Programming Fundamentals Exam with Python

10 March 2019

Submit your solutions in the SoftUni judge system at https://judge.softuni.bg/Contests/Practice/Index/1511#0

Four problems for 4 hours.

Problem 1. Listmon's delivery problem

Listmon is a delivery guy. He should deliver a barrels with a mystic liquid. He has got a truck but he is not good at math so he asks you to help him.

You have a task to estimate how many barrels can be transported with the single truck. The shape is **rectangular parallelepiped** and the barrel's shape always will be **circular cylinder**.

If at some point **the truck get full**, you should **stop** receiving barrels data and print

„Truck is full.{*count_of_barrels*} on board!".

Where the *count_of_barrels* are the barrels you have succesfuly loaded up.

If you have succesfully **loaded up all barrels** without breaking up the program you should print –

„All barrels on board.Capacity left - {*volume_of_truck*}."

where the *volume_of_truck* is the free volume space has left.Where the volume is **formatetd up to 2 digit after decimal point**.

Input

You will recieve on the first 3 lines:

- **a – width of the truck [floating number]**
- **b – depth of the truck [floating number]**
- **c – height of the truck [floating number]**

On the next line you will recieve

- **n - number of barrels [integer number]**

For each barrel tou will receive:

- **r - radius of the barrel [floating number]**
- **h - height of the barrel [floating number]**

Output

If you have loaded up all barrels you should print

- `"All barrels on board. Capacity left - {volume_of_truck}."`

  `Formatted two digits after decimal point.`

`If you have no space left in the truck you should print`

- `"Truck is full. {count_of_barrels} on board!"`

Example input/output

Вход	Изход	Обяснения

300 150 200 6 100 100 100 100 100 100 100 100 100 100 100 100	Truck is full. 2 on board!	We should estimate the volume of the truck – 300*150*200 = 9 000 000. We know we will receive 6 barrels. For each barrel we estimate its volume - pi*r*r*h = V -> 3.141592653589793 * 100*100*100 = 3141592.653589793. Now we have the volume of the first barrel. We should check if there is enough space for it = 9 000 000 - 3141592.653589793 = 5858407.346410207. We have enough space. So we now have one barrel. We continue doing that and we see that the second barrel fits two. So now we have two on board. We received the data for the third one. We check if there is enough space – so far we left with 2716814.692820414truck space -> 2716814.692820414 - 3141592.653589793 = **-424777.960769379**. Here we see that the truck has no capacity for the third one so we left just with two barrels, print the result and stop reading barrel's data.
100 100 50 2 20 40 30 60	All barrels on board. Capacity left - 280088.51.	