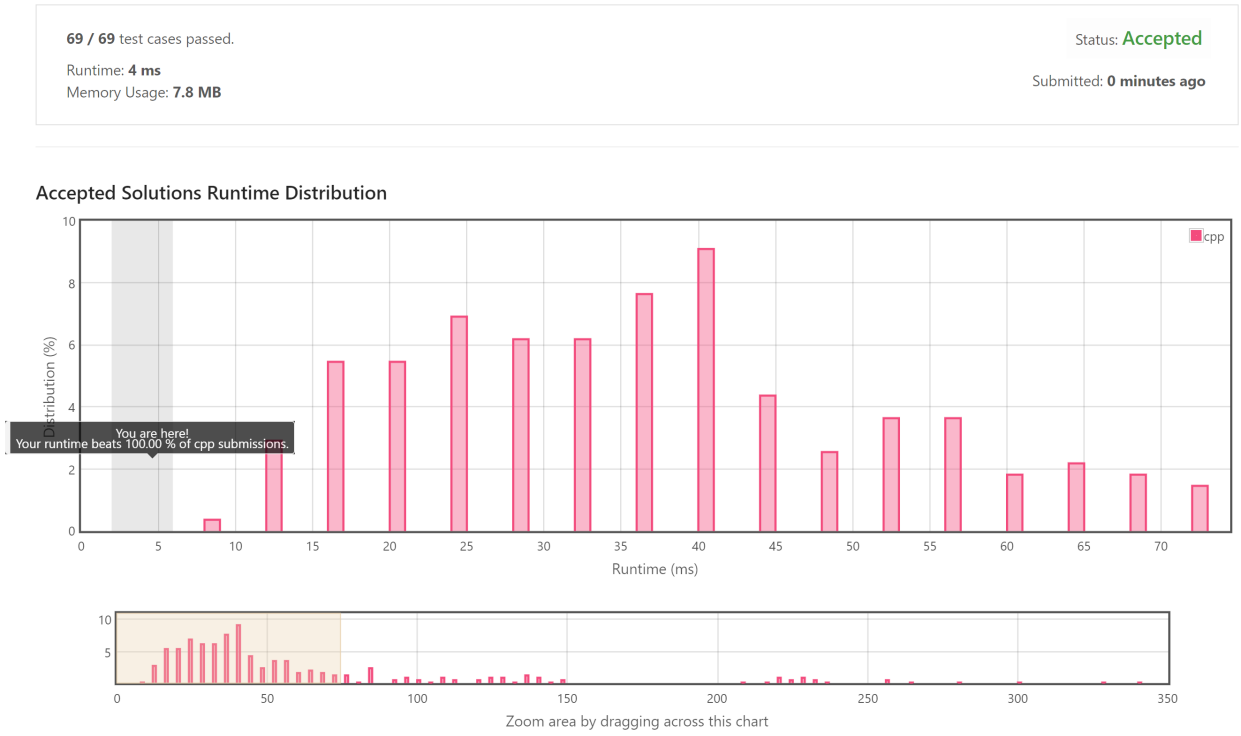
This is a variant of the 1D facility location problem (uniform k-median, continuous version).

1. DP. $O(n^2k)$.
2. The transition of DP has monotone property. Use divide and conquer. $O(nk \log n)$.
   https://leetcode-cn.com/problems/allocate-mailboxes/solution/dong-tai-gui-hua-shi-jian-fu-za-du-oknlognkong-jia/
3. $O(nk)$ by searching in a totally monotone matrix [1].
4. $O(n \log U)$ [1].
5. $O(\min\{nk, n\sqrt{k \log n} \log n, n2^{O(\sqrt{\log k \log\log n})} \log n\})$ [2].



References

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[2] Haitao Wang and Jingru Zhang. Line-constrained k-median, k-means, and k-center problems in the plane. *International Journal of Computational Geometry & Applications*, 26(3-4):185–210, 2016.