

Programming I (COM 116)

Project #1, Graphics (10%)

Overview

Create 10 graphical applications in Java to draw various shapes to the screen. Use the `GraphicsTemplate.java` as a base source file for every program. Inside, put your code into the `void draw(Graphics g)` method.

Grading

Every program weights *1%*. In total you can get up to *10%* for the project.

Submission

Bring your works to the final examination. Be prepared to defend you project. During the defence you will be asked to rewrite parts of the programs from scratch without looking at the original source code.

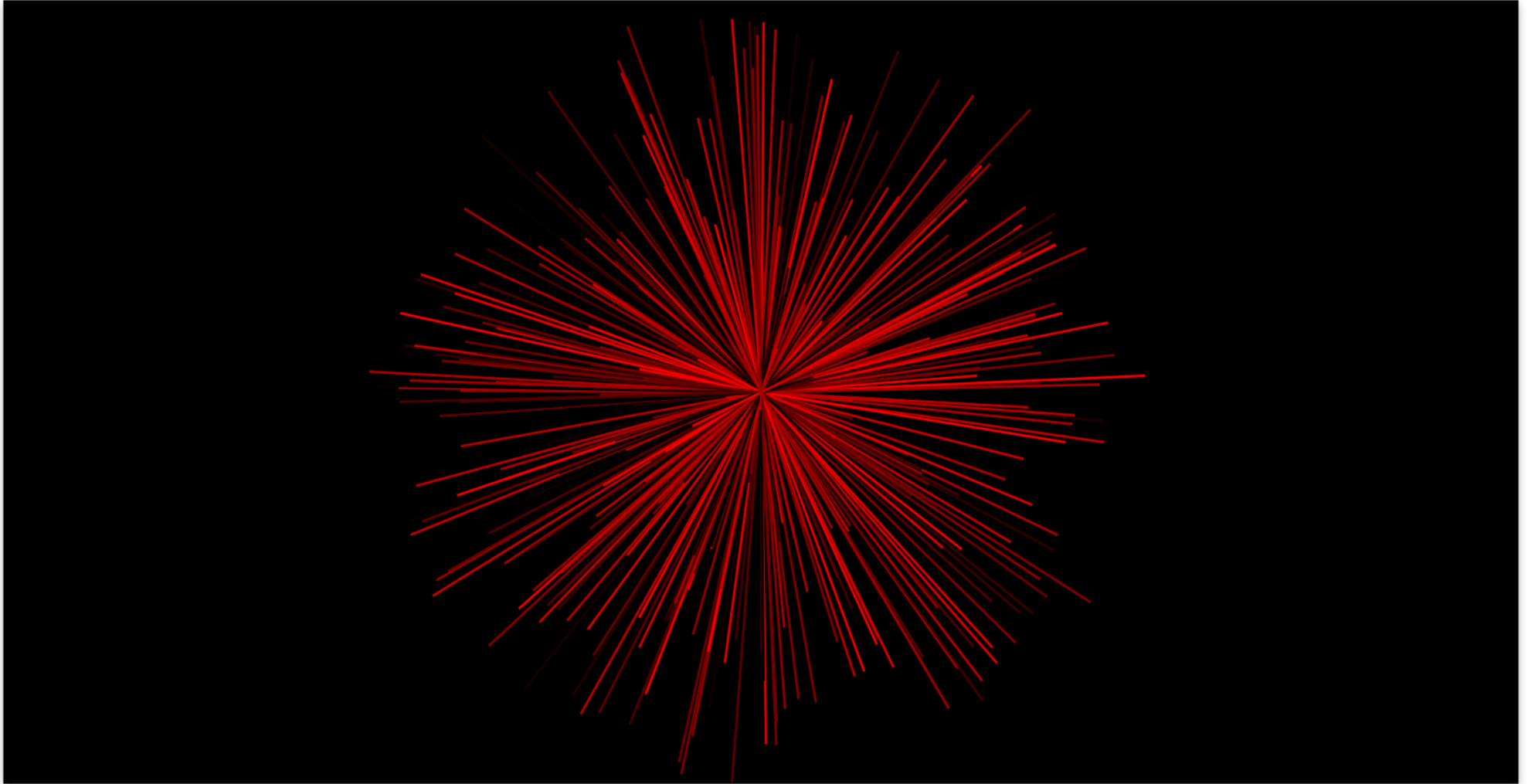
Rules

Students are required to follow the rules of conduct of the Software Engineering Department and American University of Central Asia.

