

Course Programming Using Java

TOPIC: NESTED LOOPS

In tasks from 1 to 5, using the branching and loop operators, write a program, whose algorithm will output geometric figures in the form of asterisks to the console (pseudographics). The faces of the figures should be smooth, the figures should be symmetrical. The height of each figure should be specified from the keyboard. You can use the output of only one asterisk in `System.out.print ("*")`.

Task 1

Rectangular triangle with a right angle down-right. Filled and empty.

```

          *
        * *
      * *
    * *
  * *
* *
*****

```

Task 2

Rectangular triangle with a right angle up-right. Filled and empty.

```

*****
*      *
 *     *
  *    *
   *   *
    *  *
     * *
      **
       *

```

Task 3

Isosceles triangle. Filled and empty.

```

      *
     * *
    *   *
   *     *
  *       *
 *         *
*****

```

Task 4

Rhombus. Filled and empty.

```

      *
     * *
    *   *
   *     *
  *       *
 *         *
*           *
*         *
 *       *
  *     *
   *   *
    * *
     *

```

Task 5

Parallelogram. Filled and empty.

```

*****
 *                               *
 *                               *
 *                               *
 *                               *
 *                               *
*****

```

Task 6

Draw a ladder on the screen. The number of steps is indicated by the user from the keyboard.

Example of a ladder of 3 steps:

```
***
*
***
*
***
```

Task 7

A positive integer of any length is entered from the keyboard. This number should be upside down, i.e., the digits should be in the reverse order (for example, enter the number 1234 – the result will be 4321).

Do not use strings and arrays.

Task 8

An integer of any length is entered from the keyboard. The program should determine and output to the console the number of digits in this number, as well as the sum of these numbers.

Task 9

It is necessary to draw a fir-tree with asterisks. Each new layer should be wider than the previous one. The number of layers and the height of the first (upper) layer of the fir-tree (the number of rows in the layer) are entered from the keyboard. The fir-tree should be symmetrical.

Example of the program:

Enter the number of layers and height with a space:

3 4

```

      *
    ***
  *****
*****
      *
    ***
  *****
*****
      *
    ***
  *****
*****
*****

```

Task 10

Write a program that will read any number (from 0 to 999999999) from the console and display its digits in the form of asterisks (*see the figure*).

Example for the number 41072819:

```

  *  *  ***  ****  ***  *  ****
 **  **  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
****  *  *  *  *  *  *  *  *
 *  *  *  *  *  *  *  *  *
  *  ***  ***  *  ****  ***  *

```