Homework#12 Computational Geometry

Textbook:

18.12. Let p be a point external to a convex polygon P. Given $CH(P)$, explain how to compute in $O(\log n)$ time the convex hull of their union, i.e., the convex hull of $P \cup \{p\}$.

18.17. Given a set of n points in the plane, show how to construct a simple polygon having them as its vertices. The algorithm should run in time $O(n \log n)$.

Optional: On-line convex-hull problem. In on-line convex-hull problem, we are given the set Q of n points one point at a time. After receiving each point, we compute the convex hull of the points seen so far. Obviously, we could run Graham's scan once for each point, with a total running time of $O(n^2 log n)$. Show how to solve the on-line convex-hull problem in a total of $O(n^2)$ time.