CS133 Lab 3 – Convex Hull

Objective

- Compute the Convex Hull of a set of Points on a plane using Graham Scan Algorithm.

Detailed Requirements

You are required to implement the set of data types and operations described below as functions and test them on the examples provided.

Data type

Create a Point class which has two double-precision floating point attributes named x and y.

Functions

- `std::vector<Point> ConvexHull (std::vector<Points>& points)`
  Compute the convex hull of a set of n points. Returns the list of the points on the convex hull sorted in CCW order. If multiple collinear points are on the convex hull boundary, the function should return all of them.

Feel free to add any supporting functions as you see appropriate.

Examples

Test your code on the following test cases.

Example 1

Input: {{0, 3}, {1, 1}, {2, 2}, {4, 4},{0, 0}, {1, 2}, {3, 1}, {3, 3}}
Expected output: (0, 0),(3,1),(4,4),(0,3)

Example 2

Input: {{0, 3}, {2, 2}, {1, 1}, {2, 1}, {3, 0}, {0, 0}, {3, 3}}
Output: …

Example 3

Input: {{3, 1}, {2, 3}, {2, 4},{2, 5}, {3, 7}, {1, 2}, {1, 6}}
Output: …