

Assignment 11

Q1. Given an array of N integers arr[] where each element represents the max number of steps that can be made forward from that element.

Find the minimum number of jumps to reach the end of the array (starting from the first element).

If an element is 0, then you cannot move through that element.

Note: Return -1 if you can't reach the end of the array.

Example 1:

Input:

N = 11

arr[] = {1, 3, 5, 8, 9, 2, 6, 7, 6, 8, 9}

Output: 3

Explanation:

First jump from 1st element to 2nd element with value 3. Now, from here we jump to 5th element with value 9, and from here we will jump to last.

Example 2:

Input :

N = 6

arr = {1, 4, 3, 2, 6, 7}

Output: 2

Explanation:

First we jump from the 1st to 2nd element
and then jump to the last element.

Q2. Given an array of N integers, and an integer K,
find the number of pairs of elements in the array whose sum is equal to K.

Example 1:

Input:

$N = 4, K = 6$

$arr[] = \{1, 5, 7, 1\}$

Output: 2

Explanation:

$arr[0] + arr[1] = 1 + 5 = 6$

and $arr[1] + arr[3] = 5 + 1 = 6$.

Example 2:

Input:

$N = 4, X = 2$

$arr[] = \{1, 1, 1, 1\}$

Output: 6

Explanation:

Each 1 will produce sum 2 with any 1.

Q3. Given two arrays: $a1[0..n-1]$ of size n and $a2[0..m-1]$ of size m .

Task is to check whether $a2[]$ is a subset of $a1[]$ or not.

Both the arrays can be sorted or unsorted.

It may be assumed that elements in both array are distinct.

Example 1:

Input:

$a1[] = \{11, 1, 13, 21, 3, 7\}$

$a2[] = \{11, 3, 7, 1\}$

Output:

Yes

Explanation:

$a2[]$ is a subset of $a1[]$

Example 2:

Input:

$a1[] = \{1, 2, 3, 4, 5, 6\}$

$a2[] = \{1, 2, 4\}$

Output:

Yes

Explanation:

$a2[]$ is a subset of $a1[]$

Example 3:

Input:

$a1[] = \{10, 5, 2, 23, 19\}$

$a2[] = \{19, 5, 3\}$

Output:

No

Explanation:

$a2[]$ is not a subset of $a1[]$

Q4. Number Series with a Twist

Consider the series : 0,0,2,1,4,2,6,3,8,4,10,5,12,6,14,7,16,8

This series is a mixture of 2 series, all the odd terms in this series form even numbers in ascending order and every even terms is derived from the previous term using the formula $(x/2)$

Write a program to find the nth term in this series.

The value of n is a positive integer that should be read from STDIN and the nth term that is to be calculated by the program should be written to STDOUT.

Other than the value of the nth term, no other characters /strings or message should be written to STDOUT.

For example

If $n=10$, the 10th term in the series is to be derived from the 9th term in the series. The 9th term is 8 so the 10th term is $(8/2)=4$. Only the value 4 should be printed to STDOUT.

You can assume that the n will not exceed 20,000.