Lab Assignment 05

Pattern Generation

CSE110: Programming Language I

No of Tasks	Points to Score
15	*150*

[Submit all the Coding Tasks (Task 1 to 15) in the Google Form shared on buX.]

Rules:

- You are not allowed to use any array or String
- One only line where the word “String” may appear is in public static void main(**String** [] args) {
- The word “char” must not be anywhere in your solution

Overall hint: Imagine all outputs as a matrix of space and digit. Then count spaces and digits to find out the trend of increment or decrement of number of digits/spaces. Utilize several IF statements to control when ‘digit’ will be printed, when ‘space’ will be printed and when ‘enter’ will be printed. Nested loops may be utilized to print multiple lines.

Coding Tasks

1. Number Line

Sample Input	Sample Output
6	123456
7	1234567

2. Rectangle

Sample Input	Sample Output
4 6	123456 123456 123456 123456
8 4	1234 1234 1234 1234 1234 1234 1234 1234

3. Triangle - Left Justified

Sample Input	Sample Output
4	1 12 123 1234
6	1 12 123 1234 12345 123456

4. Triangle - Right Justified

Sample Input	Sample Output
4	4 34 234 1234
6	6 56 456 3456 23456 123456

5. Triangle - Isosceles

Sample Input	Sample Output
3	1 123 12345
4	1 123 12345 1234567

6. Rhombus

Sample Input	Sample Output
3	1 123 12345 123 1
4	1 123 12345 1234567 12345 123 1

7. Hollow Rectangle

Hint 1: Print the character space (' ') in the middle.

Hint 2: You can re-use your solution to PROBLEM 2) Rectangle and use IF condition to selectively print the first and last digit of each line and all digits of the first and last line.

Sample Input	Sample Output
4 5	12345 1 5 1 5 12345
5 4	1234 1 4 1 4 1 4 1234

8. Hollow Triangle - Left Justified

Sample Input	Sample Output
5	1 12 1 3 1 4 12345
6	1 12 1 3 1 4 1 5 123456

9. Hollow Triangle - Right Justified

Sample Input	Sample Output

5	<pre> 5
	   45
	  3 5
	 2 5
	12345</pre>

6	<pre> 6
	    56
	   4 6
	  3 6
	 2 6
	123456</pre>

10. Hollow Triangle – Isosceles

Sample Input	Sample Output
3	<pre> 1 1 3 12345</pre>
4	<pre> 1 1 3 1 5 1234567</pre>

11. Hollow Rhombus

Sample Input	Sample Output
3	<pre> 1 1 3 1 5 1 3 1</pre>

4	<pre> 1
	  1 3
	 1 5
	1 7
	 1 5
	  1 3
	   1</pre>

12. Palindrome

Sample Input	Sample Output
5	123454321
7	1234567654321

13. Palindromic Triangle

Sample Input	Sample Output
5	1 121 12321 1234321 123454321
4	1 121 12321 1234321

14. Downward Palindromic Triangle

Sample Input	Sample Output
5	123454321 1234321 12321 121 1
4	1234321 12321 121 1

15. Hourglass

Sample Input	Sample Output
5	12345 123 1 123 12345
7	1234567 12345 123 1 123 12345 1234567