Week 2

Exercises

E02-01. Implement binary search and give some examples to test it.

Input: a sorted array A of n distinct integers and a integer x

Output: the index of x in array A

E02-02. Merge two sorted lists and give some examples to test it.

Input: two sorted list A and B.

Output: a sorted list which merge A and B.

E02-03. Implement the algorithms of target-sum with $O(n^2)$, $O(nlog(n))$, $O(n)$ respectively and give some examples to test it.

Input: a sorted array of n distinct integers, an integer T.

Output: two integers that sum to exactly T.

E02-04. Implement the algorithms of the shortest distance and give some examples to test it.

Input: a list of n points in the two-dimensional space $\{(x_1, y_1), \cdots, (x_n, y_n)\}$,

Output: the pair that is closest to each other.

E02-05. Implement the algorithms of 3-sum with $O(n^3)$ $O(nlog(n))$, $O(n^2)$respectively and give some examples to test it.

Input: a sorted array of n distinct integers, an integer T.

Output: three integers that sum to exactly T.