Teamwork is NOT encouraged. The same blocks of code or similar structural pieces in separate works will be considered as academic dishonesty and all parties will get zero for the task.

Program #1: A Star

Draw a star at the center of the screen. Use different shades of red to color its lines.



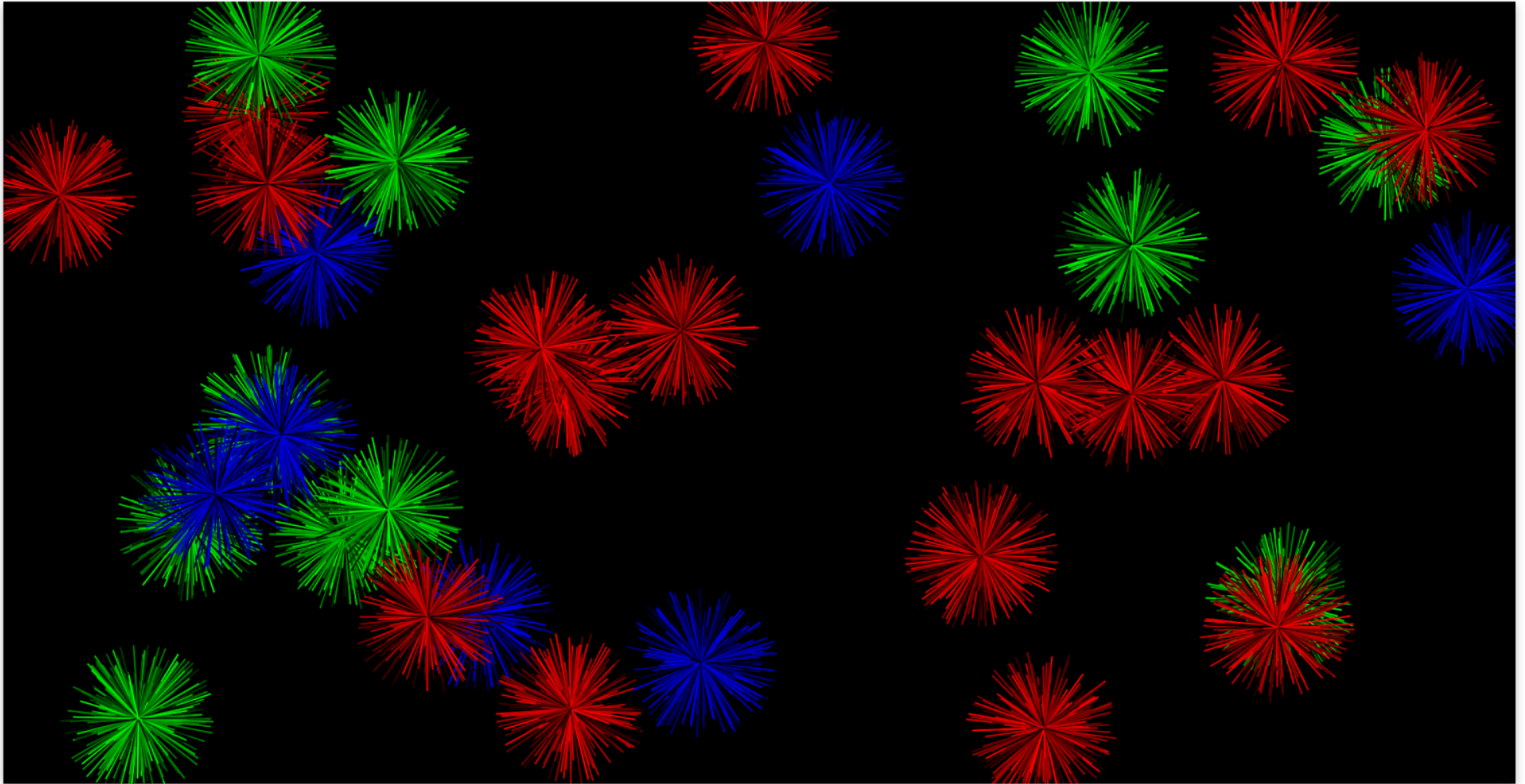
Notes

Allow to specify the number of lines with a constant.

```
final int N = 500; // number of lines in a star
```

Program #2: Stars

Draw a number of stars at random positions of the screen. Randomly select colors for every star. The colors should be either red, green or blue.



