SAISANJAY SS 2024-CSE S2

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.

Answer: (penalty regime: 0 %)

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

Question **2**
Correct
Flag question

You are given ***n*** triangles, specifically, their sides a_i, b_i and c_i. Print them in the same style but sorted by their areas from the smallest one to the largest one. It is guaranteed that all the areas are different.

The best way to calculate a volume of the triangle with sides ***a***, ***b*** and ***c*** is Heron's formula:

$S = \sqrt{p * (p - a) * (p - b) * (p - c)}$ where $p = (a + b + c) / 2$.

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
#include <math.h>
#include <stdlib.h>

typedef struct{
    int a,b,c;
    double area;
}triangle;

double calculate_area(int a,int b,int c)
{
    double p=(a+b+c)/2.0;
    return sqrt(p*(p-a)*(p-b)*(p-c));
}
int compare(const void *t1,const void *t2)
{
    triangle *tri1=(triangle*)t1;
    triangle *tri2=(triangle*)t2;
    if(tri1->area < tri2->area)
    return -1;
    if(tri1->area > tri2->area)
    return 1;
    return 0;
}
int main()
{
    int n;
    scanf("%d",&n);
    triangle triangles[n];
    for(int i=0;i<n;i++)
    {
        int a,b,c;
        scanf("%d %d %d",&a,&b,&c);
        triangles[i].a=a;
        triangles[i].b=b;
        triangles[i].c=c;
        triangles[i].area=calculate_area(a,b,c);
    }
    qsort(triangles,n,sizeof(triangle),compare);
    for(int i=0;i<n;i++)
    {
        printf("%d %d %d\n",triangles[i].a,triangles[i].b,triangles[i].c);
    }
    return 0;
}
```

	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! ✓