Armenian Open Programming Contest

In memory of Vladimir Yeghiazaryan

May 24, 2020

Problems

Time limit for all problems: 1 seconds[1]
Memory limit for all problems: 256MB

Problems are not ordered by difficulty.
Do not open before the contest has started.

[1] Unless otherwise specified in the problem.

Problem A
Earthovirus

It is year 2200. Not only we have survived but you are on Mars and your mission is to isolate Mars from the only dangerous virus left in the universe: the Earthovirus. For that you have to compare the DNA of the suspected virus and the DNA of Earthovirus.

DNAs of viruses can be represented as strings composed of letters A, G, C, T. The complete DNA of Earthovirus is given by a string E of length n. Due to the radiation, the DNAs of all other viruses in the universe are uniformly random strings of arbitrary length.[2]

When the laboratory processes a virus, its DNA breaks in some places, creating multiple contiguous parts of the DNA. Furthermore, the parts that have less than 100 characters are very small and get lost. So, only some disjoint substrings $X_1, X_2, \ldots, X_k$ of test DNA remain, each at least 100 characters long. The laboratory guarantees that in total at least $n/2$ characters remain in those substrings.

You can give the laboratory some DNA-string S, and they will quickly check whether S is a substring of some X_i. You need to write a program that asks no more than such 100 questions and determines whether the test virus is an Earthovirus or no.

The interaction between your program and the laboratory.

This is an interactive problem. First, your program will need to read from the standard input the string E. After this your program needs to write in the standard output a substring S, to be checked by the laboratory. If S is a substring of X_i for some $i = 1, \ldots, k$, then your program will get an answer "Yes" in the standard input, otherwise it will receive an answer "No". If at any point your program has determined the type of the virus, it has to print either "Earthovirus" or "Marsovirus", depending on which it is. After this, your program must stop. Finally, do not forget to flush after each output.

Limits. It is guaranteed that $1 \leq n \leq 10^5$. You are not allowed to ask more than 100 questions, and the total number of characters in the DNA-strings that you ask must not exceed 10^6.

Laboratory's feedback 1	**Your questions 1**

`GATATATACATA`
 	
`...`
	
	`ATA`
	
	`...`

[2]Each character of the string is one of the four possibilities, with probability $1/4$, independently from all other characters.

General remarks about interactive problems.

- You must print a new line after each interaction;
- You must flush the output stream after each interaction:
  - In C or C++: `fflush(stdout);`
  - In Java: `System.out.flush();`
  - In Python: `sys.stdout.flush()`
  - In C#: `Console.Out.Flush();`
- Typical issues with interactive problems are
  - Wrong Answer – usually means that your program followed the interaction protocol but the answer or the intermediate steps are wrong.
  - Presentation Error – usually means that your program did not follow the interaction protocol correctly and the jury's interacting protocol is not able to test it. Note that this may happen if your output does not satisfy the required upper/lower limits of numbers.
  - Wall Time Limit Exceeded – this means that your program is not following the protocol in such a way that the interaction is not progressing. This can happen if your program is expecting an input from the jury's program by mistake; or if your program has not provided the necessary output for the jury's program to respond. The latter can happen if you do not flush the output stream.
  - Runtime error – usually a mistake in your program that makes your program crash during the execution.