LEAST CAPACITY TO SHIP PACKAGES WITHIN D DAYS

☆ We are given an array of integers where each element represents weights of each element which is to be transported. Our goal is to find the least capacity of a ship which can be used to transport the weights in under D trips.

Obviously, minimum capacity is the largest number in the entire array because otherwise ship will not be able to carry. We can complete entire thing in 1 day if our ship has capacity of the full array.

Brute force solution is to take a linear search from this min to max and find the smallest capacity. Optimal solution is to use Binary Search for the same

Pseudocode :

```
daysCalculator(arr, N, c) {
    days = 0
    cap = 0
    for(i = 0 → N - 1) {
        if(cap + arr[i] > c) {
            days += 1
```

```
            cap = arr[i]
        } else {
            cap += arr[i]
        }
    }
    return days
}
capacityUnderD(arr, N, D) {
    min, max = 0, 0
    for(i = 0 → N) {
        max += arr[i]
        if (min < arr[i]) {
            min = arr[i]
        }
    }
    ans = -1
    while(min <= max) {
        mid = (min + max) | 2
        days = daysCalculator(arr, N, mid)
        if(days <= t) {
            ans = days
            max = mid - 1
        } else {
            min = mid + 1
        }
    }
    return ans
}
```