

Implement the Jarvis march, the Graham scan, the Andrew's monotone chain; the quickhull with and without integer points elimination.

Measure the runtime of each algorithm with the same inputs, containing 1k, 10k, 100k, 1M, 2M, 5M points. Consider different disposition for the points in the inputs:

- random points in a circle
- random points in the border of a circle
- random points in a rectangle
- random points in the border of a rectangle
- random points inside a region limited by a parabola
- random points on a parabola.

Make a table comparing the runtimes.

2. implement a function that decides if there are intersections in a set of line segments

3. implement a function that compute the 2 closest points in a given set of N points, with $1 \leq N \leq 1000000$

4. Calculate the area covered by N rectangles, $1 \leq N \leq 1000000$

5. (optional, difficult) Which is the minimum number of "flood" operations necessary transform an image into monochromatic?