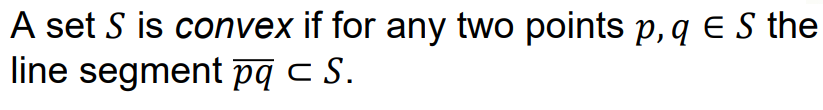
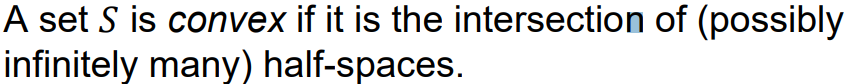
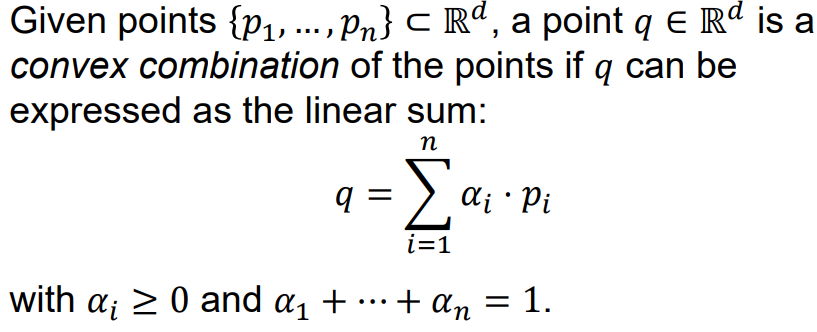
# 工程中的计算几何与图算法

