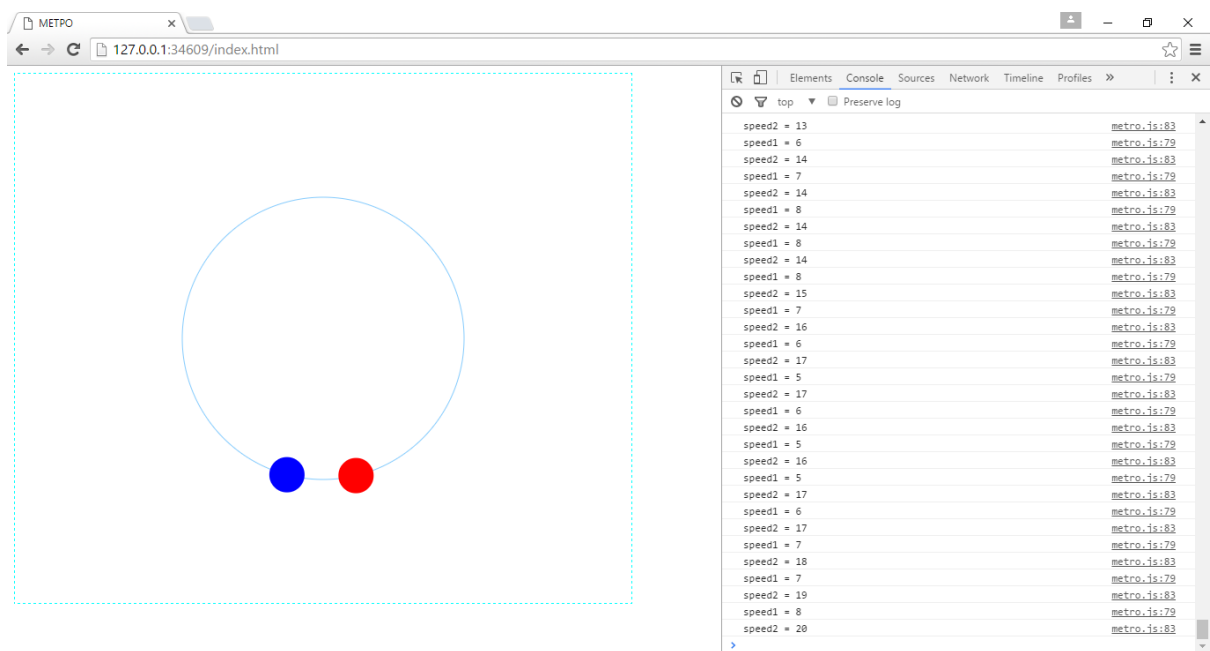
Train1 (speed=4)	Very slow 0.5	Slow 0.5	Medium 0	Fast 0	Very fast 0
Train2 (speed=17)	Very slow 0	Slow 0	Medium 0	Fast 0.25	Very fast 0.75



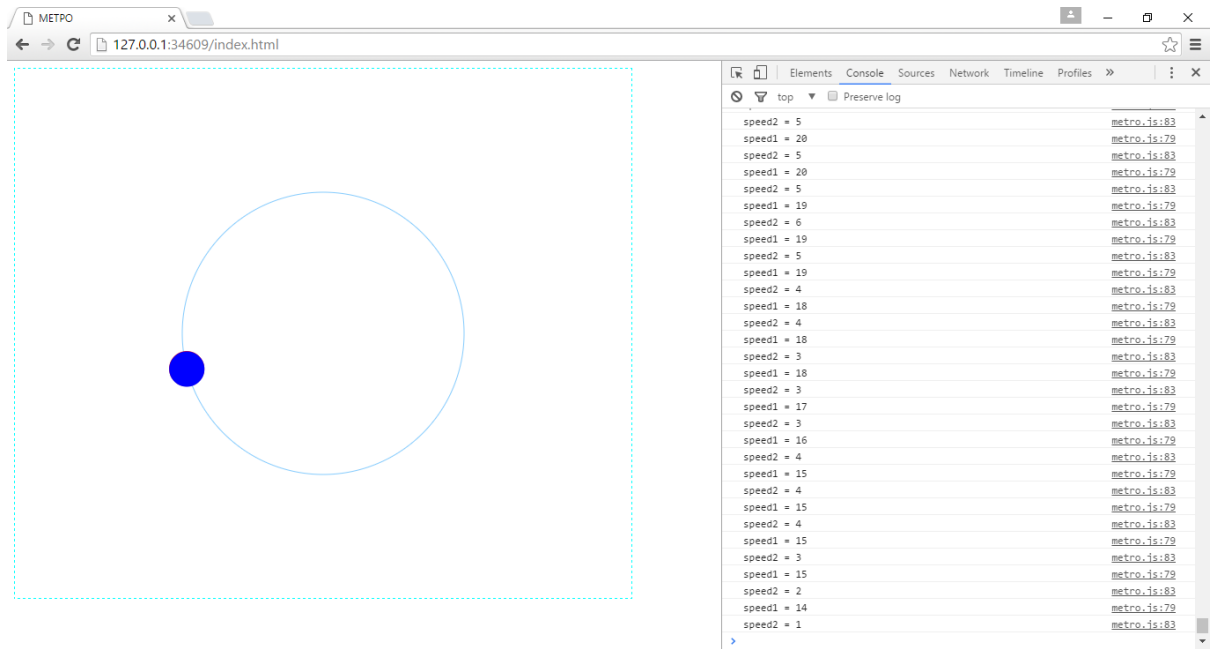
Train1 (speed=10)	Very slow 0	Slow 0	Medium 1	Fast 0	Very fast 0
Train2 (speed=1)	Very slow 1	Slow 0	Medium 0	Fast 0	Very fast 0



Train1 (speed=8)	Very slow	Slow	Medium	Fast	Very fast
	0	0.5	0.5	0	0
Train2 (speed=4)	Very slow	Slow	Medium	Fast	Very fast
	0.5	0.5	0	0	0



Train1 (speed=8)	Very slow	Slow	Medium	Fast	Very fast
	0	0.5	0.5	0	0
Train2 (speed=20)	Very slow	Slow	Medium	Fast	Very fast
	0	0	0	0	1



Train1 (speed=14)	Very slow	Slow	Medium	Fast	Very fast
	0	0	0	1	0
Train2 (speed=1)	Very slow	Slow	Medium	Fast	Very fast
	1	0	0	0	0