## Exercises week 4

## 1 Fibonacci series

The Fibonacci series is defined as:

$$
1,1,2,3,5,8,13, \ldots
$$

Namely each number (except the first two) are the sum of the previous number and the number before that.

1. Write a non-recursive Fibonacci function that calculates a given Fibonacci number. Calculate the 43rd Fibonacci number.
2. Now write a recursive function to do the same. First come up with the recursive definition.
3. It is very likely that the recursive function is much slower when calculating high values. Why is this the case?

## 2 Fractals

In this exercise, you are going to draw fractals. If you are having trouble, first try to figure out what parts of the image are replicated, how often, and where.

1. Draw the Sierpinski carpet (figure (1).
2. Draw the Spierpinksi triangle (figure 22).


Figure 1: Sierpsinki carpet


Figure 2: Sierpsinki triangle

## 3 Enemy spaceships (check assignment)

We are now going to write a class for enemy spaceships. The spaceships has these properties:

- A position
- A colour
- A constructor that sets the position and the colour
- A draw function that draws the spaceships. You can use a circle for convenience

Now do the following:

1. Write the class.
2. Draw 25 enemy spaceships in a grid on the screen.
3. If they are clicked on, make them invisible. You may need an extra class variable for this.
