Boats to Save People

Try to solve the Boats to Save People challenge.

Statement

A big ship with numerous passengers is sinking, and there is a need to evacuate these people with the minimum number of life-saving boats. Each boat can carry, at most, two persons however, the weight of the people cannot exceed the carrying weight limit of the boat.

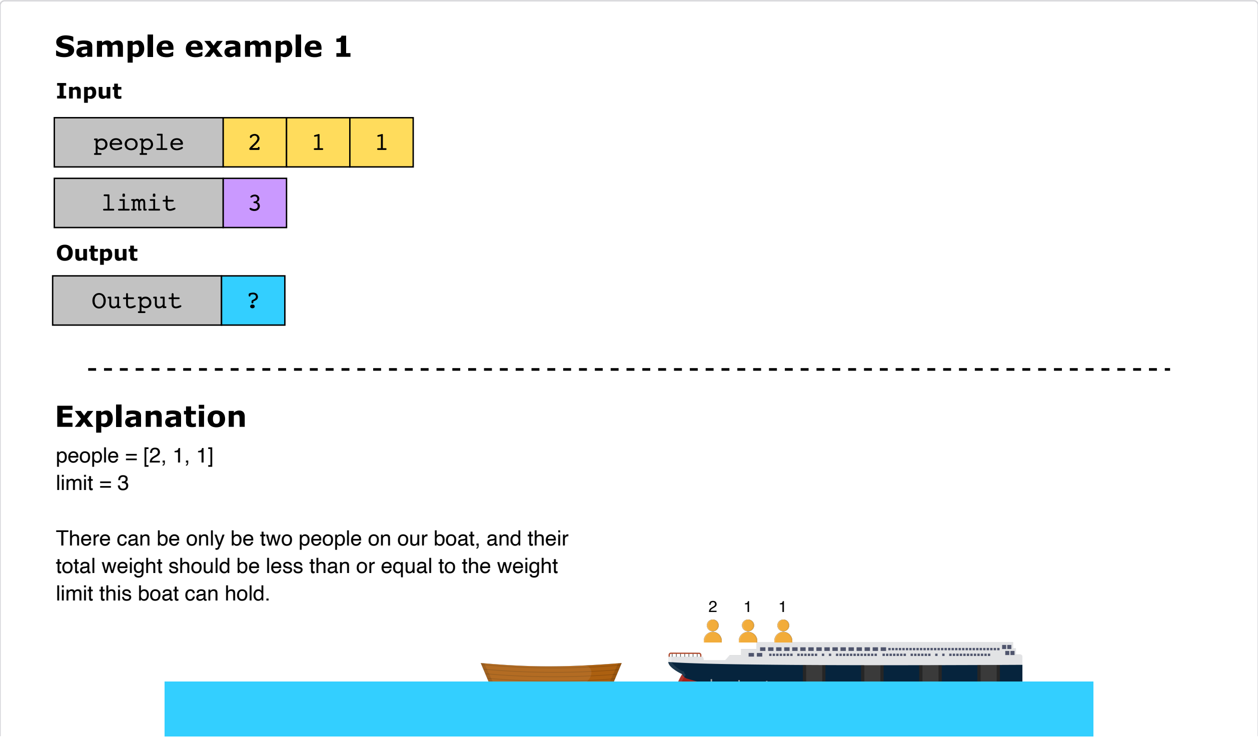
We are given an array, `people`, where `people[i]` is the weight of the i^{th} person, and an infinite number of boats, where each boat can carry a maximum weight, `limit`. Each boat carries, at most, two people at the same time. This is provided that the sum of the weight of these people is under or equal to the weight limit.

You need to return the minimum number of boats to carry all persons in the array.

Constraints:

- $1 \leq$ `people.length` $\leq 5 \times 10^3$
- $1 \leq$ `people[i]` $\leq$ `limit` $\leq 3 \times 10^3$

Examples



Sample example 1

Input

people	2	1	1

limit	3

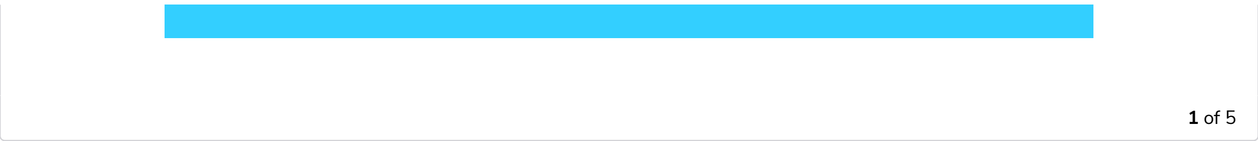
Output

Output	?

Explanation

people = [2, 1, 1]
limit = 3

There can be only be two people on our boat, and their total weight should be less than or equal to the weight limit this boat can hold.



Understand the problem

Let’s take a moment to make sure you've correctly understood the problem. The quiz below helps you check if you're solving the correct problem:

Boats To Save People

1 How many boats are required to save everyone if we have the following inputs?

people = [3, 2, 2, 1, 1]

limit = 3

A) 4

B) 3

C) 5

D) 2

Submit Answer

Question 1 of 2
0 attempted

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Figure it out

We have a game for you to play. Rearrange the logical building blocks to develop a clearer understanding of how to solve this problem.

Drag and drop the cards to rearrange them in the correct order.

Sort the `people` array so that the lightest person is at the start of the array and the heaviest person is at the end of the array.

Initialize two pointers— `left` at the start and `right` at the end of the array.

Iterate over the `people` array and check if the combined weight of the lightest and heaviest person is under the weight limit. If it is, then increment the `left` pointer and decrement the `right` pointer.

Otherwise, rescue the heaviest person alone and decrement the `right` pointer.

Increment the number of boats.

Return the number of boats.

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Try it yourself

Implement your solution in `RescueBoats.java` in the following coding playground. We have provided a useful code template in the other file that you may build on to solve this problem.

Java

RescueBoats.java

TwoPointers.java

```java

public class RescueBoats{
    public static int rescueBoats(int[] people, int limit) {

        // Replace the placeholder return statement below with your code

        return -1;
    }
}
```

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Test Cases Results

Case 1 Case 2 Case 3

Input #1

```
[3,1,4,2,4]
```

Input #2

```
4
```

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Solution: Boats to Sav...

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