Woodchucking

You may remember Lea's friend Nick, the biologist. Recently, he decided to do a study at a saw mill, *Jack Lumber Inc.*, a business producing lumber. He decided to do his study on the possible productivity increase of local industries by using rodents (woodchucks, mostly). So for a few weeks, Nick got in touch with his inner lumberjack and hacked away at everything that even remotely resembled a tree (the lumberjacks quickly learned not to come too close to Nick when he was armed with an axe). Once a month, the lumberjacks had to heave all the trees onto large conveyor belts at the saw mill, where they were cut up into small pieces by huge disk saws, ready to be shipped to whoever wanted to build barstools, wooden swords, toothpicks or whatever else. There were a lot of disk saws and conveyor belts and every tree took sawing time according to its height. This meant nobody knew on which conveyor the next tree had to be put to minimize the total sawing time. So these days were mostly ending in chaos and the buzzing and sawing took quite a while.

As a scientist, Nick could not resist to try to help them and quickly devised a computer program that computed the optimal distribution of trees to the saws. It took ages to compute the value, but now the lumberjacks could chuck down the trees, then sit around for a day and then Nick guided them to cut the trees up much faster.

Unfortunately, Handsome Jack, the boss at *Jack Lumber Inc.*, really did not like the fact that his employees sat around, not chucking wood, waiting for Nick's program to spurt out some numbers. Nick tried to reason with him, but it was no use. They had to go back to the old system until Nick came up with a better idea.

Can you help him devise a faster computation that cuts up the trees in at most 50% more time than his previous solution?

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line. Each test case consists of a line containting two integers n and m. n is the amount of trees the lumberjacks felled during the course of the month, m is the amount of disk saws available. n lines follow, each containing a single integer l_i, the time it takes to cut up tree i.

Output

For each test case, output one line containing "Case #i: s" where i is its number, starting at 1, and s is at most 50% more than the minimal amount of time it takes to cut up every tree. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 2 \cdot 10^5$
- $1 \leq m \leq 1000$
- $1 \leq l_i \leq 10^5$

Sample Input 1

```
2
3 2
2
8
4

4 3
1
1
2
4
```

Sample Output 1

```
Case #1: 8
Case #2: 4
```

Sample Input 2

```
5
4 5
1
3
7
4

4 2
4
9
5
5

3 2
10
9
9

4 4
6
4
8
7

3 4
8
4
10
```

Sample Output 2

```
Case #1: 7
Case #2: 13
Case #3: 18
Case #4: 8
Case #5: 10
```