Session 2 worksheet

Names:

The set of practice problems will always be somewhat larger: don’t worry if you don’t reach the end.

0. Select a group

In Moodle, please select an empty group and add yourself and your partner to it. Make sure that you and your partner register to the same group. You will submit today’s work together as a group.

1. Power line

Show and explain your solution of power line exercise (homework exercise 3) to your partner. How did you arrive to your solution? Discuss and write below: what are the most important differences in your solutions?

Do your programs work correctly? Test your programs exhaustively. Note that autograder doesn’t cover all possible test cases. Can you think a set of inputs where your partner’s program gives wrong answer (think about extreme or special cases)? If you find errors, please correct them. Write how many errors you found in each other’s programs.

Was your partner’s code easily understandable? What recommendations would you give to your partner to write more understandable code?

Modify and improve

Write a program that computes the number of poles when the power line should be circular (first and last poles are the same).

2. Python documentation

Recall the functions floor and ceil you studied in the homework and use them with some “vivid” arguments that demonstrate the difference of these functions from simple rounding. Fill in the cells of the table on the following page (the first row has already been filled).

Select another two interesting functions from the math module and fill the last four rows of the table in a similar way (you may also try the constants tau and inf as arguments).

Hint: the documentation about the math module is here: http://docs.python.org/3/library/math.html.
### Function values

<table>
<thead>
<tr>
<th>Function name</th>
<th>Argument</th>
<th>Function value</th>
</tr>
</thead>
<tbody>
<tr>
<td>floor</td>
<td>13.3</td>
<td>13</td>
</tr>
<tr>
<td>floor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ceil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ceil</td>
<td></td>
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</tbody>
</table>

| 3. Pizza price |

Write a program that prompts the user for the diameter and the price of the pizza. The program then calculates the price of a square centimeter of the pizza in cents and prints out the result.

What is the diameter of your pizza? 20
How many euros does it cost? 5
One square centimeter of your pizza costs 1.5915494309189533 eurocents

Now imagine that somebody asks you to write a program that computes the price of one unit of area of the pizza that has different shape other than round. Write in your own words what needs to be changed in your program if:

- we need to calculate the price per square inch instead of square centimeter
- the shape of the pizza is rectangular instead of round

| 4. Students |

At the beginning of school year, the program manager splits the students into practical session groups. The manager has to distribute the students between the classes as equally as possible. Write a program that asks the manager for the number of available classrooms and the number of students. The program outputs the number of students in each classroom.

Example 1

Enter the number of students: 103
Enter the number of rooms: 15
You will need to put 7 students in each of 13 classes.
You will need to put 6 students in each of 2 classes.
Example 2

Enter the number of students: 80
Enter the number of rooms: 4
You will need to put 20 students in each of 4 classes.

Test your program with the following inputs:
- Number of students 100, number of rooms 20
- Number of students 50, number of rooms 7
- Number of students 1050, number of rooms 45

Write below: what do you think, why were these values chosen to test the program?

5. Mourning frame

Write a program that asks the user for person's first name, last name, birth date and death date and prints out this data, drawing a frame around it.

For example, if the data is:

Lennart
Meri
Mar 29, 1929
Mar 14, 2006

then the output should be something like this (let your fantasy fly):

+---------------------------------+
|                                 |
|          Lennart Meri           |
|                                 |
|   Mar 29, 1929 - Mar 14, 2006   |
|                                 |
+---------------------------------+

Write a short summary of the algorithm you used to get the frame printed around the data.

At the end of session

Please submit your programs in Moodle as a group.

There is no autograder for practice session programs, so use your partner’s help effectively to debug and test your solutions.