

# [D2] Trapped!!! (500 pts)

Time Limit: 1s  
Memory Limit: 512MB

## Problem Description

Wayd Blanc ist trapped inside an old mine shaft with nothing but an oxygen tank and an oxygen extractor. He knows that he could dig his way out, but that would take  $E$  seconds. Right now, his tank only has  $C$  seconds of oxygen, so he would have to find a way to get more. The atmosphere in the mine is so bad that if his oxygen tank reached zero, he would not be able to survive inside for another second.

He surveyed his surroundings. There were  $N$  different types of metal scattered within the mine, which he could collect and feed into his oxygen extractor. Digging up one unit of a certain metal  $i$  would take  $D_i$  seconds, which once processed by the extractor would generate  $G_i$  seconds of oxygen. Fortunately, there appeared to be an infinite amount of each metal.

The extractor could process as many units of any number of different metals all at once, generating the total  $G_{total}$  seconds of oxygen.  $G_{total}$  is simply the sum of oxygen produced by each type of metal used multiplied by the number of units of that metal. The extractor could be used as much as necessary, but each use would take a fixed  $P$  seconds to finish, no matter how many units of different metals are being processed. Blanc cannot dig while the extractor is processing, because he has to closely monitor the extractor. Note that it's possible to run out of oxygen exactly as the extractor is finished processing, in which case Wayd Blanc will have oxygen replenished and survive.

Help Blanc escape as quickly as possible. Determine the least amount of time needed to be spent (digging metal units and processing the extractor) in order to reach at least  $E$  seconds of oxygen.

## Input Specification

Input will begin with an integer  $T$  denoting the number of test cases.  $T$  test cases follow.

The first line in each testcase contains four space separated integers:  $C$  - the initial amount of seconds in the oxygen tank,  $E$  - the target seconds needed to escape,  $P$  - the amount of seconds needed to process the oxygen extractor, and  $N$  - the number of different metals.

$N$  lines follow containing two space separated integers each, with the  $i^{th}$  line containing:  $D_i$  - the amount of seconds needed to dig one unit of the  $i^{th}$  metal, and  $G_i$  - the amount of seconds in oxygen generated when extracting one unit of the  $i^{th}$  metal.

## Output Specification

For each test case, output a single integer which is the minimum total time to spend on digging metal units and processing them in the extractor.

If Blanc cannot generate enough oxygen to gather  $E$  seconds of oxygen, output "TRAPPED".

## Constraints

$1 \leq T \leq 10$   
 $1 \leq N \leq 1000$   
 $1 \leq C \leq 1000$   
 $C < E \leq 3000$

$$0 \leq P, D_i, G_i \leq 1000$$

### Sample Input

```
4
7 9 1 1
2 3
10 18 1 2
2 4
10 25
10 23 1 2
2 4
10 25
10 25 5 1
6 25
```

### Sample Output

```
7
12
14
TRAPPED
```

### Explanation

In the first test case, Wayd Blanc will need to dig up 3 units of the first metal (3 x 2 seconds) and use the oxygen extractor one time (1 second).

In the second test case, he will first need to dig up 4 units of the first metal (4 x 2 seconds) and use the oxygen extractor (1 second). Followed by digging up 1 more unit of the first metal (1 x 2 seconds) and using the oxygen extractor again (1 second).

In the third test case, he will need to dig up 1 unit of the first metal (1 x 2 seconds) and use the oxygen extractor (1 second). Followed by digging up 1 unit of the second metal (1 x 10 seconds) and using the oxygen extractor again (1 second).

For both the second and third test cases, even though Blanc had enough oxygen to dig up 1 unit of the second metal at the start, he would not have any oxygen left to use the extractor.

In the final test case, Blanc does not have enough initial oxygen to dig up even 1 unit of metal and still use the oxygen extractor.