Notes

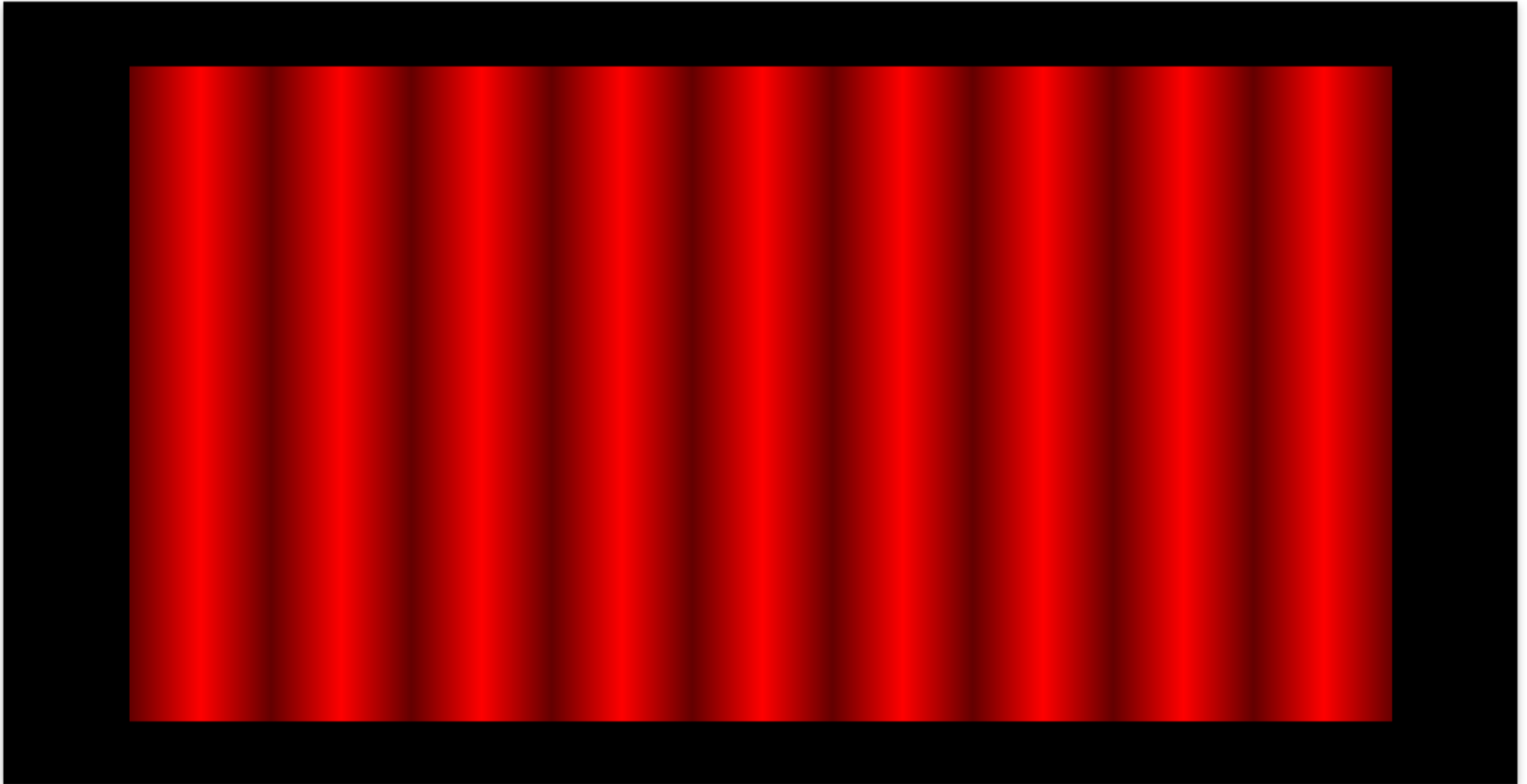
Allow to specify the number of stars and the number of lines in each star.

```
final int N = 500; // number of lines in one star
```

```
final int M = 35; // number of stars
```

Program #3: Gradients

Draw a number of bars with reflected gradients from one shade of red to another.



