

# Xiao Kai's Dream of Provincial Scholarship

Input file:            standard input  
Output file:           standard output  
Time limit:           4 seconds  
Memory limit:         1024 megabytes

In the legendary magical land, there is a mysterious school. Xiao Kai is a student at this school, and recently his class is evaluating for the Excellent Student Scholarship and the Provincial Government Scholarship.

First, for each class, the allocation of Excellent Student Scholarship slots is as follows: Suppose a class has  $n$  students, then at most  $\lfloor 0.15n \rfloor$  students will receive the first prize scholarship, at most  $\lfloor 0.25n \rfloor$  students will receive the second prize scholarship, and at most  $\lfloor 0.35n \rfloor$  students will receive the third prize scholarship. (For example, in a class of 21 students, 3 students will receive the first prize scholarship, 5 students will receive the second prize scholarship, and 7 students will receive the third prize scholarship.)

Each student will have scores in three areas: academic performance, moral education, and physical education, with scores being integers in the range  $[0, 100]$ . The **comprehensive score** is the sum of the three scores. When evaluating scholarships, students will first be sorted in descending order by their comprehensive scores. If two students have the same comprehensive score, they will be sorted by their academic performance scores in descending order. If both comprehensive and academic scores are the same, they will be sorted by their names in ascending lexicographical order. The resulting ranking is referred to as the **comprehensive ranking**. The college will determine the **order of scholarship applications** based on the **comprehensive ranking**.

In addition, there is a rule that restricts the level of scholarship that students can apply for: students receiving the first prize scholarship must ensure that their **academic performance** score is in the top 25% of the class, students receiving the second prize scholarship must ensure that their **academic performance** score is in the top 45%, and students receiving the third prize scholarship must ensure that their **academic performance** score is in the top 75%. (For example, in a class of 21 students, only the top 5 students in academic performance are **eligible** to receive the first prize scholarship, the top 9 students are eligible for the second prize scholarship, and the top 15 students are eligible for the third prize scholarship. **Specially**, if two students are tied for fifth place in academic performance, both are eligible to receive the first prize scholarship.)

After the Excellent Student Scholarships for the two semesters are awarded, the college will also evaluate the Provincial Government Scholarship. The college stipulates that there are only  $m$  slots for the Provincial Government Scholarship in Xiao Kai's class. The evaluation method is to first sort by **award points** (where one first prize scholarship counts as 15 points, one second prize scholarship counts as 10 points, and one third prize scholarship counts as 5 points; for example, if student X receives one first prize scholarship and one second prize scholarship, their award points will be 25 points), then if the award points are the same, sort by the **total comprehensive score** in descending order, if the total comprehensive scores are the same, sort by the total **academic performance score** from both semesters in descending order, and if both total comprehensive scores and total academic performance scores are the same, sort by names in ascending lexicographical order.

Unfortunately, Xiao Kai was unable to win the Provincial Government Scholarship, which made him feel down. That night, he had a dream where he met an immortal sitting on a gourd, who could help him fulfill his wish of winning the Provincial Government Scholarship in his dream. The immortal can sell Xiao Kai several cups of drinks, where the first type of drink costs  $p$  gold coins and can increase Xiao Kai's academic performance score in the first semester by 1 point, and the second type of drink costs  $q$  gold coins and can increase Xiao Kai's academic performance score in the second semester by 1 point. (Note that each semester's academic performance score has a maximum limit of 100 points.)

Given that Xiao Kai's name is registered as **crazyzhk**, he now tells you all the scores of his class for the two semesters, and he wants to ask you how many gold coins he needs at a minimum to drink the purchased beverages and be able to win the Provincial Government Scholarship. If Xiao Kai cannot win

the Provincial Government Scholarship no matter what, please output “Surely next time” (without quotes) to encourage him.

What is lexicographical order:

In simple terms, lexicographical order means "the order in which words appear in a dictionary." More accurately, the algorithm to determine the order of two different strings  $S$  and  $T$  composed of lowercase letters is as follows:

Let the  $i$ -th character of  $S$  be denoted as  $S_i$ .

Define that if  $S$  is lexicographically less than  $T$ , we consider  $S < T$ , and if  $S$  is lexicographically greater than  $T$ , we consider  $S > T$ .

