

Raising the Perfect Skeleton Army

Problem Description

Harrowhark Nonagesimus, the famous necromancer, has a perfectly reasonable plan for the week: raise a tasteful yet devastatingly effective skeleton army. Alas, bone dust is scarce, and her cavalier Gideon keeps practicing with her two-handed ultra greatsword on the femurs.

There are n distinct skeleton *types* available. Each type i requires some amount of bone dust to animate and contributes a certain combat power if included. Harrowhark wants a *diverse* army, so she will use at most one skeleton of each type.

Given the amount of bone dust available and the list of skeleton types with their power and dust cost, select a subset of types (no overlaps, each used at most once) that maximizes total combat power.

Input

The input consists of several test cases. Each test case begins with a line containing two integers

$$n \ d$$

with $1 \leq n \leq 1000$ and $1 \leq d \leq 1000$, where n denotes the number of skeleton types and d is the amount of available bone dust. Then follow n lines; the i -th line has two space-separated integers

$$p_i \ c_i$$

giving the power and bone dust cost of skeleton type i ($1 \leq p_i \leq 10000$, $1 \leq c_i \leq 1000$).

A line with `-1 -1` indicates the end of input and should not be processed.

Output

For each test case, output a single line in the format

$$P \ D$$

where P is the maximum total power achieved and $D \leq d$ is the bone dust cost of the army. That is, there exist indices $i_1 < i_2 < \dots < i_k$ of skeleton types such that the sum of powers of the said skeleton types is P and the sum of dust cost is D . There should be no set of skeleton types that can achieve higher total power with cost $\leq d$. If there are multiple ways of achieving power P , report the one that minimizes the value of D .

Samples

Sample Input 1	Sample Output 1
3 7 10 6 6 4 7 3 -1 -1	13 7

Sample Input 2
5 11
8 5
9 5
5 3
7 6
6 4
-1 -1

Sample Output 2
17 10

Sample Input 3
2 20
1 30
2 40
-1 -1

Sample Output 3
0 0