

Dear colleagues, regarding our last meeting, please find below extensive details regarding how to grade the first Homework for CS101.

- If needed, please also find again the few slides asking these problems.

- There is a lot of details in this email, please try to read, practice and understand all of it, *if you think you need it*.

What deadline?

Let us try to have ALL the grades by **next Wednesday**, so we can try to give back the homework as soon as possible (on the next lab, next week), before the first Mid-Term exam.

Who grades what?

- I take my two groups (**A1, A4**: I have all the answers),
 - Prof. Vipin takes his two groups (**A2, B2**: he still have to collect the last answers),
 - Prof. Thiyagarajan (assisted by Prof. Kondaiah) takes two of his groups (**A3, B4**, still have to collect B4 tomorrow, A3 next Monday),
 - Prof. Arya and Prof. Vivek takes the last groups (**B1, B3**, still have to collect B1 next Monday).
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Marking scheme to follow

Please find attached two examples of answer papers, corrected in red color by me, and scanned. I propose the following marking scheme (can be modified if you think it needs to) :

- 20 total marks.
- 3 marks for Pb1, 6 marks for Pb2, 3 marks for Pb3, 5 marks for Pb4, and 2 marks for Pb5 + 1 bonus point.

In details, I suggest this:

Problem 1:

- 1 mark for input values x, y
- 1 mark for $x_{min} < x < x_{max}$ and $y_{min} < y < y_{max}$
- 1 mark for the good output (“Inside” or “Outside”)

Problem 2 (the harder):

- 1 mark for the good input for x, y
- 3 marks for how to compute the equation of the line $(ax + by + c)$ / the z-component of the cross product $(\overrightarrow{PQ} \times \overrightarrow{PA}) \cdot \vec{z}$ (cf. my last email for more math. details about that test)
- 2 marks for the correct output regarding the sign of $ax + by + c$ (if they used the equation of the line) / of the cross product (be sure to check if they did not mess up the sign and the direction, printing left when it should be right or the opposite)

Problem 3:

- 1 mark for computing the distance with the good math formula ($d = \sqrt{(x - x_c)^2 + (y - y_c)^2}$)
- 2 marks if the three cases of the output are good (on the circle if $d = r$, outside if $d > r$, inside if $d < r$)

Problem 4:

- 2 marks for explicitly computing the 3 equations for AB, BC, CA / or computing the z-component of three different cross-product.
- 2 marks if they say which values have to be positive for the point to be inside the rectangle
- 1 mark for the good output

Problem 5:

- 2 marks, as you like. Basically, 2 if they did it in a way you understand, 0 otherwise.

Bonus !

Finally, I suggest a last +1 point if the student did good drawings and/or a good presentation.

More details about the solutions, and their respective Python programs

If you need more detail about the solution, please find attached one Python program that solves each problem; or in the .zip archive file, one file for each problem.

(You should be able to execute it on your laptop, or on any on-line Python 2 interpreter, as repl.it/languages/Python or pythontutor.com/visualize.html).

Practice your Python!

For example, for the problem 1, please consult the page <http://repl.it/9NX> for all the problems.

Or click on these links: <http://goo.gl/xwN89a> for a visual demo of the execution of the program for problem 1. <http://goo.gl/rIFW8p> for problem 2, or <http://goo.gl/3m6Wg1> for problem 3, <http://goo.gl/UH6pjZ> for problem 4, and <http://goo.gl/Wkdoq4> for problem 5.

How / Where to input the grades?

As discussed, let us try the built-in feature of Moodle for this. Please go to that page (www.mahindraecolecentrale.edu.in/portal/grade/report/grader/index.php?id=27) as soon as you are done grading your group(s). Then, log-in with usual id/password, select your group, and click on “Turn editing on”. Finally, you can add all the grades for your group, and click on save.

- If this fails, we will go back to using a basic XL sheet.
 - If you lost your ID or password, I will create a new one for you.
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Happy grading !

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Lilian

Included solution for problems 1 and 2

Problem 1

```
1 xmin, xmax = -100, 100
2 ymin, ymax = -100, 100
3
4 x, y = input("x, y = ?")
5
6 if (xmin <= x <= xmax) and (ymin <= y <= ymax):
7     print "Yes, the point P is indeed inside!"
8 else:
9     print "No, the point P is not inside."
```

Problem 2

```
1 def isLeftOrRight(p=(0, 0), q=(0, 1), a=(1, 1)):
2     return ((q[1] - p[1]) * (a[0] - p[0])) - ((q[0] - p[0]) * (a[1] - p[1]))
3
4 xP, yP = input("For P: xP, yP = ?")
5 xQ, yQ = input("For Q: xQ, yQ = ?")
6 xA, yA = input("For A: xA, yA = ?")
7
8 check_for_A = isLeftOrRight(p=(xP, yP), q=(xQ, yQ), a=(xA, yA))
9
10 if check_for_A == 0:
11     print "A is on the line (P, Q)."
```

```
12 elif check_for_A > 0:
13     print "A is on the 'left' of the line (direction from P to Q)."
```

```
14 elif check_for_A < 0:
15     print "A is on the 'right' of the line (direction from P to Q)."
```

```
16 else:
17     print "Huhu... Weird case (not supposed to happen)!"
```