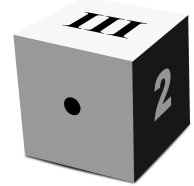


Problem A. The simplest problem about cubes

Input file: `input.txt`
Output file: `output.txt`
Time limit: 2 seconds
Memory limit: 256 MiB



Yesterday Taja visited the museum. The tour was long and interesting, but the room she liked most contained collections of the cubes of the ten famous collectors. One of the cubes has attracted her attention a lot, but she forgot, who has possessed it. Nevertheless she memorized how three visible faces looked like, as well as criteria of each of the collector. You are to deduce the name of the collectors, who could possess such a cube, from this information.

Each cube has 6 faces. Each face has a single number written on it from 1 to 6, unique for each face. Numbers can be represented either by dots, or as a decimal or as roman numeral. Also each face has one of the following colors — Black, White, Green, Yellow, Skyblue, Red, Orange and Purple.

Here is the list of the names of the collectors and their corresponding criteria, which hold for the entire collection:

John	All numbers are represented as dots
David	Numbers are never written as roman numerals
Peter	All faces are white
Robert	Faces of the cube are either black or white
Mark	Odd numbers have white background, even numbers have black background
Paul	All prime numbers are written as decimal, and vice versa
Patrick	All face have the same color, but neither black nor white
Jack	All roman numerals are on the yellow background
Max	All faces have unique colors
Alex	Numbers of the same format have the same background, different formats have different colors

Input

Input contains three lines, describing visible faces of the cube.

First symbol of i th line c_i ($c_i \in \{B, W, G, Y, S, R, O, P\}$) — the color of i th face (Black, White, Green, Yellow, Skyblue, Red, Orange and Purple correspondingly). The, separated by space, follows the number written on the face, in one of the following formats:

1. From 1 to 6 «.» symbols (ASCII 46), which means that number is written with dots and the number equals to the number of this dots;
2. Decimal number from 1 to 6;
3. Roman numeral, written with «I» (ASCII 73) and «V» (ASCII 86) symbols.

It is guaranteed, that presented cube belongs to at least one collector.

Output

Output should contain a single line with name of collectors, which can own this given cube. Names should be written in any order and separated by space.

All names of the collectors should be from the following list: John, David, Peter, Robert, Mark, Paul, Patrick, Jack, Max, Alex.

Examples

input.txt	output.txt
W .. W ... W	John David Peter Robert Jack Alex
B 2 W 3 B 6	David Robert Mark Jack
G 1 G 2 G V	Patrick
G 2 G 3 Y	David Paul Jack Alex
W . B 2 W III	Robert Mark