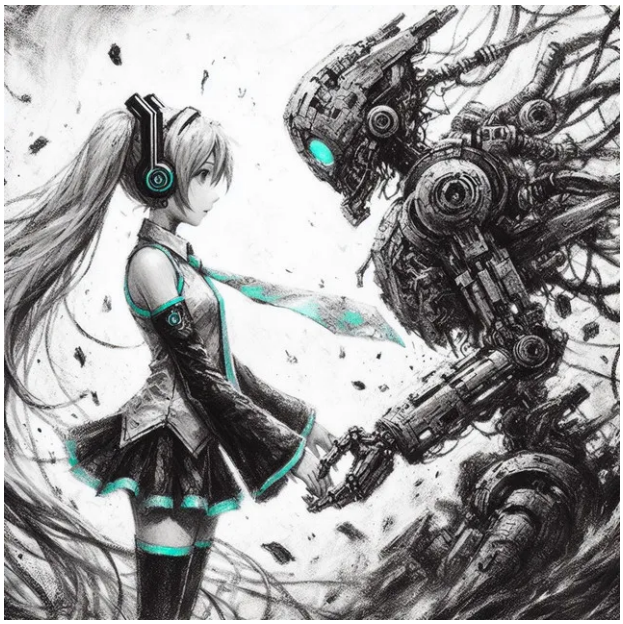
Miku vs. Machine

null_awe

1 Problem Statement



Hatsune Miku faces a machine.

Project Sekai: Colorful Stage! feat. Hatsune Miku is a Japanese mobile rhythm game featuring Vocaloid-based artists. As you may know, *Project Sekai CTF* has its namesake originally derived from this game.

Within the world of *Project Sekai*, there is a constant battle between Vocaloid artists and new music created by artificial intelligence, and many refer to this conflict as *Miku vs. Machine* (MvM).

To defeat the machines for once and for all, Miku has devised a plan for the perfect concert - m back to back shows, featuring a total of n singers ($n \leq m$).

Miku still has not decided the length of each show, but has decided that each show should be of equal length. Additionally, to ensure perfection of her concert, she wants each singer to have the same amount of stage time. In addition to that, each show may only change singers once.

Please help Miku first decide the length l of each show, then assign stage time to singers to satisfy all requirements of a perfect concert.

2 Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first and only line of every test case contains two integers n and m ($2 \le n \le m \le 2 \times 10^5$).

It is guaranteed that the sum of all m will not exceed 3×10^5.

3 Output

For each test case, output your choice of l ($2 \le l \le 10^9$) on a new line, representing the length of all the shows.

Then, for every show, on a new line, output four integers l_1, p_1, l_2, p_2, where l_1 and l_2 are the lengths of stage time for the two singers performing in that show ($0 \le l_1, l_2 \le l$, $l_1 + l_2 = l$), and p_1 and p_2 are the indices of the singers that we assign each portion of stage time to ($1 \le p_1, p_2 \le n$).

If you do not want two different singers to perform in one show, you may just output the above information with $p_1 = p_2$.

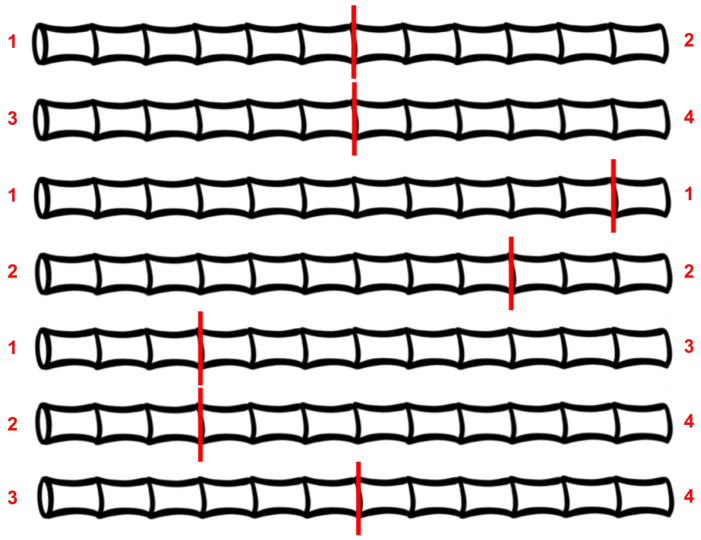
4 Samples

Sample Input 1	Sample Output 1
3 2 5 4 7 3 3	6 3 1 3 1 3 1 3 1 3 2 3 2 3 2 3 2 3 1 3 2 12 6 1 6 2 6 3 6 4 11 1 1 1 9 2 3 2 3 1 9 3 3 2 9 4 6 3 6 4 2 0 1 2 1 0 2 2 2 0 3 2 3

5 Explanation

In the first test case, we can assign two full shows to each singer, and then assign half of the last show to both singers. They will both end up with the same stage time of 15.

In the second test case, if we have $l = 12$, each singer must end up with $l(\frac{m}{n}) = 12(\frac{7}{4}) = 21$ stage time. From the first two shows, we have given each singer 6, so they must each get an addition 15 stage time. By distributing the last 5 shows as shown, all singers will end up with the same total stage time.



Distributing shows in this fashion results in equal stage time for all singers.

In the third test case, we do not need to split shows. Each singer can get their own show.