Problem B. Boss Rush

Input file:	standard input
Output file:	standard output
Memory limit:	512 megabytes

Finally, Little Q gets his weapon at level 10^5 in the RPG game, now he is trying to beat the boss as soon as possible. The boss has H units of health point (HP), Little Q needs to cause at least H units of damage to beat the boss.

Little Q has learnt n skills, labeled by $1, 2, \ldots, n$. Each skill can not be used multiple times, because there is not enough time for Little Q to wait for the skill to cool down. Assume Little Q uses the i-th skill at the x-th frame, the actor controlled by him will take t_i frames to perform, which means Little Q will not be allowed to use other skills until the $(x + t_i)$-th frame. The length of the damage sequence of the i-th skill is len_i, which means the skill will cause $d_{i,j}$ $(0 \le j < len_i)$ units of damage at the $(x + j)$-th frame if Little Q uses the i-th skill at the x-th frame. Note that len_i can be greater than t_i, for example, the burning skill can burn the boss for a long period, but takes a little time to cast the fire.

The game starts at the 0-th frame. Your task is to help Little Q beat the boss as soon as possible, or determine Little Q can't beat the boss using all the skills at most once.

Input

The first line contains a single integer T $(1 \le T \le 100)$, the number of test cases. For each test case:

The first line contains two integers n and H $(1 \le n \le 18,\ 1 \le H \le 10^{18})$, denoting the number of skills and the HP of the boss.

For each skill, the first line contains two integers t_i and len_i $(1 \le t_i, len_i \le 100\,000)$, the second line contains len_i integers $d_{i,0}, d_{i,1}, \ldots, d_{i,len_i-1}$ $(1 \le d_{i,j} \le 10^9)$.

It is guaranteed that the sum of all len_i is at most $3\,000\,000$, and there are at most 5 cases such that $n > 10$.

Output

For each test case, output a single line containing an integer, denoting the first frame to beat the boss. If it is impossible to beat the boss, please print "`-1`" instead.

Example

standard input	standard output
3 1 100 5 3 50 60 70 2 100 2 3 40 40 100 100 2 20 5 1 1000 1 1 999	1 2 -1