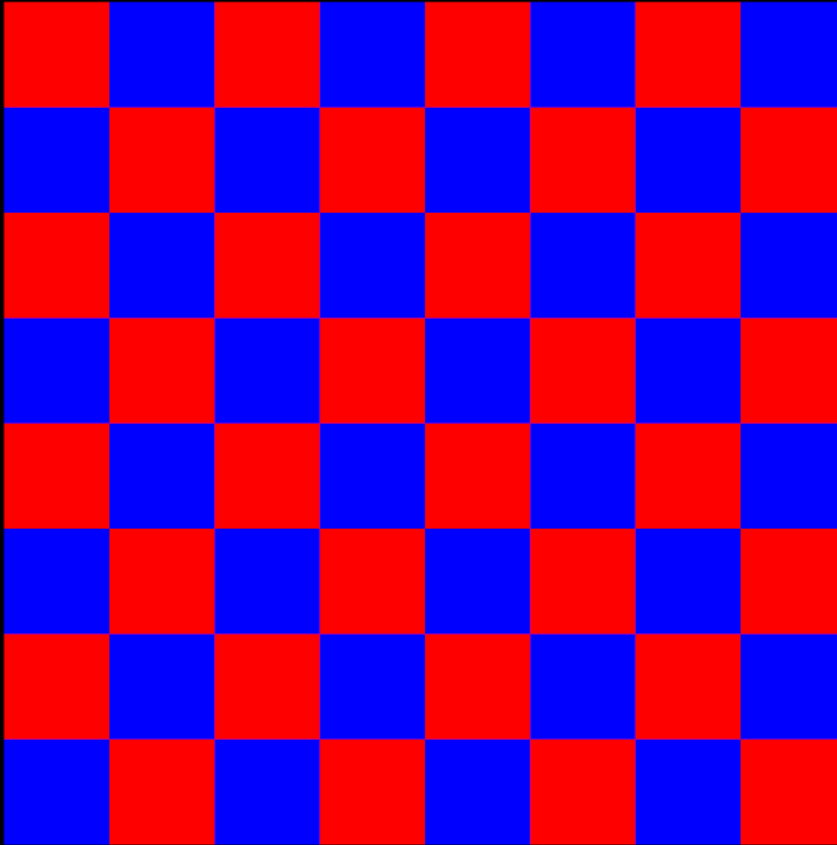
Notes

Allow to specify the number of bars.

```
final int N = 9; // number of bars
```

Program #4: A Checkerboard Pattern

Draw a checkerboard pattern with two different colors.



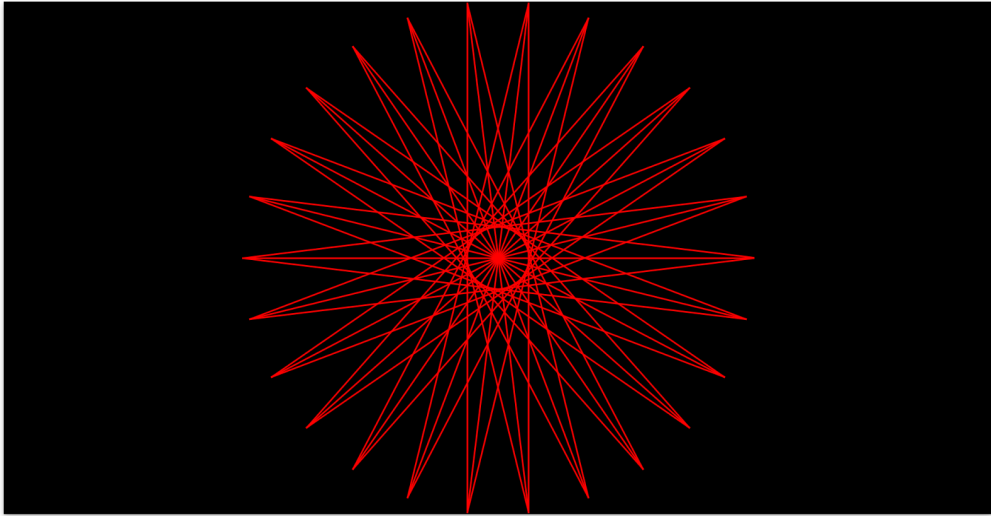
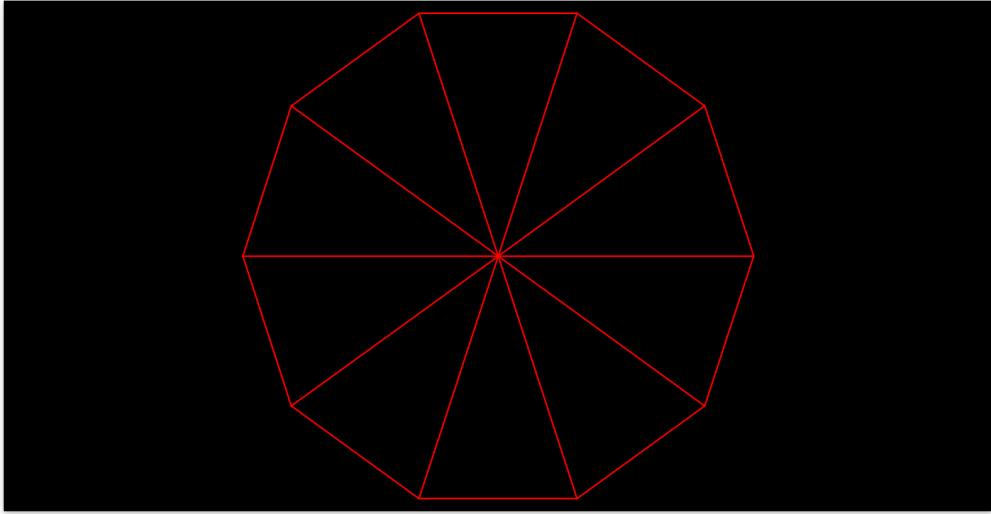
Notes

