Task 11

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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.

In [3]:

```python
def jump(arr, l, h):
    if (h == l):
        return 0

    if (arr[l] == 0):
        return float('inf')

    min = float('inf')
    for i in range(l + 1, h + 1):
        if (i < l + arr[l] + 1):
            jumps = jump(arr, i, h)
            if (jumps != float('inf') and
                    jumps + 1 < min):
                min = jumps + 1

    return min
```

In [10]:

```python
arr = [21, 43, 85, 98, 19, 42, 86, 57, 16, 4, 95]
n = len(arr)
print("Minimum number of jumps to reach the end of an array is : => ", jump(arr, 0, n - 1
))
```

Minimum number of jumps to reach the end of an array is : => 1

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

In [16]:

```python
def num_of_pairs(arr, n, k):
    for i in range(0, n):
        for j in range(i + 1, n):
            if (arr[i] + arr[j] == k):
                print("(", arr[i], ", ", arr[j], ")")
```

In [18]:

```python
arr = [1, 5, 7, 1]
n = 4
k = 6
num_of_pairs(arr, n, k)
```

(1 , 5)
(5 , 1)

In [ ]:

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[]

In [7]:

```python
def subset(a1, a2, l1, l2):
    i = 0
    j = 0
    if l1 < l2:
        return 0

    a1.sort()
    a2.sort()

    while i < l1 and j < l2:
        if a1[j] < a2[i]:
            j += 1
        elif a1[j] == a2[i]:
            j += 1
            i += 1
        elif a1[j] > a2[i]:
            return 0
    else:
        return False if i < l2 else True
```

In [8]:

```python
a1 = [11, 1, 13, 21, 3, 7]
a2 = [11, 3, 7, 1]

l1 = len(a1)
l2 = len(a2)
if subset(a1, a2, l1, l2) == True:
    print("Yes")
else:
    print("No")
```

Yes

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.

In [9]:

```python
n = int(input('Enter the number: =>'))
a=0
b=0
for i in range(1,n+1):
    if(i%2!=0):
        a= a+2
    else:
        b= b+1
if(n%2!=0):
```

```
        print('{}'.format(a-2))
else:
    print('{}'.format(b-1))
```

Enter the number: =>12
5

In [ ]: