F001A. Students at the FIPS — P81104_en

The Poble Sec School of Informatics stores the information of its students and the marks they have obtained in the subjects they have done in this struct:

```
struct Student {
    string name;              // Student's name
    int idn;                  // Student's IDN
    vector<Subject> subj;     // Subject list of the student
};
```

where |Subject| is:

```
struct Subject {
    string name;              // Subject's name
    double mark;              // Between 0 and 10, -1 shows NP
};
```

Using these definitions, implement the function

```
double mark(const vector<Student>& stu, int idn, string name);
```

that searches and returns the mark that the student |idn| has obtained at the subject |name|. If the student does not exist, or if he has not done the subject, or his mark is NP, the function must return -1.

You also have to implement the function:

```
double mean(const vector<Subject>& subj);
```

that calculates and returns the average mark of the subjects in the vector |subj|. To calculate the average mark, NP must be ignored. If all the marks are NP or the vector is empty, the mean mark is -1.

Using the previous functions, you must implement:

```
void count(const vector<Students>& stu, int idn, string name, int& counter);
```

that counts and sets in the output parameter |counter| the number of students in the vector |stu| that have a average mark greater than the mark that student |idn| has obtained at the subject |name|.

Precondition

There are not repeated students. In the list of subjects of each student there are not repeated subjects.

Observation

The main program is already done; do not modify it. This program reads the student's data, then prints the result of your |count()| function for each combination student-subject of the input.

Sample input 1

```
7
Helen_OConnell       12345678  4  P1 9   PHYSICS 9.5   IC 9.5   ALGEBRA 10
Michael_Martin       77777777  3  ANALYSIS 8   P1 7   IC 9
Peter_Great_Disaster 55599666  4  P1 0   PHYSICS -1   ALGEBRA 0   IC 0
Alicia_Nottoo_Bad    55511111  4  XC 5   P1 6.5   PHYSICS 5.5   IL 4
Paul_No_Registration 55544444  0
John_Smith           55533333  2  P1 9.25   PHYSICS -1
George_Calm          66666666  4  P1 -1   PHYSICS -1   IC -1   ALGEBRA -1

12345678 P1
55533333 P1
55533333 PHYSICS
55533333 PRAP
11111111 P1
```

Sample output 1

```
2
1
5
5
5
```

(In the instance, the average marks of Helen, Michael, Peter, Alicia, Paul, John and George are respectively 9.5, 8, 0, 5.25, -1, 9.25 and -1. The 2 in the output corresponds to Helen and John. The 1 corresponds to Helen. The 5 correspond to Helen, Michael, Peter, Alicia and John).

Problem information

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Generation: 2026-01-25T11:52:43.384Z