Allow to specify the number of rows and columns.

```
final int N = 8; // number of rows and columns
```

Program #5, #6: Vertices

Draw a number of vertices connected in various ways.



Notes

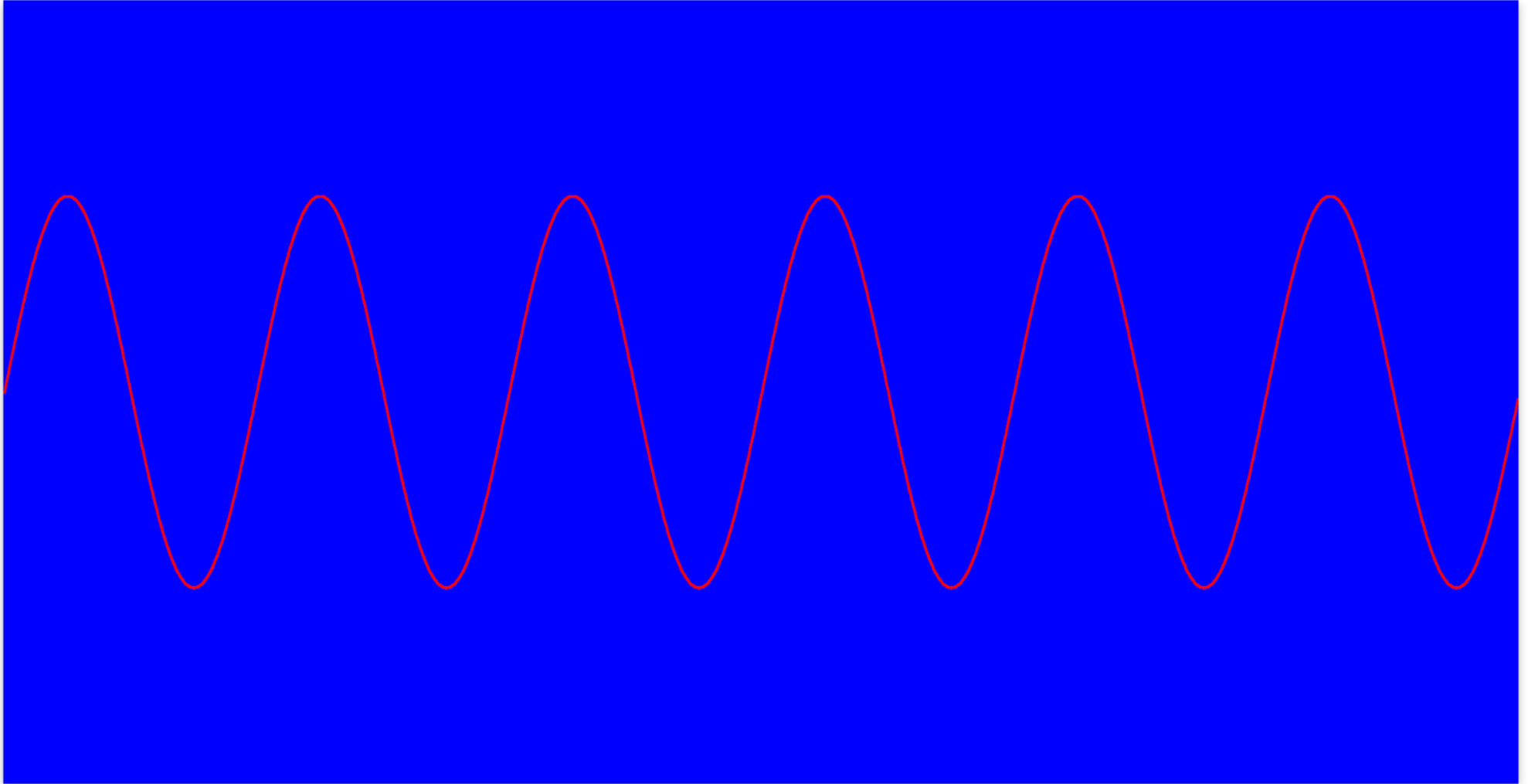
Allow to specify the number of vertices and the number of vertices to skip connecting them with lines.

```
final int N = 26; // number of vertices
```

```
final int M = 12; // number of vertices you have to skip connecting them
```

