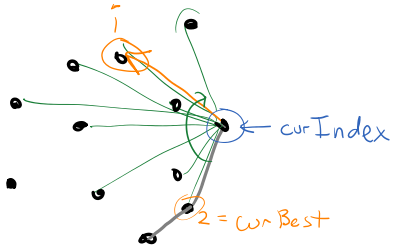
points: stored in a list
$[p_1, p_2, \ldots, p_n]$

LeftOf(a,b,c) returns True iff c is left of $\overrightarrow{ab}$



repeat this for each point in the hull

IMPLEMENTATION

Let curIndex be index of current point on the hull.

Let curBest be the index of some point
if curIndex = 1, then set curBest = 2
otherwise, curBest = 1

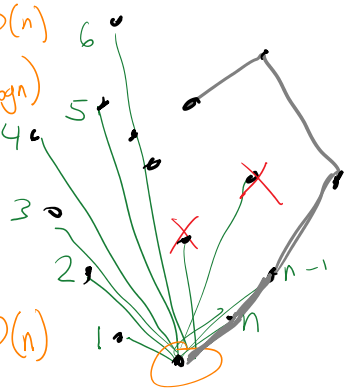
O(n)
For i from 2 to n:
If i==curBest or i==curIndex: continue
If LeftOf(pts[curIndex], pts[i], pts[curBest]):
set curBest = i

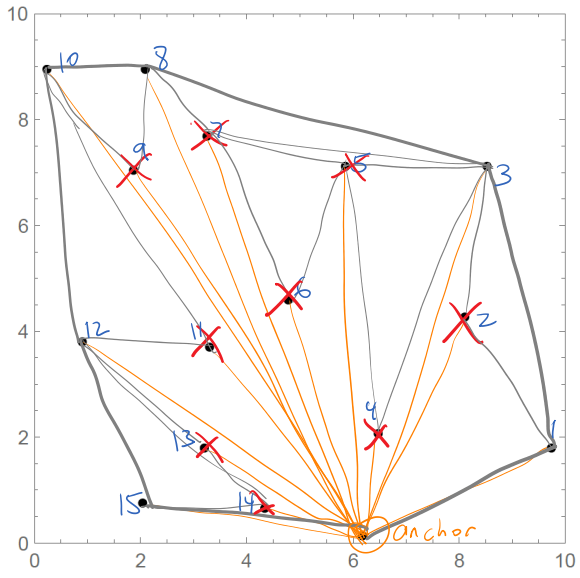
Let h be the number of points in the hull.
Then the gift-wrapping algorithm is $O(nh)$.

Worst case: $n=h$, so alg is $O(n^2)$.

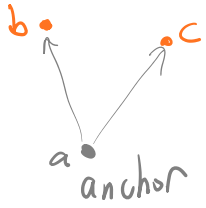
GRAHAM SCAN ALGORITHM – $O(n \log n)$

1. Choose the lowest point as an anchor — $O(n)$
2. Sort all the other points by their angle with the anchor — $O(n \log n)$
3. Construct the hull as follows: — $O(n)$
   - append next point to the hull
   - remove any reflex vertices that result





SORTING POINTS



is b left of $\overrightarrow{ac}$?

If yes, then c comes before b.

If no, then b comes before c.

Fact: Sorting n items can be done in $O(n \log n)$ time, but not faster.

optimal