760. Find Anagram Mappings (/problems/find-anagram-mappings/)

Jan. 6, 2018 | 21.3K views

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Given two lists `A` and `B`, and `B` is an anagram of `A`. `B` is an anagram of `A` means `B` is made by randomizing the order of the elements in `A`.

We want to find an *index mapping* `P`, from `A` to `B`. A mapping `P[i] = j` means the `i`th element in `A` appears in `B` at index `j`.

These lists `A` and `B` may contain duplicates. If there are multiple answers, output any of them.

For example, given

```
A = [12, 28, 46, 32, 50]
B = [50, 12, 32, 46, 28]
```

We should return

```
[1, 4, 3, 2, 0]
```

as `P[0] = 1` because the `0`th element of `A` appears at `B[1]`, and `P[1] = 4` because the `1`st element of `A` appears at `B[4]`, and so on.

Note:

1. `A, B` have equal lengths in range `[1, 100]`.
2. `A[i], B[i]` are integers in range `[0, 10^5]`.

Approach #1: Hash Table [Accepted]

Intuition

Take the example `A = [12, 28, 46]`, `B = [46, 12, 28]`. We want to know where the `12` occurs in `B`, say at position `1`; then where the `28` occurs in `B`, which is position `2`; then where the `46` occurs in `B`, which is position `0`.

If we had a dictionary (hash table) `D = {46: 0, 12: 1, 28: 2}`, then this question could be handled easily.

Algorithm

Create the hash table `D` as described above. Then, the answer is a list of `D[A[i]]` for `i = 0, 1, ...`.

Java | Python

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```
class Solution(object):
    def anagramMappings(self, A, B):
        D = {x: i for i, x in enumerate(B)}
        return [D[x] for x in A]
```

Complexity Analysis

- Time Complexity: $O(N)$, where N is the length of A.
- Space Complexity: $O(N)$.

Analysis written by: @awice (https://leetcode.com/awice).

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(/narendrakoli4666)

narendrakoli4666 (narendrakoli4666) ★ 19 January 7, 2019 9:07 AM

I think this approach won't work for duplicates.
If both array contains duplicates values then this approach will fail.

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HIDE 3 REPLIES

(/beastcode)

BEastCode (beastcode) ★ 1 May 4, 2019 10:34 AM

@bertbag (https://leetcode.com/bertbag) Just want to point out that you can use Map.getOrDefault instead of an if/else statement to get some cleaner looking code.

You could replace

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(/ikelber)

ikelber (ikelber) ★ 30 January 8, 2019 3:22 PM

This solution is actually correct because there is no requirement for the indice mappings to be distinct. So every occurrence of an element e can map to the same index in B .

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(/bertbag)

bertbag (bertbag) ★ 10 January 8, 2019 6:31 AM

You are correct.

I did:

class Solution {

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(/chung_eun)

chung_eun (chung_eun) ★ 10 February 16, 2018 1:02 AM

The solution may not work if A has duplicate items.

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(/jiafang)

jiafang (jiafang) ★ 11 February 10, 2018 11:42 PM

These lists A and B may contain duplicates. If there are multiple answers, output any of them.

This description is confusing, or rather wrong.
Depending on the test case:
[20,20]

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(/javaman87)

javaman87 (javaman87) ★ 22 September 20, 2018 6:47 PM

I'm not sure why so many people are trying to handle the duplicates when the question states that " If there are multiple answers, output any of them" meaning it doesn't matter which value you return so it's not necessary to remove the value from any map or list you put it in.

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(/bhaumik10)

bhaumik10 (bhaumik10) ★ 1 September 2, 2018 1:56 AM

Alternate solution, to my surprise was accepted and beats 100% of the java solutions.
Time Complexity: O(N^2), where N is the length of A.
Space Complexity: O(N).

```
class Solution {
```

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(/rileymckenna)

rileymckenna (rileymckenna) ★ 3 April 18, 2018 12:16 PM

public class Solution {
public int[] AnagramMappings(int[] A, int[] B) {
int[] p = new int[A.Length];
for (int i = 0; i < A.Length; i++)
{

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(/guixl)

guixl (guixl) ★ 1 April 4, 2018 7:54 PM

Handle duplicates:
public int[] anagramMappings(int[] A, int[] B) {
Map<Integer, Queue> map = new HashMap<>();
for (int i=0; i<B.length; i++) {
int b = B[i];

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(/skandab)

SkandaB (skandab) ★ 85 February 6, 2018 8:29 AM

This solution will print duplicate values in P.
The question is vague, doesn't specify if we can omit indexes where an element is duplicate and consider any of the indexes where the element appears.

Tried to explain in depth in my post

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(/restart365)

restart365 (restart365) ★ 1 January 28, 2018 3:31 PM

Anyone have a solution in C? Have problem in malloc

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(/maggie222)

maggie222 (maggie222) ★ 2 August 30, 2018 1:59 AM

handle duplicates:
Time Complexity: O(N), where NN is the length of A.
Space Complexity: O(N).

```
public int[] anagramMappings(int[] A, int[] B) {
```

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