Problem 948: Bag of Tokens

Problem Information

Difficulty: Medium
Acceptance Rate: 59.38%
Paid Only: No
Tags: Array, Two Pointers, Greedy, Sorting

Problem Description

You start with an initial **power** of `power`, an initial **score** of `0`, and a bag of tokens given as an integer array `tokens`, where each `tokens[i]` denotes the value of token _i_.

Your goal is to **maximize** the total **score** by strategically playing these tokens. In one move, you can play an **unplayed** token in one of the two ways (but not both for the same token):

* **Face-up** : If your current power is **at least** `tokens[i]`, you may play token _i_ , losing `tokens[i]` power and gaining `1` score. * **Face-down** : If your current score is **at least** `1`, you may play token _i_ , gaining `tokens[i]` power and losing `1` score.

Return _the**maximum** possible score you can achieve after playing **any** number of tokens_.

Example 1:

Input: tokens = [100], power = 50

Output: 0

Explanation**:** Since your score is `0` initially, you cannot play the token face-down. You also cannot play it face-up since your power (`50`) is less than `tokens[0]` (`100`).

Example 2:

Input: tokens = [200,100], power = 150

Output: 1

Explanation: Play token _1_ (`100`) face-up, reducing your power to `50` and increasing your score to `1`.

There is no need to play token _0_ , since you cannot play it face-up to add to your score. The maximum score achievable is `1`.

Example 3:

Input: tokens = [100,200,300,400], power = 200

Output: 2

Explanation: Play the tokens in this order to get a score of `2`:

1. Play token _0_ (`100`) face-up, reducing power to `100` and increasing score to `1`. 2. Play token _3_ (`400`) face-down, increasing power to `500` and reducing score to `0`. 3. Play token _1_ (`200`) face-up, reducing power to `300` and increasing score to `1`. 4. Play token _2_ (`300`) face-up, reducing power to `0` and increasing score to `2`.

The maximum score achievable is `2`.

Constraints:

* `0 <= tokens.length <= 1000` * `0 <= tokens[i], power < 104`

Code Snippets

C++:

```
class Solution {
public:
int bagOfTokensScore(vector<int>& tokens, int power) {

}
};
```

Java:

```
class Solution {
public int bagOfTokensScore(int[] tokens, int power) {

}
}
```

Python3:

```
class Solution:
def bagOfTokensScore(self, tokens: List[int], power: int) -> int:
```