



Problem D

Conduit Packing

Input File: conduit.in

Allied Conduit Manufacturing (ACM) makes metal conduit tubes with round cross-sections that enclose many different types of wires. The circular cross-section of a wire can have a diameter up to 20 millimeters (20000 micrometers). ACM needs a program to compute the minimum diameter of a conduit that can hold 4 wires with specified diameters.

Figure 4 shows examples of fitting four wires of different sizes into conduits of minimum diameters.

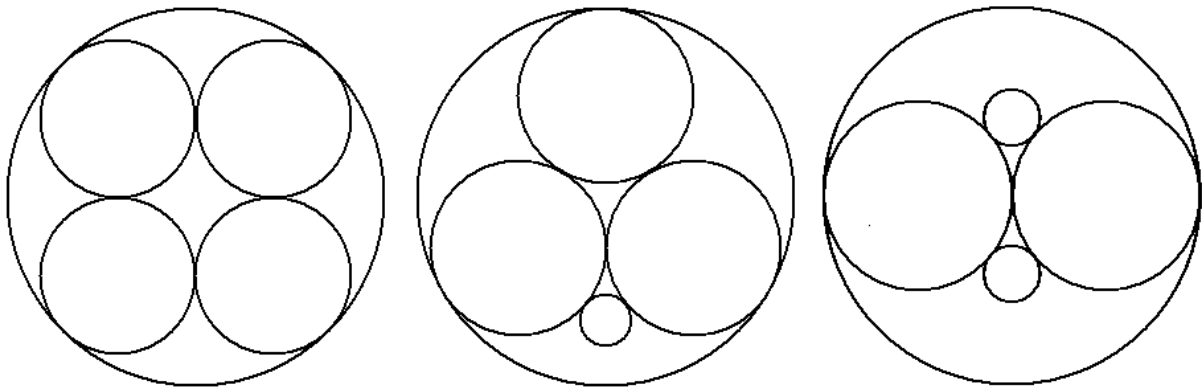


Figure 4: Fitting wires inside conduits

Your program must take the diameters of wires and determine the minimum inside diameter of the conduit that can hold the wires.

Input

The input file contains several test cases. Each test case consists of a line with four integers, $d_1, d_2, d_3,$ and d_4 , which are the diameters of the wires in micrometers. The integers satisfy $20000 \geq d_1 \geq d_2 \geq d_3 \geq d_4 > 0$. The last test case is followed by a line containing a single integer zero.

Output

For each test case, print the number of the test case (starting with 1) followed by the minimum conduit diameter in micrometers, rounded to the nearest integer. Follow the format of the sample output.

Sample Input

```
10000 10000 10000 10000
10000 10000 10000 3000
12000 12000 3600 3600
0
```

Output for the Sample Input

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Case 1: 24142
Case 2: 21547
Case 3: 24000
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