

Tutorial & Laboratory

Programming & Data Structure: CS11001/19001

Section - 4/D

DO NOT POWER ON THE MACHINE

Department of Computer Science and Engineering

I.I.T. Kharagpur

Spring Semester: 2013 - 2014 (30.01.2014)

Download

**Download the file date300114.pdf from
Programming & Data Structures ... of**

<http://cse.iitkgp.ac.in/~goutam>

**View the file using the command `acroread` & or
`xpdf` &**

Assignment V

Write a C program that will do the following three tasks after reading two distinct positive integers **lo** and **hi** ($\text{lo} < \text{hi}$). If the input data is such that $\text{lo} > \text{hi}$, then exchange them. [Marks: 5 + 7 + 8]

Note: **You write only one program.** Do not use array. Do not use any function in task I and II.

Task I

Print all the integers n in the range $[lo, hi]$, so that the product of all **non-zero** decimal digits of n divides n . Also print the count of such n 's.

Input: 20 40

Output: 20 24 30 36 40, Count: 5

$2|20, (2 \times 4)|24, 3|30, (3 \times 6)|36, 4|40$

Task II

Print all the integers n in the range $[lo, hi]$, so that $n = p_1 p_2 \cdots p_k$, $k \geq 1$, where each p_i is a **distinct prime** i.e. n is **square free**. Also print the count of such n 's.

Input: 20 40

Output: 21 22 23 26 29 30 31 33 34 35 37
38 39, Count: 13

$$21 = 3 \times 7, \cdots, 31 = 31, \cdots 39 = 3 \times 13.$$

Testing Prime

We use the simplest (not efficient) algorithm to test prime. If a positive integer n is composite, then it must have a factor $\leq \sqrt{n}$. Starting from $i \leftarrow 2$ we go up to \sqrt{n} in a loop, divide n by i , if any one i divides n , then it is composite. Otherwise, it is prime.

Task III

Write a function `int isPrime(int n)`, that takes a positive integer n as parameter. It returns `1` if n is prime; otherwise it returns `0`. Use this function to print all triple primes $(p, p + 2, p + 6)$ in the range $[lo, hi]$. Also print the count of such triplets.

Input: `10 120`

Output: `(11, 13, 17) (17, 19, 23) (41, 43, 47) (101, 103, 107) (107, 109, 113), Count: 5`

Submission by ftp

```
$ ftp 10.5.17.186
Connected to 10.5.17.186.
220----- Welcome to Pure-FTPd ----
220-You are user number 1 of 50 allowed.
220-Local time is now 07:54. .... 21.
220-IPv6 connections .....
220 ... disconnected .. inactivity.
Name (10.5.17.186:..): pds
```


Submission by ftp

```
331 User pds OK. Password required
Password: pds04
230-User pds has group access to: pds
230 OK. Current restricted directory is /
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> cd assignment5
250 OK. Current directory is /assignment5
```

Submission by ftp

```
ftp> put D0605.c
local: D0605.c remote: D0605.c
200 PORT command successful
150 Connecting to port 47093
226-File successfully transferred
226 0.001 seconds .. 39.00 Kbytes ..
27 bytes sent in 0.00 secs (1098.6 kB/s)
ftp> bye
21-Goodbye. ....
221 Logout.
$
```