Lab Assignment

Data structure Lab

ODD 2022

Week 7 lab B

1. Given an array of n distinct integers sorted in ascending order, write a function that returns a Fixed Point in the array, if there is any Fixed Point present in array, else returns -1. Fixed Point in an array is an index i such that arr[i] is equal to i. Note that integers in array can be negative.

Examples:

Input: arr[] = {-10, -5, 0, 3, 7}

Output: 3 // arr[3] == 3

Input: arr[] = {0, 2, 5, 8, 17}

Output: 0 // arr[0] == 0

Input: arr[] = {-10, -5, 3, 4, 7, 9}

Output: -1 // No Fixed Point

1. Dilpreet wants to paint his dog's home that has n boards with different lengths. The length of ith board is given by arr[i] where arr[] is an array of n integers. He hired k painters for this work and each painter takes 1 unit time to paint 1 unit of the board.

The problem is to find the minimum time to get this job done if all painters start together with the constraint that any painter will only paint continuous boards, say boards numbered {2,3,4} or only board {1} or nothing but not boards {2,4,5}.

Example 1:

Input:

n = 5

k = 3

arr[] = {5,10,30,20,15}

Output: 35

Explanation: The most optimal way will be:

Painter 1 allocation : {5,10}

Painter 2 allocation : {30} Painter 3 allocation : {20,15}

Job will be done when all painters finish

i.e. at time = max(5+10, 30, 20+15) = 35

1. Given an array of size n and a range [a, b]. The task is to partition the array around the range such that array is divided into three parts.
   1. All elements smaller than a come first.
   2. All elements in range a to b come next.
   3. All elements greater than b appear in the end.

The individual elements of three sets can appear in any order. You are required to return the modified array.

Example 1: Input:

n = 5

A[] = {1, 2, 3, 3, 4}

[a, b] = [1, 2]

Output: 1

Explanation: One possible arrangement is:

{1, 2, 3, 3, 4}. If you return a valid arrangement, output will be 1.