Problem 2: Rock Paper Strategy!
0+10+12+14=36 Points

Problem ID: `rps`
Rank: `0+1+2+3`

Introduction

"If you know the enemy and know yourself, you need not fear the result of a hundred battles."
- *Sun Tzu, The Art of War*

Problem Statement

Play rock paper scissors against a bot running a specific program to win as many times as possible. A snippet of the source code of the program is given on the next page, but there are parts that are intentionally redacted.

Rock paper scissors is a two player game consisting of multiple rounds. In each round, both players make a move simultaneously: rock, paper, or scissors. Rock beats scissors, paper beats rock, and scissors beats paper. If your move beats your opponent's move, you win the round.

Although in actual rock paper scissors both players should move simultaneously, in this version, you'll move first, then the judge will move without considering your move for that round.

Bot Source Code

Other functions and variables may be present in the actual code but not in the snippet below.

```
function main():
    T = input_T()
    repeat T times:
        opponent.read_move();
        if opponent.last_move() == opponent.second_last_move():
            me.play(move_that_beats(opponent.last_move()))
        elif me.last_move() == me.second_last_move():
            me.play(move_that_beats(move_that_beats(me.last_move())))
        else:
            me.play(random_move())

X, A, C = get_3_random_nums_from_random.org()
M = 10 ** 9 + 7 # this is equivalent to 1000000007
q = []
function random_move():
    if q.length() == 0:
        X = (A * X + C) % M # % is the modulus operator
        temp = X
        repeat 19 times:
            q.add_to_end(temp % 3)
            temp = temp // 3 # integer division
    move = q.get_last_element()
    q.remove_last_element()
    if move == 0:
        return 'R'
    elif move == 1:
        return 'P'
    else:
        return 'S'
```

Input/Output Format

This is an interactive problem! Unlike regular problems, both your program and the judge will run simultaneously. Please refer to the contest guide for more information. Whenever you output, make sure to also flush your buffer as instructed by this post. If you have issues with buffering (or are getting time limit exceeded), please let us know via a clarification request! We'll be more than happy to help you out.

Begin by reading the first line of input containing the positive integer $\mathbf{T}$ denoting the number of test cases that follow. Each test case is a round of rock paper scissors. For each test case:

- First, output a single line containing a single character denoting your move for this round
  - This character should be one of `RPS`, representing rock, paper, or scissors respectively
- Then, read a single line of input containing a single character denoting the bot's move for this round
  - This character will be one of one of `RPS`, representing rock, paper, or scissors respectively

Constraints

$\mathbf{T} = 10^5$

Testing Test Set

This test set is impossible and is worth 0 points but serves for testing purposes. You can submit as many times as you want without accumulating any time penalty.
For this test set only, it is guaranteed that for the bot, `X`, `A`, and `C` have these values initially:
`X = 121292949, A = 653393711, C = 307210137`

Main Test Set

To pass, you must achieve a win rate of 30%.

Bonus Test Set 1

To pass, you must achieve a win rate of 60%.

Bonus Test Set 2

To pass, you must achieve a win rate of 90%.

Sample Interaction

Note that the line spacing here is to demonstrate the order in which interaction takes place only. Do not expect or output blank lines between each line of input or output.

Sample Input	Sample Output
7	
	P
P	
	S
R	
	S
S	
	S
R	
	P
R	
	S
S	
	S
P	

Sample Explanations

The judge begins by giving us $\mathbf{T}$ through the input. Note that for this sample, we have $\mathbf{T}$ = 7. The actual judge will always output $\mathbf{T}$ = 100000.

For round 1, we decide to play paper, so we output `P`. Then we read in the bot's move, which is also paper, `P`. Since we both played the same move, this round results in a draw.

For round 2, we decide to play scissors, so we output `S`. Then we read in the bot's move, which is rock, `R`. Since scissors beats rock, this round results in a loss.

For round 5, we decide to play paper, so we output `P`. Then we read in the bot's move, which is rock, `R`. Since paper beats rock, this round results in a win.

At the end of these 7 rounds, we have exactly 2 wins. This gives us a win rate of 2/7 ~= 28.5%, which means we would fail the test set just barely.