Nearest Square

DiPS CodeJam 22

Prompt

Given an array of n integers, find the nearest squares of all the integers.

Input Format

The first and only line of input contains a space-separated array of n integers.

Output Format

The first and only line of your output must contain a single a space-separated array of n integers.

Constraints

- $2 \leq n \leq 100$

- $1 \leq \text{integer} \leq 1000$

Sample Input/Output

Input	Output
748 253 142	729 256 144

Solution

Let's take a random number, say **125**. Now, to obtain the 2 nearest squares, we find the squares of $\lfloor \sqrt{125} \rfloor$ and $\lfloor \sqrt{125} \rfloor + 1$:

$$\lfloor \sqrt{125} \rfloor^2$$
$$= \lfloor 11.18033\ldots \rfloor^2$$
$$= 11^2$$
$$= 121$$

$$(\lfloor \sqrt{125} \rfloor + 1)^2$$
$$= (\lfloor 11.18033\ldots \rfloor + 1)^2$$
$$= (11 + 1)^2$$
$$= 12^2$$
$$= 144$$

As 121 is closer to 125, that's our answer.

Sample Program

```python
import math

arr = list(int(e) for e in input().split())
outputContent = []
for i in range(0,len(arr)):
    sr = math.floor(math.sqrt(arr[i]))
    a = sr * sr
    b = (sr + 1) * (sr + 1)
    outputContent.append(a) if ((arr[i] - a) < (b - arr[i])) else outputContent.append
    (b)

print(" ".join(str(e) for e in outputContent))
```