**Department of Computer Science and Engineering**

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| **Course Code:CSE111** | **Credits: 1.5** |
| **Course Name: Programming Language 11** | **Semester: Fall’18** |

**Lab 01  
Review of CSE110**

1. **Topic Overview:** The students will solve problems to review basic code syntax, conditional statements and loops. There are a total of 25 problems which illustrate how to create various patterns using Java programming. The programs involve usage of nested for loops (a for loop inside a for loop) to arrange stars or numbers in some logical manner.

The students will also have to solve the first 15 problems from URI Online Judge after completion of the previous tasks.

1. **Lesson Fit:**

There is pre-requisite to this lab. However, it is a practical lesson for the theory covered in the first week of course activity.

1. **Learning Outcome:**

After this lecture, the students will be able to:

* 1. Use nested loop (both while and for)
  2. Recognize pattern

1. **Anticipated Challenges and Possible Solutions**
   1. Task 4: Students will make mistake for computing the sequence printed in each line.

**Solutions:**

* + 1. The formula ‘line-lineCount-1’ should be used to print the first digit, where line is the user input and lineCount is the loop counter of the outer for loop for printing the lines.
  1. Task 21 : Students use separate conditions for printing hollow rectangle

**Solutions:**

* + 1. The conditions can simply be separated by the OR (||) logical operator.

1. **Acceptance and Evaluation**

Students will show their progress as they complete each problem. They will be marked according to their class performance. Their maybe students who might not be able to finish all 40 tasks(including URI problems), they will submit them later and give a viva to get their performance mark.

1. **Activity Detail**
   1. **Hour: 2  
      Discussion:**Explain syntax of for loop and implementation of nested loops to print a matrix. **Problem Task:**
      1. Task 1 to 25 (Page 3)
   2. **Hour: 3**

**Discussion:**

Explain how to make a URI account and submit problems to have t checked online.

**Problem Task:**

* + 1. First 15 problems from URI Online Judge

1. **Home tasks**a. Unfinished task

**Lab 1 Activity List**

PROBLEM 1) Number Line

Sample input:

6

Sample output

123456

PROBLEM 2) Rectangle

Sample input:

4

6

Sample output

123456

123456

123456

123456

Hint: 4 and 6 means 4 lines of numbers having 1..6 in each line.

PROBLEM 3) Triangle - Left Justified

Draw right angled triangle of given height

Sample input:

4

Sample output

1

12

123

1234

**Hint:** One loop for lines, another loop for printing number 1 to i when it is line i.

PROBLEM 4) Triangle - Right Justified

Draw right angled triangle of given height

Sample input:

4

Sample output

4

34

234

1234

PROBLEM 5) Triangle - Right Justified

Draw right angled triangle of given height

Sample input:

4

Sample output

1

12

123

1234

PROBLEM 6) Triangle - Isosceles

Draw triangle of given height

Sample input 1:

3

Sample output 1:

1

123

12345

Sample input 2:

4

Sample output 2:

1

123

12345

1234567

PROBLEM 7) Rhombus

Just draw the image of the above triangle once. And then, the opposite, once.

Sample input:

3

Sample output

1

123

12345

123

1

PROBLEM 8) Hollow Rectangle

Display a rectangle of given length and width.

Sample input:

4

5

Sample output

12345

1 5

1 5

12345

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 first and last star of each line and all stars of first and last line.

PROBLEM 9) Hollow Triangle - Left Justified

Draw right angled triangle of given height

Sample input:

5

Sample output

1

12

1 3

1 4

12345

PROBLEM 10) Hollow Triangle - Right Justified

Draw right angled triangle of given height

Sample input:

5

Sample output

5

45

3 5

2 5

12345

PROBLEM 11) Hollow Triangle – Isosceles

Draw triangle of given height

Sample input 1:

3

Sample output 1:

1

1 3

12345

Sample input 2:

4

Sample output 2:

1

1 3

1 5

1234567

PROBLEM 12) Hollow Rhombus

Just draw the image of the above triangle once. And then, the opposite, once.

Sample input:

3

Sample output

1

1 3

1 5

1 3

1

PROBLEM 13) Palindrome

Sample input:

5

Sample output

123454321

PROBLEM 14) Palindromic Triangle

Sample input:

5

Sample output

1

121

12321

1234321

123454321

PROBLEM 15) Star Line

Print as many stars as given in input

Sample input:

6

Sample output

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PROBLEM 16) Rectangle using solution of PROBLEM 15) Star Line

Sample input:

4

6

Sample output

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Hint: 4 and 6 means 4 lines of stars having 6 stars in each line.

PROBLEM 17) Triangle - Left Justified

Draw right angled triangle of given height

Sample input:

4

Sample output

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**Hint:** One loop for lines, another loop for printing i number of stars when it is line i.

PROBLEM 18) Triangle - Right Justified

Draw right angled triangle of given height

Sample input:

4

Sample output

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Hint: Count and print appropriate number of spaces in front of stars. Notice that there is one less space and one more star in each line.

PROBLEM 19) Triangle - Isosceles

Draw triangle of given height

Sample input 1:

3

Sample output 1:

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Sample input 2:

4

Sample output 2:

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PROBLEM 20) Rhombus using PROBLEM 19) Triangle - Isosceles

Just draw the image of the above triangle once. And then, the opposite, once.

Sample input:

3

Sample output

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PROBLEM 21) Hollow Rectangle using solution of PROBLEM 16) Rectangle

Display a rectangle of given length and width.

Sample input:

4

5

Sample output

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

Hint 2: You can re-use your solution to PROBLEM 16 and use if condition to selectively print first and last star of each line and all stars of first and last line.

PROBLEM 22) Hollow Triangle - Left Justified using solution of PROBLEM 17) Triangle - Left Justified

Draw right angled triangle of given height

Sample input:

5

Sample output

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PROBLEM 23) Hollow Triangle - Right Justified using solution of PROBLEM 18) Triangle - Right Justified

Draw right angled triangle of given height

Sample input:

5

Sample output

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PROBLEM 24) Hollow Triangle – Isosceles using solution of PROBLEM 19) Triangle - Isosceles

Draw triangle of given height

Sample input 1:

3

Sample output 1:

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Sample input 2:

4

Sample output 2:

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PROBLEM 25) Hollow Rhombus using solution of PROBLEM 20) Rhombus

Just draw the image of the above triangle once. And then, the opposite, once.

Sample input:

3

Sample output

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**26. First 15 problems from URI Online Judge (See link below) :**

**https://www.urionlinejudge.com.br/judge/en/problems/index/1**