
CS19101 Programming and Data Structures Functions

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.

Write a C program to perform the following tasks.

1. Take as input 2 positive integers a and b.
2. Write a function `digits(...)` that takes as input a positive integer and returns the number of digits in that integer.
3. Consider a positive integer of at least 3 digits. Let S be the set of digits appearing in the number, in the number multiplied by 2 and the number multiplied by 3. Suppose in S the digits from 1-9 appear exactly once while 0s may appear multiple times. Then such a number is called a *Fascinating number*.

Eg: $192 \times 1 = 192$, $192 \times 2 = 384$, $192 \times 3 = 576$.

S = 1,9,2,3,8,4,5,7,6. Therefore, 192 is a Fascinating number. Similarly, 1920 is also a fascinating number.

Write a function `isFascinating(...)` that takes as input a positive integer and returns true if it is a Fascinating number, false otherwise.

4. A positive integer of n digits is called an *Armstrong number* if the sum of the n-th power of each digit adds up to the number itself.

Eg: 153 is a 3 digit number; $153 = 1^3 + 5^3 + 3^3$

Write a function `isArmstrong(...)` that takes as input a positive integer and returns true if it is an Armstrong number, false otherwise.

5. For each integer in the range $[p, q]$, print whether it is a Fascinating number and/or an Armstrong number, or neither.
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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.