## 点集合凸包（Convex Hulls）

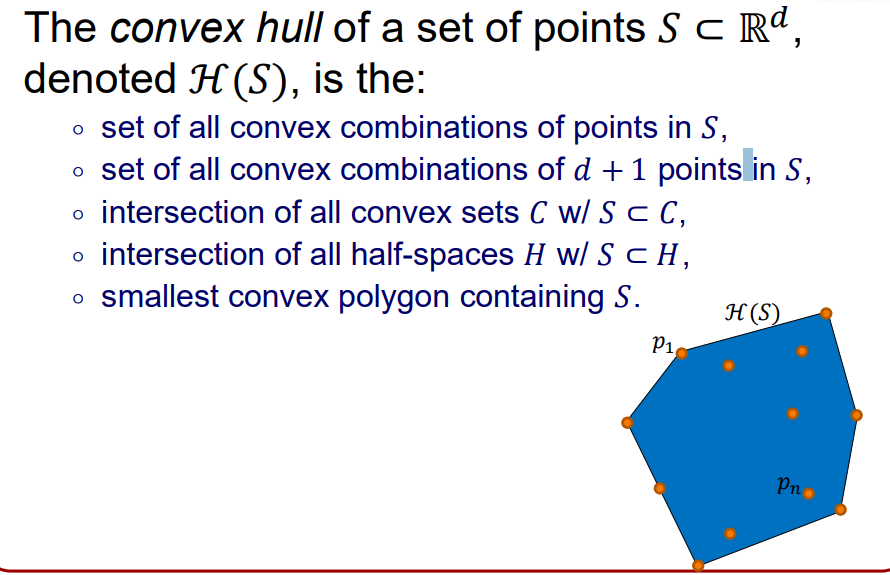
### Convexity

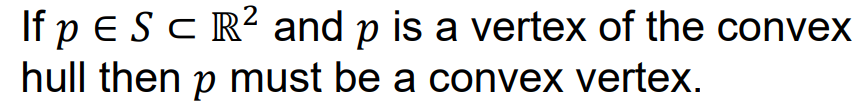


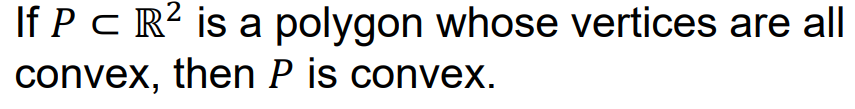


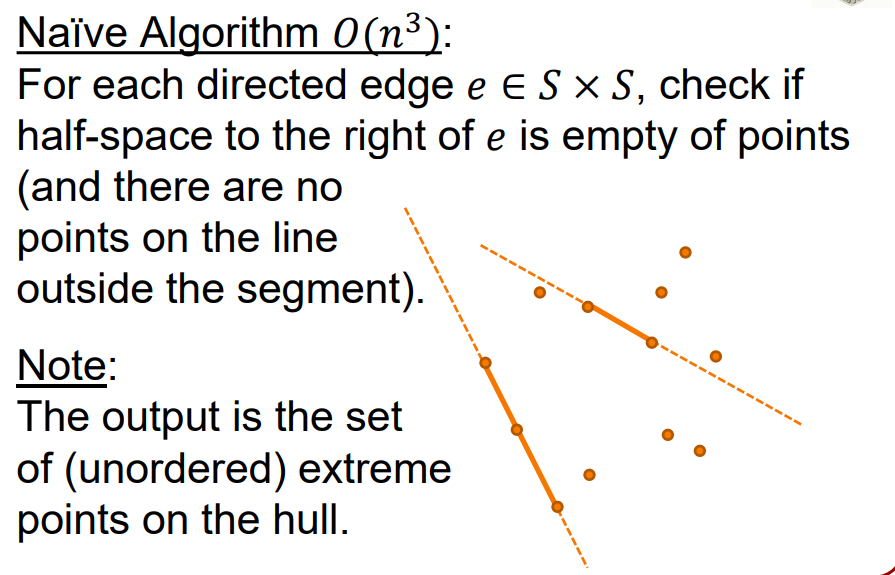


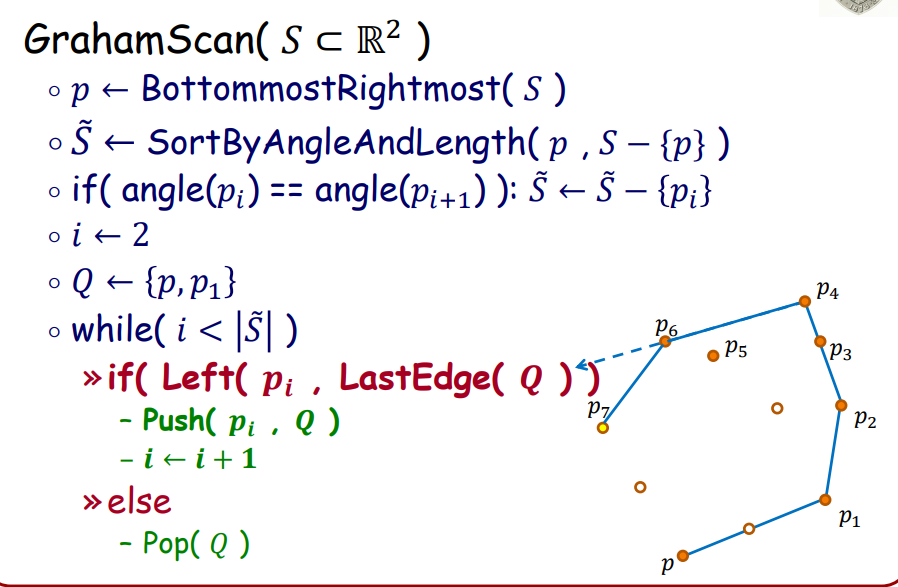
### Convex Hull

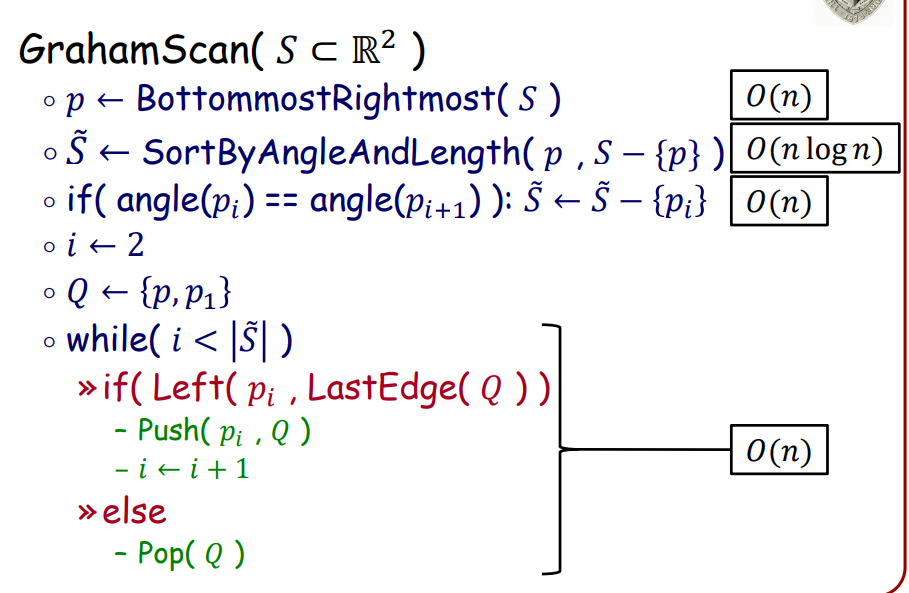


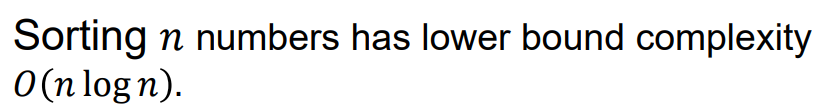












Tips：

快速排序时间复杂度平均是O(nlgn)但最坏是O(n^2)

