Scholarship 2

Each student is considered for a scholarship at the end of the academic year. There are three types of scholarships A, B and C. Know that:

- Students who receive A scholarship must be in the group of 1/12 students with the highest GPA.
- Students who receive B scholarships must be in the group of 1/3 students with the highest GPA and not receive scholarship A.
- Students who receive C scholarships must be in the 1/2 group of students with the highest scores and not receiving scholarships A and B.
- Students with the same GPA (not rounded off) will receive or not receive the same scholarship and the number of students who receive the scholarship will not exceed the specified rate.

Compute the list of students with corresponding scholarships in descending order of scores and in ascending names.

Input

The first line contains the number of students (denoted by n) ($n \leq 10^5$).

In the next n lines, each line represents a student, including:

- Student name (including lowercase characters and no more than 20 characters)
- p number of student's subjects ($1 \leq p \leq 30$)
- p integers which are the student's subject score. Guaranteed score greater than or equal to 50

Output

List of students, including student name, GPA and scholarship type, in order of decreasing average scores and increasing names (in alphabetical order). average scores are rounded to two decimal places

Example

Input:
```
14
nam 1 56
an 1 56
ngoc 1 60
duc 1 58
khanh 1 53
vu 1 69
linh 1 50
tien 1 65
toan 2 65 64
tu 1 60
trang 1 55
son 1 55
```

canh 1 50
lam 1 55

Output:
vu 69 A
tien 65 B
toan 64.5 B
ngoc 60 C
tu 60 C
duc 58 C