Fruits into Baskets (medium)

We'll cover the following

Problem Statement

Given an array of characters where each character represents a fruit tree, you are given **two baskets**, and your goal is to put **maximum number of fruits in each basket**. The only restriction is that **each basket can have only one type of fruit**.

You can start with any tree, but you can't skip a tree once you have started. You will pick one fruit from each tree until you cannot, i.e., you will stop when you have to pick from a third fruit type.

Write a function to return the maximum number of fruits in both the baskets.

Example 1:

```
Input: Fruit=['A', 'B', 'C', 'A', 'C']
Output: 3
Explanation: We can put 2 'C' in one basket and one 'A' in the oth
er from the subarray ['C', 'A', 'C']
```

Example 2:

```
Input: Fruit=['A', 'B', 'C', 'B', 'B', 'C']
Output: 5
Explanation: We can put 3 'B' in one basket and two 'C' in the oth
er basket.
This can be done if we start with the second letter: ['B', 'C',
'B', 'B', 'C']
```

Try it yourself

Try solving this question here:

Java | Python3 | JS | C++

```python
def fruits_into_baskets(fruits):
  # TODO: Write your code here
  d,start = {},0
  ans = 0
  for i in range(len(fruits)):
    # extend windows
    r_fruit = fruits[i]
    if r_fruit not in d:
      d[r_fruit] = 1
    else:
      d[r_fruit] += 1

    # shrink
    while len(d)>2:
      l_fruit = fruits[start]
      d[l_fruit] -= 1
      if d[l_fruit]==0:
        del d[l_fruit]
      start +=1
    ans = max(ans,i-start+1)
  return ans
```

```
22
```

Show Results | Show Console

2 of 2 Tests Passed

Result	Input	Expected Output	Actual Output	Reason
✓	fruits_into_baskets([A, B, C, A, C])	3	3	Succeeded
✓	fruits_into_baskets([A, B, C, B, B, C])	5	5	Succeeded

0.15s

Solution

This problem follows the **Sliding Window** pattern and is quite similar to Longest Substring with K Distinct Characters (https://www.educative.io/collection/page/5668639101419520/5671464854355968/5698217712812032/). In this problem, we need to find the length of the longest subarray with no more than two distinct characters (or fruit types!). This transforms the current problem into **Longest Substring with K Distinct Characters** where K=2.

Code

Here is what our algorithm will look like, only the highlighted lines are different from Longest Substring with K Distinct Characters (https://www.educative.io/collection/page/5668639101419520/5671464854355

968/5698217712812032/):

Java Python3 C++ JS

```
def fruits_into_baskets(fruits):
  window_start = 0
  max_length = 0
  fruit_frequency = {}

  # try to extend the range [window_start, windc
  for window_end in range(len(fruits)):
    right_fruit = fruits[window_end]
    if right_fruit not in fruit_frequency:
      fruit_frequency[right_fruit] = 0
    fruit_frequency[right_fruit] += 1

    # shrink the sliding window, until we are le
    while len(fruit_frequency) > 2:
      left_fruit = fruits[window_start]
      fruit_frequency[left_fruit] -= 1
      if fruit_frequency[left_fruit] == 0:
        del fruit_frequency[left_fruit]
      window_start += 1  # shrink the window
    max_length = max(max_length, window_end-winc
  return max_length


def main():
  print("Maximum number of fruits: " + str(fruit
  print("Maximum number of fruits: " + str(fruit

```

Time Complexity

The above algorithm's time complexity will be $O(N)$, where 'N' is the number of characters in the input array. The outer `for` loop runs for all characters, and the inner `while` loop processes each character only once;

therefore, the time complexity of the algorithm will be $O(N + N)$, which is asymptotically equivalent to $O(N)$.

Space Complexity

The algorithm runs in constant space $O(1)$ as there can be a maximum of three types of fruits stored in the frequency map.

Similar Problems

Problem 1: Longest Substring with at most 2 distinct characters

Given a string, find the length of the longest substring in it with at most two distinct characters.

Solution: This problem is exactly similar to our parent problem.

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Longest Substring with K Distinct Cha...

Next

No-repeat Substring (hard)

Completed

Report an Issue

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