Week-14-Structures and Unions

Question 1
Correct

⚑ Flag question

You are transporting some boxes through a tunnel, where each box is a parallelepiped, and is characterized by its length, width and height.

The height of the tunnel **41** feet and the width can be assumed to be infinite. A box can be carried through the tunnel only if its height is strictly less than the tunnel's height. Find the volume of each box that can be successfully transported to the other end of the tunnel. Note: Boxes cannot be rotated.

Input Format

The first line contains a single integer **n**, denoting the number of boxes.

n lines follow with three integers on each separated by single spaces - **length$_i$, width$_i$** and **height$_i$** which are length, width and height in feet of the **i**-th box.

Constraints

1 ≤ n ≤ 100

1 ≤ length$_i$, width$_i$, height$_i$ ≤ 100
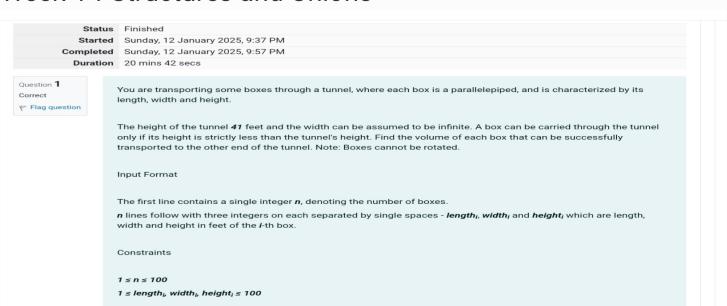
Output Format

For every box from the input which has a height lesser than **41** feet, print its volume in a separate line.

Sample Input 0

```
4
5 5 5
1 2 40
10 5 41
7 2 42
```

Sample Output 0

```
125
80
```

Explanation 0

The first box is really low, only **5** feet tall, so it can pass through the tunnel and its volume is **5 x 5 x 5 = 125**.

The second box is sufficiently low, its volume is **1 x 2 x 4= = 80**.

The third box is exactly **41** feet tall, so it cannot pass. The same can be said about the fourth box.

Answer: (penalty regime: 0 %)

```c
#include<stdio.h>
int main(){
    int n,i;
    int length,width,height;
    scanf("%d",&n);
    for(i=0;i<n;i++){
        scanf("%d %d %d",&length,&width,&height);
        if(height<41){
            printf("%d\n",length*width*height);
        }
    }
    return 0;
}
```

	Input	Expected	Got	
✓	4 5 5 5 1 2 40 10 5 41 7 2 42	125 80	125 80	✓

Passed all tests! ✓

```
3
7 24 25
5 12 13
3 4 5
```

Sample Output 0

```
3 4 5
5 12 13
7 24 25
```

Explanation 0

The square of the first triangle is **84**. The square of the second triangle is **30**. The square of the third triangle is **6**. So the sorted order is the reverse one.

Answer: (penalty regime: 0 %)

```c
1   #include <stdio.h>
2   #include <stdlib.h>
3   #include <math.h>
4   struct Triangle{
5       int a,b,c;
6       double area;
7   };
8   double calculateArea(int a,int b,int c){
9       double p=(a+b+c)/2.0;
10      return sqrt(p*(p-a)*(p-b)*(p-c));
11  }
12  int compareTriangles(const void*x,const void*y){
13      struct Triangle*t1=(struct Triangle*)x;
14      struct Triangle*t2=(struct Triangle*)y;
15      return(t1->area > t2->area)-(t1->area < t2->area);
16  }
17  int main() {
18      int n,i;
19      scanf("%d",&n);
20      struct Triangle triangles[n];
21      for(i=0;i<n;i++){
22          scanf("%d %d %d",&triangles[i].a,&triangles[i].b,&triangles[i].c);
23          triangles[i].area=calculateArea(triangles[i].a,triangles[i].b,triangles[i].c);
24      }
25      qsort(triangles,n,sizeof(struct Triangle),compareTriangles);
26      for(i=0;i<n;i++){
27          printf("%d %d %d\n",triangles[i].a,triangles[i].b,triangles[i].c);
28      }
29      return 0;
30  }
```

	Input	Expected	Got	
✓	3 7 24 25 5 12 13 3 4 5	3 4 5 5 12 13 7 24 25	3 4 5 5 12 13 7 24 25	✓

Passed all tests! ✓