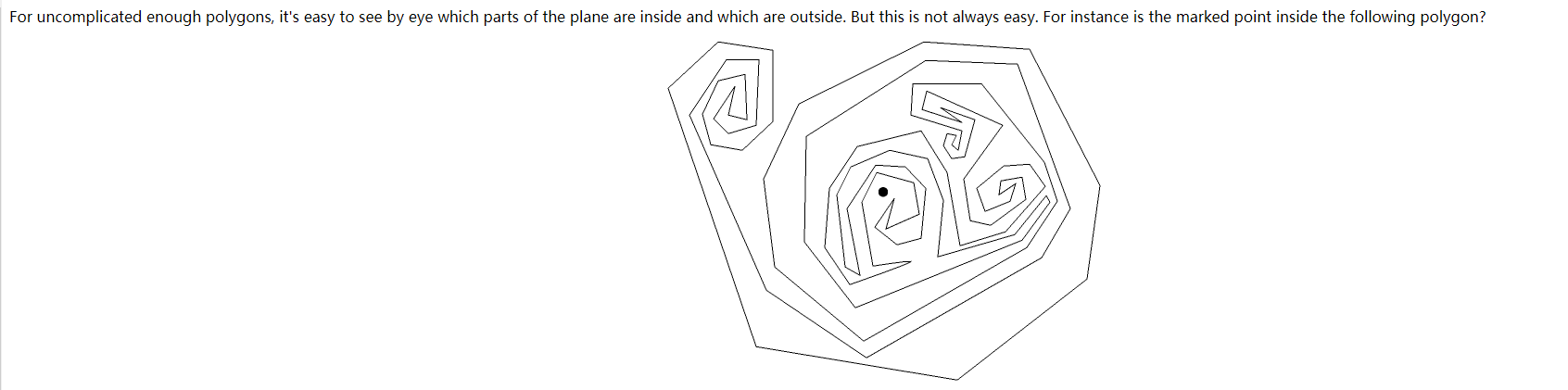
归并排序时间复杂度最好和最坏时间复杂度都是O(nlgn)

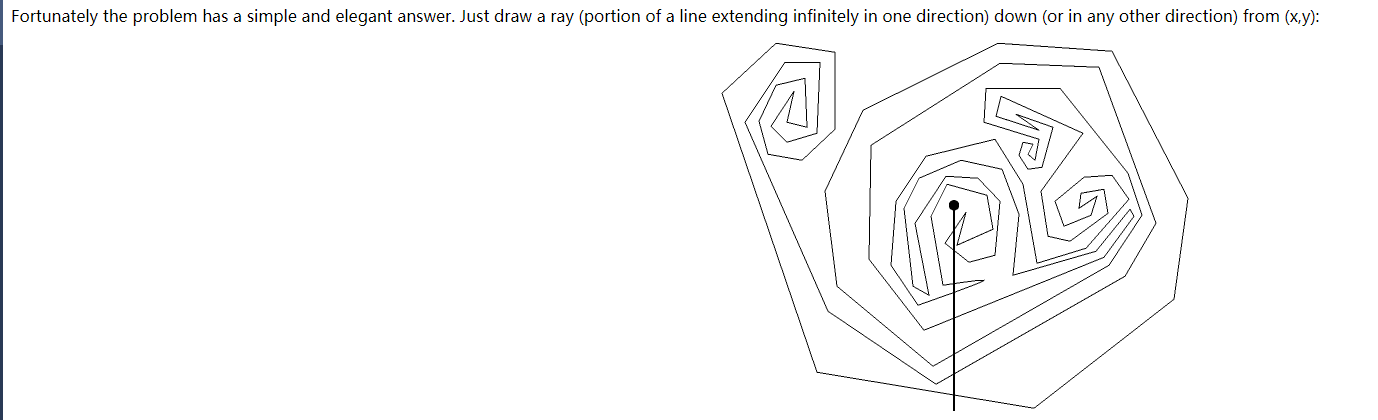
Ref:

