Find a bit in a binary string

You are given two positive integers i and n. The binary string S_n is formed using the following formula:

- $S_1 = $ "1"
- $S_n = S_{n-1} + $ "0" $ + $ invert (reverse (S_{n-1}))   for $n > 1$

Where + denotes the concatenation operation, reverse (str) should return the reversed of string str, and invert (str) inverts all the bits in str (0 changes to 1 and 1 changes to 0). For example, the first four strings in the above sequence are:

- $S_1 = $ "1"
- $S_2 = $ "100"
- $S_3 = $ "1000110"
- $S_4 = $ "100011001001110"

Return the ith bit in S_n. Assume that i is valid for the given n.

Example 1:

```
Input: n = 3, i = 1

Output: "1"

Explanation: S₃ is "1000110".

The 1ˢᵗ bit is "1".
```

Example 2:

```
Input: n = 4, i = 11

Output: "0"

Explanation: S₄ is "100011001001110".

The 11ᵗʰ bit is "0".
```

Solve the exercise using at least one recursive method.
Use the following template in Java.
Do not change the signature of the method.
Submit only one .java file, do not zip any folder.

```java
public class FullNameSolution {
    public static char findBit(int n, int i) {

    }
}
```
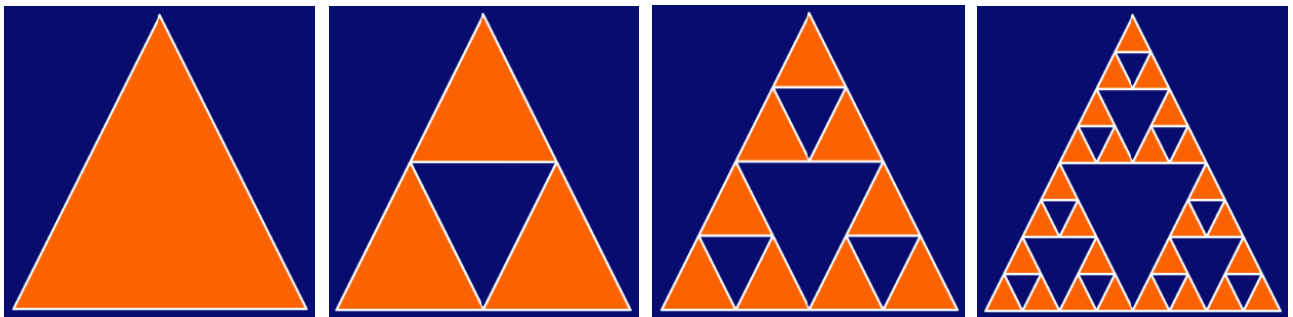
Bonus Exercise: Sierpinski triangle

Fractals are geometrical figures that if we divide them into parts, each part is a smaller copy of the whole figure. Sierpinski triangle is one of them.
To create Sierpinski triangle follow these steps:
1. Start with a simple triangle, which is Sierpinski triangle of order 1.
2. Connect the midpoints of the sides of the triangle of order 1 to create a Sierpinski triangle of order 2.
3. Do not change the center triangle. Connect the midpoints of the sides of the three other triangles to create a Sierpinski triangle of order 3.
4. To create Sierpinksi triangle of order 4, 5 … n, go over the same process recursively.

For a live demo of Sierpinski triangle, go to https://onlinemathtools.com/generate-sierpinski-sieve.
Find below Sierpinski triangles, starting from level 1 to level 4 (left to right).

Use JavaFx to display the triangles.
Ask for an input which will be the order of Sierpinksi triangle.
Do not upload the solution on Google Classroom.
This exercise is not mandatory, solve it on your own!