Program #7: A Sine Wave

Draw a sine wave.



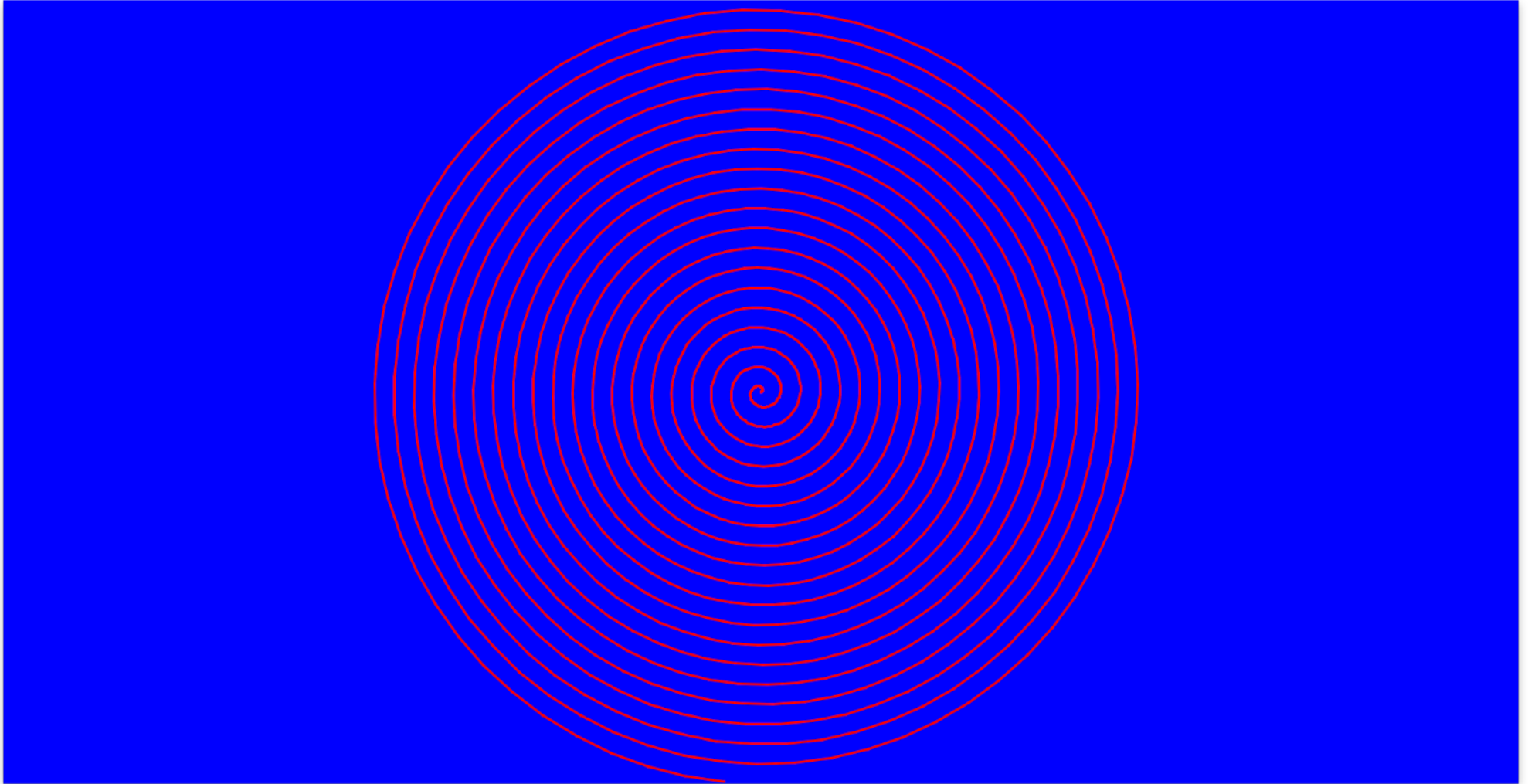
Notes

Allow to specify the number of periods of the sine function.

```
final int N = 6; // number of periods of function  $\sin(x)$ 
```

Program #8: A Spiral

Draw a spiral.



