National University of Computer and Emerging Sciences

Programming Fundamentals CS188
Laboratory Manual

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Section	BDS-1B1 & B2
Semester	FALL 2021

FAST School of Computing
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	Lab No 5		
Course Name:	**Programming Fundamentals**	**Course Code:**	
Program:	**BS(DS)**	**Semester:**	**Fall 2021**
Duration:	**3 hours**	**Total Points:**	**10 + 40 + 50**
Lab Date:	**Saturday, October 23, 2021**	**Weight**	**4%**
Section:	**BDS-1B**	**Page(s):**	

Instruction/Notes: **Cheating during the lab will result in negative marks**

Topics Covered: For Loop

Submission Instructions:

1. Save all .cpp files according to the following naming convention {ROLLNO}_{ACTIVITYNO}_{TASKNO}.cpp **FOR EXAMPLE**. 21L-XXXX_A01_P01.cpp, 21L-XXXX_A01_P02.cpp, 21L-XXXX_A02_P01.cpp

2. Now create a new folder according to the following naming convention {ROLLNO}_{LABNO} e.g. 21L-XXXX_L02

3. Move all of your .cpp files to this newly created directory and compress it into a single file.

4. Submit this compressed file on Google Classroom.

5. You will get 10 Bonus point if you will follow these instructions correctly

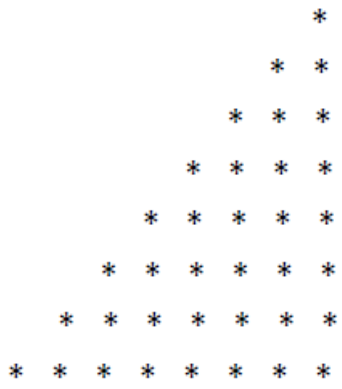
Activity No 1

Problem No 1:
The following C++ code segments can be used to print **n** spaces or **n** * on the output device/stream

Code segment to print spaces
for(int i = 0; i < n; i++) ** cout<<" ";**
Code Segment to print *
for(int i = 0; i < n; i++) ** cout<<"* ";**

Use these code segments within a loop to create programs that can print the following patterns

Filled Square of height **H** The value of H will be given by the user	Sample output for H = 8 *
Hollow Square of height **H** The value of H will be given by the user	Sample output for H = 6 *

Filled Square of height **H** The value of H will be given by the user	Sample output for H = 8 
Hollow Triangle of height **H** The value of H will be given by the user	Sample output for H = 8 

Activity No 2.

Problem No 1:

Write a C++ program to prints the first **n** terms of the following **Tick-Tock** series. The value of n is taken as input.

The first 8 terms of the **Tick-Tock** series, i.e., for **n=8** are as follows:

2 - 5 + 4 -10 + 6 - 15 + 8 - 20

Can you guess the pattern?

The odd terms are multiples of 2 and in increasing order (2, 4, 6, 8 etc.). The even terms are increasing multiples of 5 and in negative form. The terms are alternatively positive and negative. Nothing should be printed if the value of n is below 1.

For Example:
If the input is n=5, the program must print: **2 - 5 + 4 -10 + 6**
If input is n=10, the program must print: **2 - 5 + 4 -10 + 6 - 15 + 8 - 20 + 10 – 25**

Problem No 2:

Write a C++ program to prints the first **n** terms of the following Fibonacci series. The value of n is taken as input.

The first 10 terms of the **Fibonacci series**, i.e., for **n = 10** are as follows:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55

So the first two terms are 1 and 1 and every successive term is sum of the previous two terms.

For Example:
If the input is n=5, the program must print: **1, 1, 2, 3, 5.**
If input is n=10, the program must print: **1, 1, 2, 3, 5, 8, 13, 21, 34, 55.**