

Problems for Workshop

Please ask our helpful programming team if you are confused or stuck! We are happy to help :)

(Some of these problems are hosted on LeetCode or OJ.UZ, which need you to sign up for before submitting.)

1) **Guessing Game**

Guess the number. Every time you make a query, the judge will tell you if you guessed too high, too low or got the correct answer.

Link: <https://leetcode.com/problems/guess-number-higher-or-lower/>

2) **Find in a mountain array**

A mountain array is defined as an array of numbers, where there is exactly 1 mountain element. On the left hand side of the mountain element, the array is strictly increasing ($a[0] < a[1] < a[2] < \dots < a[i]$), and on the right hand side the array is strictly decreasing ($a[i] > \dots > a[n-3] > a[n-2] > a[n-1]$).

Check if an element exists in a mountain array, where you can make limited queries. Each query will require a position of the mountain array, and the judge will answer with the element at that position of the mountain array.

Link: <https://leetcode.com/problems/find-in-mountain-array/>

3) **Caves**

Interactive problem. You are in a cave that is blocked off by a sequence of N consecutive doors, that are operated by a sequence of N switches. Each of these doors corresponds to one of the switches in a random order, and the switches can be either "up" or "down". The door corresponding to each switch will only open if the switch is in the correct position ("up" or "down"), which can be different for each door.

You have up to 70000 queries, where you send a configuration of the N switches, each in an either "up" or "down" position. The judge will answer with the first closed door in this configuration (for example, if $N = 5$ and the queried sequence of switches can open the first, second, and fourth door, then the judge will answer 3 since that is the first closed door in the sequence).

Link: https://oj.uz/problem/view/IOI13_cave

4) **Combo**

Interactive problem.

Link: https://oj.uz/problem/view/IOI18_combo

5) **Prize**

Interactive problem.

Link: https://oj.uz/problem/view/IOI17_prize



6) **Data Transfer**

Communication problem.

Link: https://oj.uz/problem/view/IOI19_transfer

7) **Coins**

Communication problem.

Link: https://oj.uz/problem/view/IOI17_coins

8) **Parrots**

Communication problem.

Link: https://oj.uz/problem/view/IOI11_parrots