2020 CCPC

Qinhuangdao Site
&
WFINAL

（Warm Up）

2020 年 10 月 17 日

A. Circle

Time Limit: 1s

Memory Limit: 512M

Descriptions

There are two points A,B and an obstacle circle O on a Cartesian coordinate system.

Now, you need to choose a point C on the boundary of O, and then move both points A and B to point C. While moving, both points A and B must not be strictly inside circle O.

Your goal is to minimize the total moving distance, i.e., the sum of the moving distances of A and B.

Input Format

The first line contains a single integer $t(1\le t\le 10^6)$, representing the number of testcases.

Each testcase contains a single line with 7 integers $x1,y1,x2,y2,x3,y3,r(-1000\le x1,y1,x2,y2,x3,y3\le 1000,1\le r\le 1000)$. (x1,y1),(x2,y2),(x3,y3) are the coordinates of points A,B and the center of O respectively, and r is the radius of O.

The input guarantees that neither A nor B is strictly inside O.

Output Format

For each testcase, output a single line with a single number, the answer rounded to the third decimal place.

The input guarantees that the fourth decimal place is neither 4 nor 5.

Sample Input

```
3
0 0 2 2 1 1 1
0 0 2 2 1 0 1
0 0 2 2 1 -1 1
```

Sample Output

```
3.571
2.927
3.116
```

B. Game

Time Limit: 1s

Memory Limit: 512M

Descriptions

Alice and Bob are playing a game. There are n heaps of stones, the i-th heap contains A_i stones.

Two players play in turn (Alice first). In each turn, the player chooses 1 or 2 heaps, and for each chosen heap, removes a positive number of stones from it. The first player who is not able to make a move loses the game.

Now Bob wants to count the number of $A_{1\ldots n}$ satisfying the following conditions:

$\forall i \in [1,n], L_i \leq A_i \leq R_i$

Bob can win the game if both players play optimially.

The answer may be very large, you only need to output the answer%998244353

Input Format

The first line contains one single integer n.

Then n lines follow, the i-th line contains 2 integers L_i, R_i.

The input guarantees that $2 \leq n \leq 10,\ 0 \leq L_i \leq R_i < 2^{30}$.

Output Format

Output the answer%998244353

Sample Input

```
4
0 2
0 2
0 2
0 3
```

Sample Output

```
9
```

C. Composite Set

Time Limit: 1s

Memory Limit: 512M

Descriptions

A set of positive integer S is a composite set if and only if there is a non-empty subset T of S satisfying the sum of all integers in T is a composite number.

Given S, your task is to check whether S is a composite set.

Note: 1 is not a composite number.

Input Format

The first line contains a single integer $n(1 \leq n \leq 10^5)$.

The second line contains n integers $S_i(1 \leq S_i \leq 10^9)$, representing all numbers in S.

Output Format

If S is a composite set, output "Yes". Otherwise output "No".

Sample Input

```
2
5 7
```

Sample Output

```
Yes
```

D. 2020

Time Limit: 1s

Memory Limit: 512M

Descriptions

What's the year after n year(s) later? (0≤n≤10)

Input Format

An integer, n.

Output Format

An integer, the answer.

Sample Input

5

Sample Output

2025