

Homework #1

Given by: Prof. Dhaude

When: 13th / 01

Exercise 1

Solution in English:

- 1) Let $x_{min} \leq x_{max}$, $y_{min} \leq y_{max}$,
with x_{min} , x_{max} , y_{min} , $y_{max} \in \mathbb{R}$.
- 2) Input a point $P(x, y)$: $x \in \mathbb{R}$
 $y \in \mathbb{R}$
- 3) If $x_{min} \leq x \leq x_{max}$
and $y_{min} \leq y \leq y_{max}$:
- 4) Then P is in the workspace,
- 5) Else P is not in the workspace.

And that is enough.

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Exercise 1

Approximate Python code

(a program file is on Moodle)

```

1 xmin, xmax = -100, 100
2 ymin, ymax = -100, 100
3 print "Please give the point P:"
4 x = input("Coordinate x = ")
5 y = input("Coordinate y = ")
6 # We use the "if" keyword to test:
7 if (ymin ≤ y ≤ ymax) and (xmin ≤ x ≤ xmax):
8     print "Point P is in the workspace!"
9 else:
10    print "Point P is outside the workspace."

```

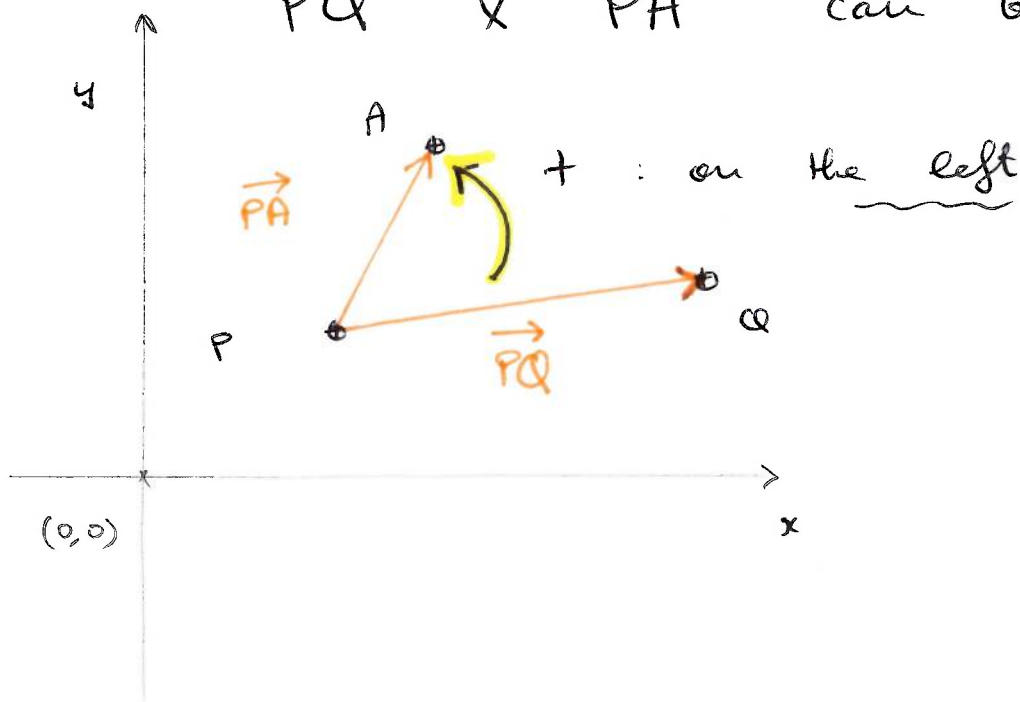
(indentation, at least one space)

Note: This Pythonic way to do a test,
 (a "if" loop) will be explained by
 Prof. Anya on the next lecture.

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Exercise. 2 & 4

Hint: to easily check if A is on, on the left or on the right of the line (P, Q) , remember that the z coordinate of the cross product $\vec{PQ} \times \vec{PA}$ can be useful.



Reference: More details on the Internet:

<https://en.wikipedia.org/wiki/>

→ Cross-product # Computational
→ geometry

on Wikipedia

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Exercise 5

Solution in English:

- 1) Input an integer k ($k \in \mathbb{N}$)
- 2) Let $m = 1$.
- 3) While $m < 2 * k$ do:
- 4) | print m
- 5) | $m \leftarrow m + 2$ (increment m by 2)

One way to write it with Python:

```

1 k = input("Give me an integer: k = ")
2 m = 1
3 while m < 2 * k :
4     → 4 print m
5     → 5 m = m + 2

```

(indentation)

Prof Anya will explain
more about while
loops.

The syntax $m += 2$
is also possible.

Remarks: we will see other approaches, like:

```
print " ".join([str(i) for i in xrange(1, 2 * k, 2)])
```