**Algorithms Advanced with C#:   
Exam Preparation – 27.09.22**

# Best Team

Link: <https://judge.softuni.org/Contests/Practice/Index/3400#0>

There are n soldiers standing in a line. Each soldier is assigned a **unique rating value**.

Your task is to find the **best team** **of soldiers** (the team with the most soldiers) amongst them under the following rule:

* All soldiers of a team are sorted in **increasing** or **decreasing order**.

If several teams with equal length exist, find the **left-most** of them.

## Input

* You will receive a line with all soldiers separated by space.

## Output

* If there is a route from the start and back to it, print the route.

## Constraints

* Ratings will be integers in the range [**0**…**1000**].
* The input will always be in valid format.
* The best team in increasing order and the best team in decreasing order will never have equal length.

## Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2 5 3 4 7 | 2 3 4 7 |
| 2 5 4 3 7 2 1 4 | 5 4 3 2 1 |

## Boxes

Link: <https://judge.softuni.org/Contests/Practice/Index/2874#1>

You're given a sequence of arrays where each array holds three integers and represents a box.

Theseintegers denote each box **width**, **depth**, and **height**, respectively. Your goal is to stack up the boxes and tomaximize the total height of the stack. A box must have a strictly **smaller width**, **depth**, and **height** than any other box below it.

Write a program that prints the boxes in the final stack, starting with the top box and ending with the bottom box. If several sequences with equal length exist, find the left-most of them.

## Input

* On the first you will receive an integer – boxes – number of boxes that you will receive.
* On the next boxes lines you will receive the width, depth, and height of a box in the following format: "{width} {depth} {height}".

## Output

* Print the boxes in the final stack, starting with the top box and ending with the bottom box.
  + Print each box in the following format: "{width} {depth} {height}".

## Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 6  2 1 2  3 2 3  2 2 8  2 3 4  1 3 1  4 4 5 | 2 1 2  3 2 3  4 4 5 |

## Water Supply System Disaster

Link: <https://judge.softuni.org/Contests/Practice/Index/2897#2>

You are given a system of pipes and **N** connecting parts. The pipes are bidirectional, so the water can flow both ways. Your task is to find the connecting part, which if blown with an explosive, will leave exactly **M** separated parts of the system.

## Input

* On the first line there will be **N** – the total number of connecting parts in the system.
  + The parts are numbered from **1** to **N**.
* On the second line there will be **M –** the separated parts of the system after the explosion.
* On the next **N** lines there will be the connections between the connecting parts.
  + List of connections (separated by a space) for the connecting parts from **1** to **N**.
    - On the first of the lines there will be connections for the first connecting part.
    - On the second – the connections of the second connecting part and so on.

## Output

* If the system is connected initially but we cannot separate it to exactly **M** parts with one explosive – print the number **0**.
* If the system is connected initially and we can separate it to exactly **M** parts – print the part, we want to explode.

## Constraints

* **N** will be an integer in the range [**2**…**1000**].
* **M** will be an integer in the range [**2**…**10**].
* There will be **only one possible solution** in all tests.

## Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| 5  2  4 5  3 5  2 5  1 5  1 2 3 4 | 5 | Diagram  Description automatically generated  If we put an explosive on 5, the system will be separated in exactly M (2) parts. |
| 5  2  5  3 5  2 5  5  1 2 3 4 | 0 | Diagram  Description automatically generated  If we put an explosive on 5, the system will be separated in 3 parts and M is 2, so we cannot separate it to exactly M parts with one explosive |