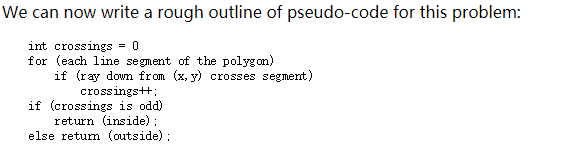
<https://www.cs.jhu.edu/~misha/Spring16/>

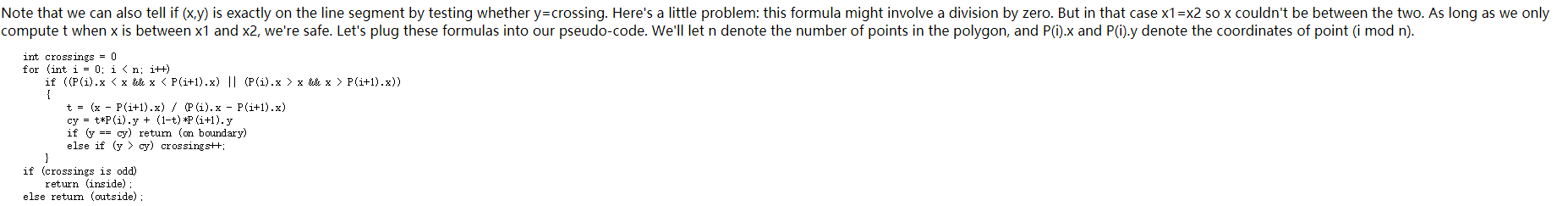
## 点与多边形的位置关系（Testing if a point is in a polygon）

Sometimes we use the phrase simple polygon to emphasize the requirement that no two segments cross.









Ref:

多边形定向

多边形凹凸性判定

多边形裁剪

Arrangement2d

平面多边形区域划分

Polygon Partitioning

三角剖分 Delaunay triangulation

桥

匹配性

图的可平面性

线段求交

<http://blog.csdn.net/chenhuajie123/article/details/9296359>

<https://www.ics.uci.edu/~eppstein/161/960307.html>

<https://www.cs.jhu.edu/~misha/Spring16/>

<http://www.industrial-geometry.at/events/strobl2006/cg_edu_aichholzer_a4.pdf>

<http://geomalgorithms.com/a03-_inclusion.html>

<https://stackoverflow.com/questions/217578/how-can-i-determine-whether-a-2d-point-is-within-a-polygon>

<https://fotino.me/calculating-centroids/>

<https://en.wikipedia.org/wiki/Centroid#Centroid_of_polygon>

<http://mathcentral.uregina.ca/qq/database/qq.09.07/h/david7.html>

<http://www.seas.upenn.edu/~sys502/extra_materials/Polygon%20Area%20and%20Centroid.pdf>

<https://math.stackexchange.com/questions/90463/how-can-i-calculate-the-centroid-of-polygon>

<https://stackoverflow.com/questions/2792443/finding-the-centroid-of-a-polygon>

<https://cstheory.stackexchange.com/questions/25340/a-continuous-center-point-of-a-convex-spherical-polygon>

<http://codeforces.com/blog/entry/48868>

<https://stackoverflow.com/questions/10052546/point-in-polygon-algorithm-in-programming-contests>

<https://ac.els-cdn.com/S0925772101000128/1-s2.0-S0925772101000128-main.pdf?_tid=abf40ad7-a068-44bc-8ef5-d9d46a841c7b&acdnat=1519978179_19f47819afe7c2b65a0207813ed3a3d9>

<https://www.google.co.jp/search?newwindow=1&ei=IwaZWvmGBsuC8gWN97PoBA&q=centroid+of+a+polygon&oq=centroid+of+a+polygon&gs_l=psy-ab.3..0i7i30k1l9j0.17572.20268.0.21876.13.13.0.0.0.0.129.1352.1j11.12.0....0...1.1.64.psy-ab..1.12.1351...0i7i10i30k1.0.B28NSer4rgA>

<https://www.edx.org/course/ji-suan-ji-he-computational-geometry-tsinghuax-70240183x>

<https://www.google.co.jp/search?newwindow=1&q=computational+geometry+tutorial&sa=X&ved=0ahUKEwj7oOmcx8zZAhVOhbwKHUNADaoQ1QIIpAEoBQ&biw=1745&bih=818>