Programming I — Laboratory Sessions

Week 11: Inheritance

Geometric Shapes

Task description

Write a program that reads a sequence of data about geometric shapes (rectangles, squares, and circles) and a command and produces the output depending on the command.

Input

The first line of the input contains an integer $n \in [1, 10^3]$. There follow n lines with the data about individual geometric shapes. The last line contains an integer $u \in \{1, 2, 3\}$. Each of the n lines that specify the shape data describes a rectangle, a square, or a circle and takes the following form (depending on the type of the shape):

- Rectangle (*pravokotnik* in Slovenian):

  `1` *sideLengthA sideLengthB*

- Square (*kvadrat* in Slovenian):

  `2` *sideLength*

- Circle (*krog* in Slovenian):

  `3` *radius*

All data items are integers from the interval $[1, 10^3]$.

Output

The expected output depends on the command (the number u):

- In the case of $u = 1$, print the data about individual shapes, together with their areas and circumferences. Follow the example presented later.
- In the case of $u = 2$, print the data about the shape with the maximum area. If there are multiple such shapes, choose the first of them.
- In the case of $u = 3$, print the data about all rectangles and squares.

All areas and circumferences should be rounded to the nearest integer.

Test case 1

Test input:

```
6
2 10
3 50
1 20 30
2 60
1 10 50
3 40
1
```

Expected output:

```
kvadrat [a = 10] | p = 100, o = 40
krog [r = 50] | p = 7854, o = 314
pravokotnik [a = 20, b = 30] | p = 600, o = 100
kvadrat [a = 60] | p = 3600, o = 240
pravokotnik [a = 10, b = 50] | p = 500, o = 120
krog [r = 40] | p = 5027, o = 251
```

Test case 2

Test input:

```
6
2 10
3 50
1 20 30
2 60
1 10 50
3 40
2
```

Expected output:

```
krog [r = 50] | p = 7854, o = 314
```

Test case 3

Test input:

```
6
2 10
3 50
1 20 30
2 60
1 10 50
3 40
3
```

Expected output:

```
kvadrat [a = 10] | p = 100, o = 40
pravokotnik [a = 20, b = 30] | p = 600, o = 100
kvadrat [a = 60] | p = 3600, o = 240
```

```
pravokotnik [a = 10, b = 50] | p = 500, o = 120
```