Song Popularity

You have been assigned to write software to find the best songs from different music albums contained within a given data set. At first, you figure that the most listened to songs must be the best songs. However, you quickly realize that this approach is flawed. Even if all songs of the album are equally good, the early songs are more likely to be listened to more often than the later ones, because people will tend to start listening to the first song, listen for a few songs and then stop listening. Instead, if all songs are equal, you expect that their play frequencies should follow *Zipf's Law*.

Zipf's Law is an empirical law originally formulated about word frequencies in natural languages, but it has been observed that many natural phenomena, such as population sizes and incomes, approximately follow the same law. It predicts that the relative frequency of the$i$'th most common object (in this case, a song) should be proportional to $1/i$.

To illustrate this in our setting, suppose we have an album where all songs are equally good. Then by Zipf's Law, you expect that the first song is listened to twice as often as the second song, and more generally that the first song is listened to i times as often as the i'th song. When some songs are better than others, those will be listened to more often than predicted by Zipf's Law, and those are the songs your program should select as the good songs. Specifically, suppose that song i has been played f_i times but that Zipf's Law predicts that it would have been played z_i times. Then you define the quality of song i to be $q_i = f_i / z_i$. Your software should select the songs with the highest values of q_i.

Input
The first line of input contains two integers n and m ($1 \leq n \leq 50000$, $1 \leq m \leq n$), the number of songs on the album, and the number of songs to select. Then follow n lines. The i'th of these lines contains an integer f_i and string s_i, where $0 \leq f_i \leq 10^{12}$ is the number of times the i'th song was listened to, and s_i is the name of the song. Each song name is at most 30 characters long and consists only of the characters 'a'-'z', '0'-'9', and underscore ('_').

Output
Output a list of the m songs with the highest quality q_i, in decreasing order of quality. If two songs have the same quality, give precedence to the one appearing first on the album (presumably there was a reason for the producers to put that song before the other).

Sample Input

Play Count	Song
30	One
30	Two
15	Three
25	Four

Sample Output

four
two