CS19101 Programming and Data Structures: Recursion

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.

We call a positive integer n a beautiful number if n is equal to the sum of its proper divisors (excluding n and including 1). For example, 6 is a beautiful number since $6 = 1 + 2 + 3$. Given an integer n as input write a program to print (i) all the proper divisors of n, (ii) is the number a prime or composite, and (iii) is the number a beautiful number or not.

You are not allowed to use any loop in today's program. Use recursion.

Submit one (single) C/C++ program.

Sample Output

```
palash@palash-ThinkPad-X1-Yoga-3rd:~$ ./a.out
Write n: 496
The proper divisors of 496 are 1, 2, 4, 8, 16, 31, 62, 124, 248,
496 is a composite number
496 is a beautiful number
palash@palash-ThinkPad-X1-Yoga-3rd:~$
```

```
palash@palash-ThinkPad-X1-Yoga-3rd:~$ ./a.out
Write n: 387
The proper divisors of 387 are 1, 3, 9, 43, 129,
387 is a composite number
387 is not a beautiful number
palash@palash-ThinkPad-X1-Yoga-3rd:~$
```

Policy on Plagiarism

Academic integrity is expected from 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.