- Let  $L$  be the length of the **shorter** string between  $S$  and  $T$ . We check  $S_i$  and  $T_i$  for  $i = 1, 2, \dots, L$  in order.
- If there exists an  $i$  such that  $S_i \neq T_i$ , let  $j$  be the smallest  $i$  that satisfies this condition. Compare  $S_j$  and  $T_j$ . If  $S_j$  is lexicographically less than  $T_j$ , then  $S < T$ . Otherwise,  $S > T$ . The algorithm ends here.
- If there is no  $i$  such that  $S_i \neq T_i$ , then we compare the lengths of  $S$  and  $T$ . If the length of  $S$  is less than that of  $T$ , then  $S < T$ . If the length of  $S$  is greater than that of  $T$ , then  $S > T$ . If the lengths of  $S$  and  $T$  are equal, then  $S = T$ . The algorithm ends here.

## Input

The first line contains an integer  $n$  ( $6 \leq n \leq 500$ ), representing the number of students in Xiao Kai's class.

The next  $n$  lines each consist of a string  $name_i$  (composed only of lowercase letters) and six integers  $a_{i,1}, a_{i,2}, a_{i,3}, b_{i,1}, b_{i,2}, b_{i,3}$  ( $0 \leq a_{i,j}, b_{i,j} \leq 100$ ), representing the name of the  $i$ -th student, their academic performance score, moral education score, physical education score in the first semester, and their academic performance score, moral education score, physical education score in the second semester.

**It is guaranteed that each person's name is unique, and Xiao Kai's name is crazyzhk.**

The next line contains three integers  $m, p, q$  ( $0 \leq m \leq n, 0 \leq p, q \leq 100$ ), representing the number of slots for the Provincial Government Scholarship in Xiao Kai's class, the price of the first type of drink, and the price of the second type of drink.

## Output

Output a single integer representing the minimum number of gold coins Xiao Kai needs. If Xiao Kai cannot win the Provincial Government Scholarship under any circumstances, output the string “Surely next time” (without quotes).

## Examples

standard input	standard output
<pre>8 easycxk 94 12 77 74 70 55 hardzhk 80 80 95 96 20 60 crazyzhk 40 49 36 50 50 74 mike 50 98 93 36 90 23 amy 50 81 59 53 100 50 tom 50 71 69 53 90 60 john 65 73 41 60 34 69 jyy 12 26 29 29 53 50 2 44 14</pre>	1494
<pre>7 a 30 61 27 94 20 70 b 64 57 68 8 43 34 c 97 66 94 33 79 42 crazyzhk 59 6 29 55 43 53 e 65 78 61 71 31 2 f 62 25 95 60 52 44 g 60 90 30 62 42 54 2 72 22</pre>	858
<pre>8 amy 94 12 77 100 70 55 hardzhk 90 80 95 96 20 60 john 90 39 16 70 50 74 mike 100 98 93 90 90 23 easycxk 70 81 59 73 100 50 ydzlhzs 100 85 89 100 90 60 crazyzhk 65 13 11 60 14 19 jyy 92 26 29 69 53 80 2 44 14</pre>	Surely next time

## Note

In the first test case, the optimal solution is to buy 26 cups of the first type of drink and 25 cups of the second type of drink. After drinking, Xiao Kai's academic performance score in the first semester becomes 66 points, and in the second semester, it becomes 75 points.

The comprehensive ranking and scholarship situation for the first semester is as follows:

Comprehensive Ranking	Name	Academic Score	Moral Score	Physical Score	Comprehensive Score	Scholarship
1	hardzhk	80	80	95	255	
2	mike	50	98	93	241	
3	amy	50	81	59	190	
4	tom	50	71	69	190	
5	easycxk	94	12	77	183	
6	john	65	73	41	179	
7	crazyzhk	66	49	36	151	
8	jyy	12	26	29	67	

The comprehensive ranking and scholarship situation for the second semester is as follows:

Comprehensive Ranking	Name	Academic Score	Moral Score	Physical Score	Comprehensive Score	Sch
1	amy	53	100	50	203	
2	tom	53	90	60	203	
3	crazyzhk	75	50	74	199	
4	easyck	74	70	55	199	
5	hardzhk	96	20	60	176	
6	john	60	34	69	163	
7	mike	36	90	23	149	
8	jyy	29	53	50	132	

The ranking for the Provincial Government Scholarship is as follows:

Ranking	Name	Award Points	Total Comprehensive Score	Total Academic Score
1	hardzhk	25	431	176
2	crazyzhk	25	350	141
3	easyck	20	382	168
4	amy	10	393	103
5	tom	5	393	103
6	mike	5	390	86
7	john	0	342	125
8	jyy	0	199	41