
CS19003 Programming and Data Structures

Assignment 3

General instruction to be followed strictly

1. Do not use any global variable unless you are explicitly instructed so.
 2. Use proper indentation in your code and comment.
 3. Name your file as <roll_no>_<assignment_no>. For example, if your roll number is 14CS10001 and you are submitting assignment 3, then name your file as 14CS10001_3.c or 14CS10001_3.cpp as applicable.
 4. Write your name, roll number, and assignment number at the beginning of your program.
 5. Make your program as efficient as possible.
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Part-I

Submit one (single) C program.

Definitions

1. A positive integer is called a PDS number if the number is equal to the sum of the factorial of its digits. For example, 1 ($1 = 1!$), 2 ($2 = 2!$), 145 ($145 = 1! + 4! + 5!$) are IIT numbers.
2. A positive integer is called a LAB number if the number is equal to the sum of its divisor except itself. For example, 6 ($6 = 1 + 2 + 3$), 28 ($28 = 1 + 2 + 4 + 7 + 14$) are KGP numbers.
3. An n-bow pattern is a pattern of height $2n - 1$, where the first row has n stars, second row has $n - 1$ stars, etc., $n - 1^{\text{th}}$ row has 2 stars, n^{th} row has 1 star, $n + 1^{\text{th}}$ row has 2 stars, etc., and $2n - 1^{\text{th}}$ row has n stars.

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*
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* * *
```

The above pattern is a 3-bow pattern.

Write a C program to perform the following tasks.

1. Take as input an integer n .
2. Print all PDS numbers from 1 to n .
3. Print all LAB numbers from 1 to n .
4. If the number n is both a PDS number and a LAB number then print an n -bow pattern.

You may need to use math library function: `#include < math.h >`
If you want to compile using the terminal then use the command
`gcc ./program.c -lm`
Proper commenting, indentation and output commands carry marks.

Policy on Plagiarism

Academic integrity is expected of all the students. Ideally, you should work on the assignment/exam consulting only the material we share with you. You are required to properly mention/cite anything else you look at. Any student submitting plagiarised code will be penalised heavily. Repeated violators of our policy will be deregistered from the course. Read this to know what is plagiarism.