CS19101 Programming and Data Structures
Nested Loop

You are not allowed to use any array or user defined function for this exercise.

Part-I

A positive integer is called an IIT number if the number is equal to the sum of factorial of its digits. For example, 1 $(1 = 1!)$, 2 $(2 = 2!)$, 145 $(145 = 1! + 4! + 5!)$ are IIT numbers.

Write a C program to perform the following tasks.

1. To check if a given positive number x is an IIT number.

2. To print all IIT numbers from 1 to a given input number n.

Part-II

A positive integer is called a KGP number if the number is equal to the sum of its divisor except itself. For example, 6 $(6 = 1 + 2 + 3)$, $28 = (1 + 2 + 4 + 7 + 14)$ are KGP numbers.

Write a C program to perform the following tasks.

1. To check if a given positive number x is a KGP number.

2. To print all KGP numbers from 1 to a given input number n.

```
   *    *    *    *    *
   *    *    *    *
   *    *    *
   *    *
   *
   *    *
   *    *    *
   *    *    *    *
   *    *    *    *    *
```

Table 1: Star K of height 9.

Part-III

Write a C program to perform the following tasks.

1. Take a positive integer n as input and output a K of height $2n - 1$ stars. A star K of height 9 is the following.

 Submit one (single) C program.

Sample Output

```
palash@palash-ThinkPad-X1-Yoga-3rd:~$ ./a.out  ./a.out
Write number x: 145
145 is an IIT number
Write number n: 1000
The IIT numbers between 1 and 1000: 1, 2, 145,
Write number x: 28
28 is a KGP number
Write number n: 1000
The KGP numbers between 1 and 1000: 6, 28, 496,
Write a positive integer n: 2
Star K of height 3 is
* *
*
* *
palash@palash-ThinkPad-X1-Yoga-3rd:~$
```