Solving Problems on SPOJ   +5

How can tl   solved using BFS?

Please refresh this page to receive new updates.

Pick new people and topics to follow and see the best answers on Quora.

Update Your Interests

Answer   Request ▾   Follow **10**   Comment   Downvote

2 Answers

Lalit Kundu, Qualified for ACM-ICPC World Finals 2015
Updated Mar 27, 2016

Originally Answered: How can I solve this SPOJ problem, Problem ONEZERO?

Let's represent our numbers as strings here. Now, consider there are N states, where ith state stores the smallest string which when take modulo with N gives i. Our aim is to reach state 0. Now, we start from state "1" and at each step we have two options, either to append "0" or "1" to current state. We try to explore both the options, but note that if I have already visited a state, why would I visit it again? It already stores the smallest string which achieves that state and if I visit it again with a new string it will surely have more characters than already stored string.

Reason why we don't have to visit the same state again: Let x and y be strings, which have same state. Let x be the smaller one and z be another string which when appended to y gives us a number divisible by n. If so, then we can also append this string to x, which is smaller than y, and still get a number divisible by n. So we can safely ignore y, as the smallest result will be obtained via x only.

So, this is basically a BFS on the states. We'll visit a state atmost once, hence overall complexity is $\mathcal{O}(N)$. Interesting thing is that I need not store the whole string for each state, I can just store the value modulo N and I can easily see which two new states I am going to. I can reconstruct the string when I reach my final state if I store for each state: from where I came to that state from and through which appending(0 or 1).

6.8k Views · 45 Upvotes

👤 Add a comment...   Recommended   All

Brahma Reddy Chilakala, I know some Algorithms
Answered Aug 24, 2014

The whole problem is about finding a number which consisting of only ones and

Related Questions

Why am I not able to solve SPOJ problems?

How do we solve the following problem using BFS? Is it solvable using BFS? If so, then how?

How do you solve GAME3 problem on spoj? SPOJ.com - Problem GAME3

How do you solve SPOJ.com - Problem FSEATS on SPOJ?

How to solve square brackets problem on SPOJ(SPOJ : SQRBR)?

How can I solve the problem GCD Extreme on SPOJ? SPOJ.com - Problem GCDEX

What is the approach to solve SPOJ.com - Problem MCHAOS?

How do I solve an SPOJ.com Herding problem with a BFS flood fill algorithm?

I want to be a competitive programmer, but the problems on online competition sites such as CodeChef and HackerEarth are difficult for a begin...

How should I go about solving problems at SPOJ?

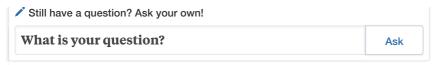➕ Ask New Question

More Related Questions

Question Stats

9 Public Followers

12,369 Views

Last Asked Aug 24, 2014

1 Merged Question

Edits

✏ Still have a question? Ask your own!

What is your question?

Ask

      2.If not multiply it with i (i=2 to infinity) and check again.

But this will take a lot of time.

Lets see backward approach.

What we are doing in the Naive Approach?

1.We multiply a positive number with input

2.And then check it consists of only ones and zeros

Lets do reverse of these steps

1.Take numbers which are only ones and zeros

2.And then check this number is multiple of given input.

This will work because we have less numbers which are only ones and zeros.

How to take numbers which are only ones and zeros?

What is the base case of our number requirement = 1

From 1 how to go to other numbers which are only ones and zeros?

From each number n(which consists of only ones and zeros) we can go to other numbers(which consists of only ones and zeros) by this formula:

  n*10, n*10+1

For Example: 1 -> 10,11 10->100,101 11->110,111 This process continues until we find a number that is multiple of the given number.

How to do this above whole process?

Here for this purpose we use BFS (Breadth First Search).

Some Optimizations:

1. We do not need to start from 1.

2. We do not need to store whole number.(confusing...Think about it)

3.4k Views · 49 Upvotes

Upvote 49   Downvote

Add a comment...   Recommended All

Top Stories from Your Feed