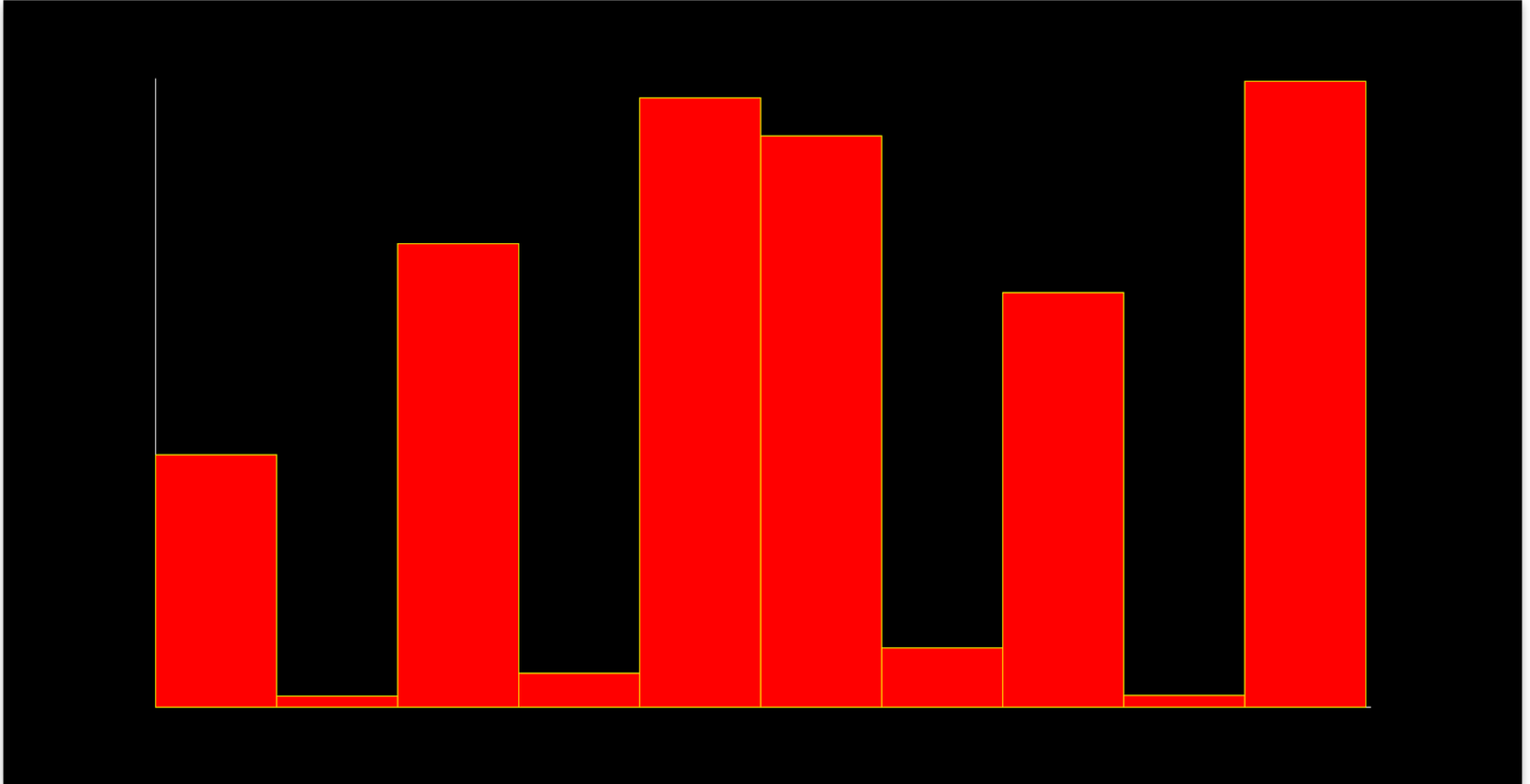
Notes

Allow to specify the number of revolutions of the spiral.

```
final int N = 20; // number of revolutions
```


Program #9: A Bar Chart

Draw a number of rectangles to create a bar chart. Show random value on the chart as rectangles of different height.



