

Problem BRICKLAYING: Brick-Laying

More and more electrical and electronic engineering (EEE) students are feeling uncomfortable to study in the well-known but rather run-down EEE twin towers while the university is building a shiny, brand-new building for the maths department right in front of them. Thus, the university decided - money is since the introduction of tuition fees no issue - to also rebuild the twin towers.

The administration also considered students' desire for more colour on the campus. Instead of building another two concrete blocks, the administration will build wonderful reddish towers made of hundreds of thousands bricks.

The actual brick-laying will be carried out by professional brick-layers. For this step the university received offers from C different brick-laying companies. Each offer contains a list with the description of N_c brick-layers working at an individual company. Each brick-layer is characterized by his individual speed s , given as integral number in bricks per hour. Since the administration wants to build the towers simultaneously they asked the companies to split their workforce in two groups, so that each group of brick-layers is building one of the towers. Obviously the brick-laying companies all agreed on this desired approach, since it is how they would have done it anyway. With their vast experience that each company gained over decades they know how to split their team into two groups so that the added up speed of workers within each group is as equal as possible. The required time to build a tower is given by the accumulated group speed and the number of bricks. If a company has no more than one single worker this company will build the towers sequentially.

The problem for the administration is however, that they don't know how the companies will split up their workforces and thus cannot decide which company will be the fastest to build the two towers. The only thing they know is that for safety and social reasons brick-layers always create groups that do not differ by more than one worker. Every worker will be assigned to a group. If one group finished its tower faster than the other group they also won't help the other group to finish the second tower.

In order to choose the best brick-laying company the administration asked the EEE students for help.

After studying all their formularies the students agreed that there is no equation to solve this problem and they would need help as well. Obviously they do not want to go to the new maths department and ask for help there. So they are asking you to compute the minimal amount of time required by each brick-laying company to build the two towers, given the mentioned constraints.

Input

The first line denotes the number of test cases $1 \leq T \leq 10$. Each test case starts with a line giving the number of companies $1 \leq C \leq 10$ and bricks per tower $10^5 \leq B \leq 10^8$. A more detailed description of each company follows in the next C lines. Each company description starts with the number $1 \leq N_c \leq 50$ of brick-layers in company c followed by N_c integral numbers describing the speed $1 \leq s \leq 180$ of each brick-layer.

Output

For each test case output C lines with the minimal time in hours, accurate up to 10^{-4} , required by each company. Output a blank line between each test case.

Sample Input 1

```
2
2 1000000
4 50 60 70 80
3 120 30 80
1 2000000
6 10 9 9 6 4 2
```

Sample Output 1

```
7692.307692
9090.909091
100000.000000
```