Objectives:
Practice using nested for loops.

A. Input a number \( n \) and print a grid of \( n \times n \) asterisks
For example, if the input is 4, your program should display:

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

B. Input a number \( n \) and print a grid of \( n \times n \) asterisks, with the lines labeled.
For example, if the input is 5, your program should display:

```
1   ****
2   ****
3   ****
4   ****
5   ****
```

C. Input a number \( n \) and print a triangle of \( n \times n \) asterisks, with the lines labeled.
For example, if the input is 5, your program should display:

```
1   *
2   **
3   ***
4   ****
5   *****
```

D. Input a number \( n \) and print a triangle of \( n \times n \) asterisks, upside down. The line labels should now be the number of asterisks in that line.
For example, if the input is 4, your program should display:

```
4   ****
3   ***
2   **
1   *
```
E. Input a String and print all its substrings.
Use the substring() method of the String class (see below). Hint: you will need a nested loop. For example, if the input is “abcde”, your program should display the following:

a
ab
abc
abcd
abcde
b
bc
bcd
bcde
c
cd
cde
d
de
e

Note: This is a popular problem used in tech interviews!

F. Optional:
Challenge #1: Output the Strings in order of length.
For the above example: { a, b, c, d, e, ab, bc, cd, de, abc, bcd, cde, abcd, bcde, abcde }.

Challenge #2: Without using substring() – use only charAt() to get at the characters of the String. Hint: you will need an extra nested loop – so you wind up with a triple-nested loop.

• substring

public String substring(int beginIndex, int endIndex)

Returns a new string that is a substring of this string. The substring begins at the specified beginIndex and extends to the character at index endIndex – 1. Thus the length of the substring is endIndex-beginIndex.

Examples:

"hamburger".substring(4, 8) returns "urge"
"smiles".substring(1, 5) returns "mile"

Parameters:
beginIndex - the beginning index, inclusive.
endIndex - the ending index

Returns:
the specified substring.

Throws:
IndexOutOfBoundsException - if the beginIndex is negative, or endIndex is larger than the length of this String object, or beginIndex is larger than endIndex.
Lab 10 Comments  Name:__________________________

Comments on this lab, please:

What was the most valuable thing you learned in this lab?

What did you like best about this lab?

Was there any particular problem?

Do you have any suggestions for improving this lab as an effective learning experience?