# Exercice 1

## Orientation2D

Do a determinant 3x3 and return 1 if the result is bigger than 0, return 0 if result is 0 or return -1 if result is less than 0.

## ClassifyIntersection

Use a orientation2D to check if point is in left or right of line.

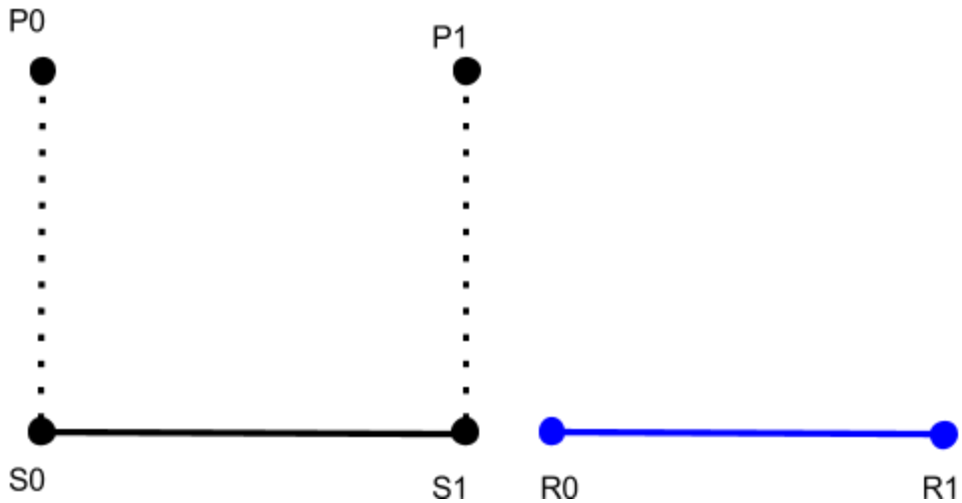
The process of the algorithm is the follow:

First check the two points of a one segment with the line formed with points of the other segment, and we can have the next cases:

- The points are in the left and right of line, I check that the others points of the other segments with the line of the first segment, and if the points are in the left and right the segment cross, else I have 0 is because one point is in the segment. Else the segment don't cross.

- If one point is in the line (I check the two points). I check that the other points, and obtain if the point is in the segment, is equal than other point or don't cross.

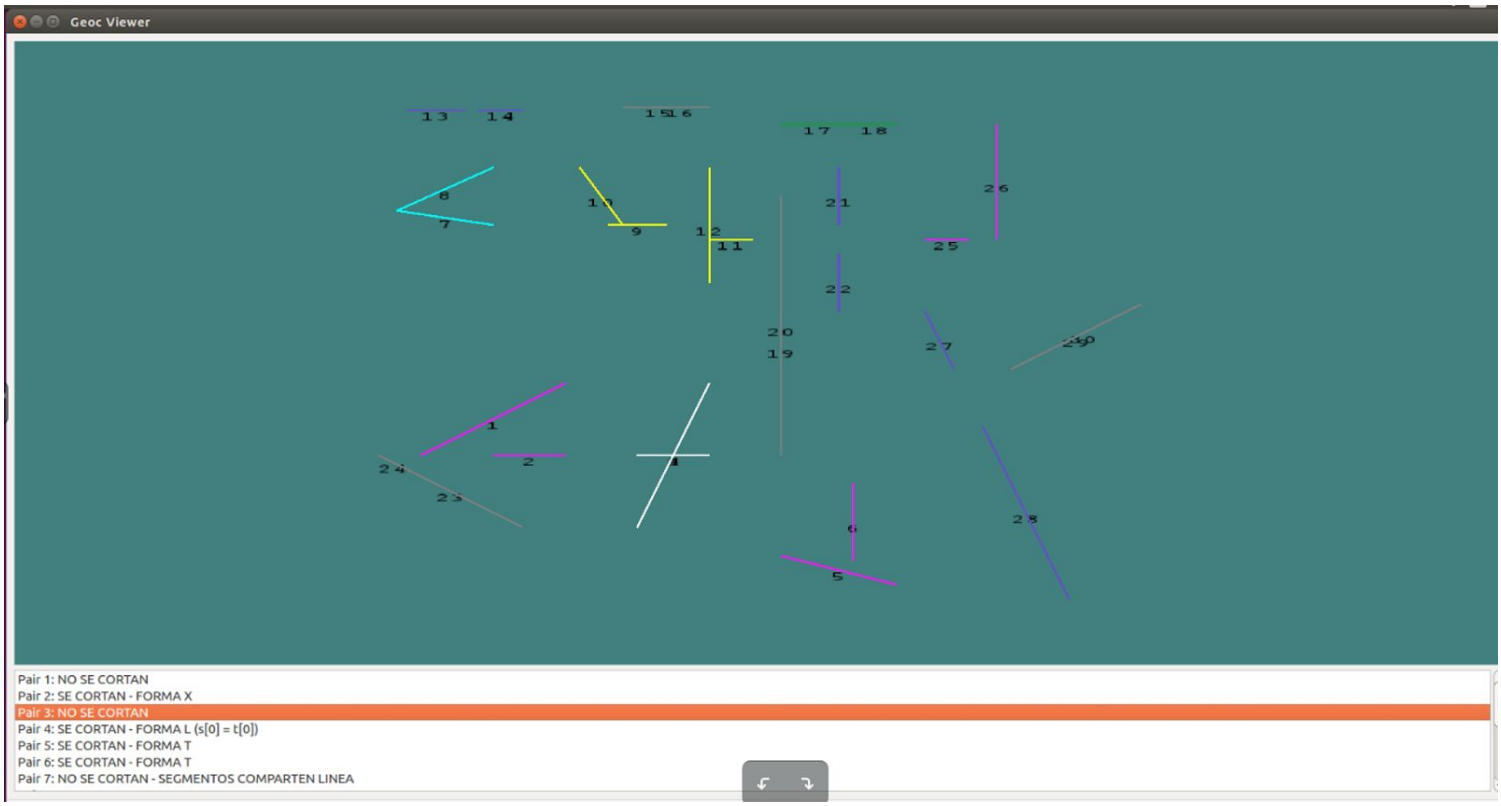
- All points are in the same line I create a 2 parallel auxiliary points and check the position of the others points respect these:



Checking the relative position between P0-S0 line and S1, R0, R1, and the relative position with P1-S1 line and S0, R0, R1 using orientation2D, I found that if the segments are the same or S1 and R0 are the same or S0 and R1 are the same or the segment are join or the segments are disjoints.

- The segments don't cross.

## Solution




Pair 1: NO SE CORTAN
Pair 2: SE CORTAN - FORMA X
Pair 3: NO SE CORTAN
Pair 4: SE CORTAN - FORMA L (s[0] = t[0])
Pair 5: SE CORTAN - FORMA T
Pair 6: SE CORTAN - FORMA T
Pair 7: NO SE CORTAN - SEGMENTOS COMPARTEN LINEA
Pair 8: SEGMENTOS SOLAPADOS
Pair 9: SEGMENTOS COMPARTEN VETICE - SEGMENTOS COMPARTEN LINEA
Pair 10: SEGMENTOS SOLAPADOS
Pair 11: NO SE CORTAN - SEGMENTOS COMPARTEN LINEA

Pair 12: SEGMENTOS SOLAPADOS
Pair 13: NO SE CORTAN
Pair 14: NO SE CORTAN - SEGMENTOS COMPARTEN LINEA
Pair 15: SEGMENTOS SOLAPADOS