

LAB ASSIGNMENT # 05

PATTERN GENERATION



CSE110 | Programming Language I

| | LAB TASKS | HOME TASKS |
|---------|-----------|------------|
| CODING | 08 | 07 |
| TRACING | 00 | 00 |

NOTE: You need to submit only the Home Tasks. Submit all the Flowchart or Tracing tasks hand drawn or handwritten, respectively to your Lab Instructors before the next lab. Submit all the Homework Coding Tasks in the Google Form shared on buX.

LAB TASKS
[NO NEED TO SUBMIT]

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.

Question: 1

Number Line

| Sample Input | Sample Output |
|--------------|---------------|
| 6 | 123456 |
| 7 | 1234567 |

Question: 2

Rectangle

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

Question: 3

Triangle - Left Justified

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

Question: 4

Triangle - Right Justified

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

Question: 5

Triangle - Isosceles

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

Question: 6

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 |

Question: 7

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 |

Question: 8

Palindrome

| Sample Input | Sample Output |
|--------------|---------------|
| 5 | 123454321 |
| 7 | 1234567654321 |

HOME TASKS

Question: 1

Rhombus

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

Question: 2

Hollow Triangle - Right Justified

| Sample Input | Sample Output |
|--------------|--|
| 5 | 5 45 3 5 2 5 12345 |
| 6 | 6 56 4 6 3 6 2 6 123456 |

Question: 3

Hollow Triangle – Isosceles

| Sample Input | Sample Output |
|--------------|----------------------------|
| 3 | 1 1 3 12345 |
| 4 | 1 1 3 1 5 1234567 |

Question: 4

Hollow Rhombus

| Sample Input | Sample Output |
|--------------|---|
| 3 | 1 1 3 1 5 1 3 1 |
| 4 | 1 1 3 1 5 1 7 1 5 1 3 1 |

Question: 5

Palindromic Triangle

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

Question: 6

Downward Palindromic Triangle

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

Question: 7

Hourglass

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

UNGRADED TASKS

Question: 1

You're a master baker at Golden Crust Bakery. Every morning, you make n loaves. But the dough must rise in stages. For each loaf, you check every 5 minutes:

- If it's not risen enough, print . (still rising).
- If it just rose, print * (ready!).
- Each loaf rises at a different minute (based on its number).

Write a program to print the rising status of the first n loaves over 20 minutes.

| Sample Input: |
|--|
| Enter number of Loaves: 3 |
| Sample Output: |
| <pre>... * * * ..</pre> |

Question: 2

You're a domino artist. You line up n dominoes in a row.

- When the first falls, it knocks the next every 1 second.
- Print the falling wave over n seconds.

| Sample Input | Sample Output |
|---------------|---|
| Enter Time: 5 | <pre>/ // /// //// /////</pre> |
| Enter Time: 8 | <pre>/ // /// //// ///// //////// ///////// /////////</pre> |

Question: 3

You're controlling the stage lights for a K-pop concert. There are 8 lights. Every second, the pattern shifts left. Print the first 8 seconds of the show. Light on = *, off = .

Sample Output

```
* * * * . . . .
* * * . . . . *
* * . . . . * *
* . . . . * * *
. . . . * * * *
. . . * * * * .
. . * * * * .
. * * * * .
* * * * . . . .
```