Problem name: Big Circle

Language: English

Solution

This was the easiest task on the first day of competition. The task was about to find two nearest points on circle. It's not hard to see that two nearest points will be two consecutive points when we have clockwise (or anticlockwise) order of them.

There are many ways to find that order and here we will present two of them:

- Let the P be the bottommost point (i.e. point with minimal y coordinate). Sort all points by angle which forms x axis and line defined by that point and point P. To do this easily we can sort only by tangent of that angle (which is calculated by formula $(T.y - P.y) / (T.x - P.x)$ where T is the point we observe). After that we can just calculate the distance between every two consecutive points in sorted array and print the minimal one.
- Let the P be the leftmost point (i.e. point with minimal x coordinate). Make "upper chain" and "lower chain" in the following way: if the point T is "above" point P (i.e. has grater y coordinate) then add it to upper chain, and if the point T is "below" point P then add it to lower chain. Then we should sort points in upper chain and lower chain by x coordinate and after that it is enough to check the distance between consecutive points in those chains. Also, we should calculate the distance between two endpoints of chains. This solution is slightly easier for coding.