

AVAILABLE LESSONS:

Lesson 1
Iterations

Lesson 2
Arrays

Lesson 3
Time Complexity

Lesson 4
Counting Elements

Lesson 5
Prefix Sums

Lesson 6
Sorting

Lesson 7
Stacks and Queues

Lesson 8
Leader

Lesson 9
Maximum slice problem

Lesson 10
Prime and composite numbers

Lesson 11
Sieve of Eratosthenes

Lesson 12
Euclidean algorithm

Lesson 13
Fibonacci numbers

Lesson 14
Binary search algorithm

PAINLESS

TieRopes

START

Tie adjacent ropes to achieve the maximum number of ropes of length $\geq K$.

Programming language: C++ ▼

There are N ropes numbered from 0 to $N - 1$, whose lengths are given in a zero-indexed array A , lying on the floor in a line. For each I ($0 \leq I < N$), the length of rope I on the line is $A[I]$.

We say that two ropes I and $I + 1$ are *adjacent*. Two adjacent ropes can be tied together with a knot, and the length of the tied rope is the sum of lengths of both ropes. The resulting new rope can then be tied again.

For a given integer K , the goal is to tie the ropes in such a way that the number of ropes whose length is greater than or equal to K is maximal.

For example, consider $K = 4$ and array A such that:

```
A[0] = 1
A[1] = 2
A[2] = 3
A[3] = 4
A[4] = 1
A[5] = 1
A[6] = 3
```

The ropes are shown in the figure below.



We can tie:

- rope 1 with rope 2 to produce a rope of length $A[1] + A[2] = 5$;
- rope 4 with rope 5 with rope 6 to produce a rope of length $A[4] + A[5] + A[6] = 5$.

After that, there will be three ropes whose lengths are greater than or equal to $K = 4$. It is not possible to produce four such ropes.

Write a function:

```
int solution(int K, vector<int> &A);
```

that, given an integer K and a non-empty zero-indexed array A of N integers, returns the maximum number of ropes of length greater than or equal to K that can be created.

For example, given $K = 4$ and array A such that:

```
A[0] = 1
A[1] = 2
A[2] = 3
A[3] = 4
```

Lesson 15

Caterpillar method

*Lesson 16***Greedy algorithms***Lesson 17*

Dynamic programming

Lesson 90

Tasks from Indeed Prime 2015 challenge

Lesson 91

Tasks from Indeed Prime 2016 challenge

Lesson 92

Tasks from Indeed Prime 2016 College Coders challenge

Lesson 99

Future training

 $A[4] = 1$ $A[5] = 1$ $A[6] = 3$

the function should return 3, as explained above.

Assume that:

- N is an integer within the range [1..100,000];
- K is an integer within the range [1..1,000,000,000];
- each element of array A is an integer within the range [1..1,000,000,000].

Complexity:

- expected worst-case time complexity is $O(N)$;
- expected worst-case space complexity is $O(N)$, beyond input storage (not counting the storage required for input arguments).

Elements of input arrays can be modified.

Copyright 2009–2016 by Codility Limited. All Rights Reserved. Unauthorized copying, publication or disclosure prohibited.

For programmers

Lessons Challenges
Terms FAQ

For companies

Tour About us
Pricing Jobs
Blog Terms
Privacy Cookies
API

Sign up for our newsletter:

Information about upcoming challenges, solutions and lessons directly in your inbox.

Your email

Sign up

Social:

f t in

Contact us:

For customer support queries:
UK +44 (0) 208 970 78 68
US 1-415-466-8085
support@codility.com

For sales queries:
UK +44 (0) 208 970 78 67
US 1-415-466-8085
sales@codility.com