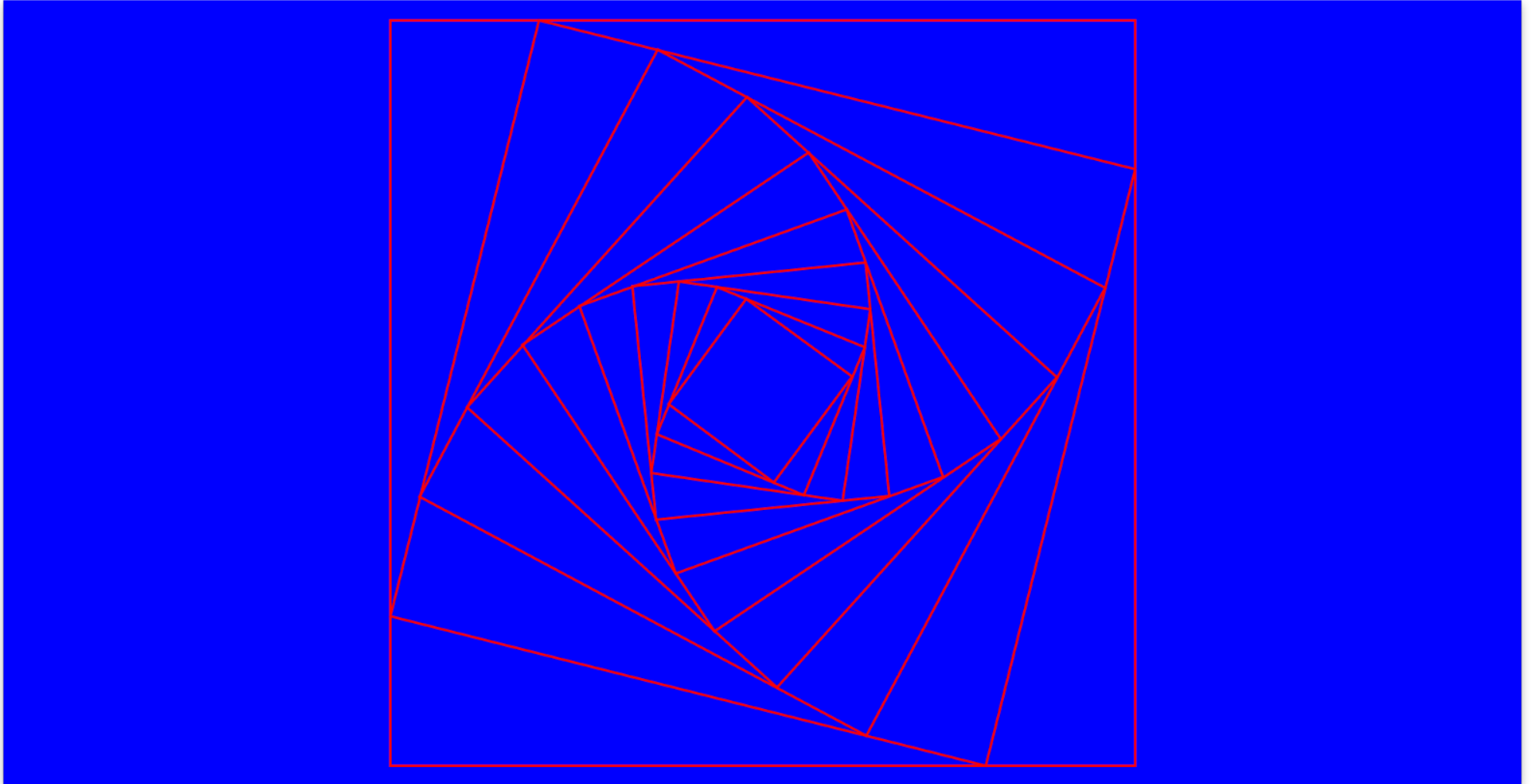
Notes

Allow to specify the number of bars. Use random values as height for each rectangle.

```
final int N = 10; // number of bars
```

Program #10: Divided Segments

Draw a number of line segments divided by a given ratio.



Notes

Allow to specify the number of segments and the ratio to divide them.

```
final int N = 10; // number of segments
```

```
final double RATIO = 0.2; // ratio
```