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A Directi Educational Initiative

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Home » Compete » January Challenge 2015 » Queries on the String

Queries on the String

Problem code: QSET

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Read problems statements in Mandarin Chinese and Russian.

You have a string of **N** decimal digits, denoted by numbers $A_1, A_2, ..., A_N$.

Now you are given **M** queries, each of whom is of following two types.

- Type 1: **1 X Y**: Replace A_X by **Y**.
- Type 2: **2 C D**: Print the number of sub-strings divisible by 3 of the string denoted by $A_C, A_{C+1} ... A_D$.

Formally, you have to print the number of pairs **(i,j)** such that the string $A_i, A_{i+1} ... A_j$, **(C ≤ i ≤ j ≤ D)**, when considered as a decimal number, is divisible by 3.

Input

- There is only one test case.
- First line of input contains two space separated integers **N, M**.
- Next line contains a string of **N** digits, denoting string **A**.
- For next **M** lines, each line contains a query.
- Each query is given by three space separated integers.
- The first integer denotes type of the query. For each query of type 1, next two integers denote X_i, Y_i. For each query of type 2, next two integers denote C_i, D_i.

Output

For each query of type 2, print the required answer in a single line.

Constraints

- $0 \le A_i \le 9$
- $1 \le X_i \le N$
- $0 \le Y_i \le 9$
- $1 \le C_i \le D_i \le N$

Subtasks

- Subtask #1 (10 points): $1 \le N, M \le 10^3$ and only type 2 queries.
- Subtask #2 (15 points): $1 \le N, M \le 10^3$
- Subtask #3 (20 points): $1 \le N, M \le 10^5$ and only type 2 queries
- Subtask #4 (55 points): $1 \le N, M \le 10^5$

Example

Input:
5 3
01245
2 1 3
1 4 5
2 3 5

Output:
3
1

Explanation

For first query, the sub-strings S[1,1]="0", S[1,3]="012" and S[2,3]="12" are divisible by 3.
After second query, the string A becomes "01255".
For third query, only sub-string S[3,5]="255" is divisible by 3.

Author:	darkshadows
Tester:	shiplu
Date Added:	28-05-2014
Time Limit:	1 sec
Source Limit:	50000 Bytes
Languages:	ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.8.1, CPP11, CS2, D, ERL, FORT, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP clisp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYTH, PYTH 3.1.2, RUBY, SCALA, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

SUCCESSFUL SUBMISSIONS

User	Score	Mem	Lang	Solution
himanshujaju	100.000	2.8M	C++ 4.3.2	View
ng420	100.000	2.8M	C++ 4.3.2	View
nadeem_akhtar	100.000	3M	C++ 4.3.2	View
greendragons	100.000	3.1M	C	View
niyaznigmatul	100.000	3.4M	C++11	View
demover	100.000	3.4M	C++11	View
jonick	100.000	3.4M	C++ 4.8.1	View
buda	100.000	3.4M	C++11	View
stimim	100.000	3.4M	C++11	View
prinkesh	100.000	3.4M	C++ 4.8.1	View
anta0	100.000	3.4M	C++ 4.8.1	View
iafir	100.000	3.4M	C++ 4.8.1	View

1 of 91 Next »

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Comments

kishlay_raj @ *2 Jan 2015 03:06 PM*

is it necessary for the string to be consecutive?

shiplu @ *2 Jan 2015 03:30 PM*

@kishlay_raj: yes

vladamg98 @ *2 Jan 2015 04:42 PM*

Is our substring allowed to contain leading zeros?

dpraveen @ *2 Jan 2015 04:52 PM*

@vladamg98: Yes, read the samples carefully.

divyank1 @ *4 Jan 2015 09:17 PM*

awesome problem :)

Need help? Post a comment. But before that please spare a moment to read the guidelines.

Your name:
henviso

Comment: *

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Intelligent People. Uncommon Ideas.

The time now is: 10:25:24 AM
Your Ip: 199.36.244.25

CodeChef - A Platform for Aspiring Programmers

CodeChef was created as a platform to help programmers make it big in the world of algorithms, **computer programming** and **programming contests**. At CodeChef we work hard to revive the geek in you by hosting a **programming contest** at the start of the month and another smaller programming challenge in the middle of the month. We also aim to have training sessions and discussions related to **algorithms, binary search**, technicalities like **array size** and the likes. Apart from providing a platform for **programming competitions**, CodeChef also has various algorithm tutorials and forum discussions to help those who are new to the world of **computer programming**.

Practice Section - A Place to hone your 'Computer Programming Skills'

Try your hand at one of our many practice problems and submit your solution in a language of your choice. Our **programming contest** judge accepts solutions in over 35+ programming languages. Preparing for coding contests were never this much fun! Receive points, and move up through the CodeChef ranks. Use our practice section to better prepare yourself for the multiple **programming challenges** that take place through-out the month on CodeChef.

Compete - Monthly Programming Contests and Cook-offs

Here is where you can show off your **computer programming** skills. Take part in our 10 day long monthly **coding contest** and the shorter format Cook-off **coding contest**. Put yourself up for recognition and win great prizes. Our **programming contests** have prizes worth up to Rs.20,000 and $700lots more CodeChef goodies up for grabs.

Discuss

Are you new to **computer programming**? Do you need help with algorithms? Then be a part of CodeChef's Forums and interact with all our programmers - they love helping out other programmers and sharing their ideas. Have discussions around **binary search, array size, branch-and-bound, Dijkstra's algorithm, Encryption algorithm** and more by visiting the CodeChef Forums and Wiki section.

CodeChef Community

As part of our Educational initiative, we give institutes the opportunity to associate with CodeChef in the form of Campus Chapters. Hosting **online programming competitions** is not the only feature on CodeChef. You can also host a **coding contest** for your institute on CodeChef, organize an **algorithm** event and be a guest author on our blog.

Go For Gold

The Go for Gold Initiative was launched about a year after CodeChef was incepted, to help prepare Indian students for the **ACM ICPC** World Finals competition. In the run up to the **ACM ICPC** competition, the Go for Gold initiative uses CodeChef as a platform to train students for the **ACM ICPC** competition via multiple warm up contests. As an added incentive the Go for Gold initiative is also offering over Rs.8 lacs to the Indian team that beats the 29th position at the **ACM ICPC** world finals. Find out more about the Go for Gold and the **ACM ICPC** competition here.