ED – exercise 12 – 2024.04.30

Evaluation

GOAL

Practice for combination-of-ADTs exam questions.

INSTRUCTIONS

Log into http://ed.fdi.ucm.es/domjudge/team with your credentials. Make sure to **submit at least 1 answer before the period ends**, even if it does not work. Before leaving the classroom, even if your program seems to work, **go by the teacher's desk** to see if it can be improved.

Problem statement

May is tough for everyone. Students will soon have exams, and teachers… teachers have to do *complicated math* to grade their students. Help your poor teacher calculate "continuous evaluation" scores for students!

Input

Input contains several lines. Each line is a command which you must implement within an Evaluator C++ class. The operations are the following:

- **add_s *sid*** – registers a student with an id. Throws EDuplicate if the student was already registered
- **add_e *eid, mandatory*** – registers an exercise with an id. Throws EDuplicate if already registered. The *mandatory* boolean determines if the exercise was mandatory or not.
- **grade *sid, g, eid*** – notes that student *sid* acheived a grade of 0 <= *g* <= 100 in exercisse *eid*. If the student was excused from the exercise, throws EExcused exception. If student or exercise not found, throws EBadArgs. An exercise may be graded several times – the last grade wins! (this happens frequently)
- **average *sid*** – if no such student, throws EBadArgs. Otherwise, adds the grades of *sid* for each exercise (divided by the maximum of those exercises); and divides this by the sum of mandatory exercises to arrive at an average grade. Output must be an integer, discarding any fractional part.
- **top *n*** – returns a list of the (at most) top *n* student ids according to their average grades (ties broken alphabetically).
- **end** – starts a new test-case, with no students or exercises.

Output

For each input line, output the corresponding output: if an exception is thrown, print its name in a line by itself. For average, show the average with 2 decimal points of precision. For Top, show the ids separated by spaces in a single line.

Example input & output

```
add_s alice
add_s eve
add_s bob
top 3
add_e e01 1
add_e e01 0
grade alice 80 e01
grade eve 81 e01
add_s bob
grade carol 70 e01
add_s carol
grade carol 70 e01
grade carol 75 e01
average carol
average alice
average bob
add_e e02 0
grade carol 10 e02
top 2
end
```

```
alice bob eve
EDuplicate
EDuplicate
EBadArgs
75
80
0
carol eve
```

Additional guidance

You ***must*** use the provided template. Your answer should be as efficient as possible, and you must include a *comment stating the worst-case asymptotic cost of your answer*.