

HASHMAP-3

Assignment Questions



Assignment Questions

Q1. Given a map m, which is passed a parameter to the following functions. Write line(s) of code to complete the following functions:

a) Add the pair to the map m, where k represents key and v represents value.

```
void add_to_map(map<int,int> &m, int k, int v)
{
    // Write your code here
}
```

b) Return the value of the key k if it is present in the map m otherwise, return -1.

```
int find_in_map(map<int,int> &m, int k)
{
    // Write your code here
}
```

c) Print the map m i.e. key and value.

```
void print_map(map<int,int> &m)
{
    // Write your code here
}
```

Q2. Least frequent character

Given a string s. Print the character that is appearing least number of times. If more than one character is appearing least number of times, print the one appearing first in the string.

Example 1:

Input: s = "AAABBcccDDa"

Output: a

Explanation: The count of each character:

A - 3, B - 2, c - 3, D - 2, a - 1

Clearly a is least frequent character. Note that A is different from a.

Example 2:

Input: s = "xxxAyyyBzzzC"

Output: A

Explanation: The count of each character:

x - 3, A - 1, y - 3, B - 1, z - 4, C - 1

Clearly A, B, C are the least frequent characters. But A is appearing first in the string hence we will print that.

Q3. What will be the output of the following code:

```
map<int, int>m = {{1,1}, {2,4}, {3,9}, {4,16}, {5,25}};
m.insert_or_assign(6, 36);
m.insert({6, 36});

m.erase(++m.find(2), m.find(5));

for(auto i : m)
    cout<<i.first<<" - "<<i.second<<endl;
```

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Choose the correct option:

a) Compilation error

b) 1 - 1

2 - 4

5 - 25

6 - 36

c) Syntax error

d) 1 - 1

2 - 4

6 - 36

Q4. What will be the output of the following code:

```
map<int, int>m = {{1,1}, {2,4}, {3,9}, {4,16}, {5,25}};
```

```
map<int, int>::reverse_iterator it;
for(it = --m.rend(); it != m.rbegin(); it--)
    cout<<it->first<<" "<<it->second<<endl;
```

Choose the correct option:

a) 5 25

4 16

3 9

2 4

11

b) 4 16

3 9

2 4

11

c) 5 25

4 16

3 9

2 4

d) 11

2 4

3 9

4 16

Q5. Target Sum of 2 elements

Given an integer n representing the number of elements. Then n elements are given. An integer t is given which represents the target. You are required to print the indices of two numbers such that they add up to target t .

You cannot use a single element twice, i.e. the two indices can't be the same.

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You can return the answer in any order.

Example 1:

Input:

n = 7

Elements = [1, 4, 5, 11, 13, 10, 2]

Target = 13

Output: [3, 6]

Explanation: Because $a[3] + a[6] = 11 + 2 = 13$

Example 2:

Input:

n = 5

Elements = [9, 10, 2, 3, 5]

Target = 15

Output: [1, 4]

Explanation: Because $a[1] + a[4] = 10 + 5 = 15$

Q6. Find the majority element in the array. A majority element in an array $A[]$ of size n is an element that appears more than $n/2$ times. If there is no such element, return -1.

Input1:

n = 9

A[] = {3, 3, 4, 2, 4, 4, 2, 4, 4}

Output1:

4

Input2:

n = 8

A[] = {3, 3, 4, 2, 4, 4, 2, 4}

Output2:

-1

Q7. Given two arrays, of equal length n , the task is to find if the given arrays are equal or not. (Easy)

Return true if they are equal.

Two arrays are said to be equal if:

- both of them contain the same set of elements,
- arrangements (or permutations) of elements might/might not be the same.
- If there are repetitions, then counts of repeated elements must also be the same for two arrays to be equal.

Input1:

n = 5

arr1[] = {1, 2, 5, 4, 0}

arr2[] = {2, 4, 5, 0, 1}

Output1:

Yes

Input2:

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n = 3
arr1[] = {1, 7, 1}
arr2[] = {7, 7, 1}
Output2:
No

Q8. Given an array of pairs(2D array), find all symmetric pairs in it. Two pairs (a, b) and (c, d) are said to be symmetric if b and c are equal, and a is equal to d. It may be assumed that the first elements of all pairs are distinct. If no pair is present, print nothing. (Easy)

Input1:
n = 5
arr[][] = {{11, 20}, {30, 40}, {5, 10}, {40, 30}, {10, 5}}
Output1:
30 40
5 10

Input2:
n = 3
arr[] = {{11, 20}, {30, 40}, {10, 5}}
Output2:
0

Q9. Given two arrays A[] and B[] consisting of n and m elements respectively. Find the minimum number of elements to remove from each array such that no common elements exist in both. (Medium)

Input1:
n = 4
A[] = { 1, 2, 3, 4 }
m = 5
B[] = { 2, 3, 4, 5, 8 }
Output1:
3

Input2:
n = 4
A[] = { 1, 2, 3, 4 }
m = 3
B[] = { 5, 6, 7 }
Output2:
0

Q10. Consider a registration system. Each time a new user wants to register, he sends to the system a request with his name. If such a name does not exist in the system database, it is inserted into the database, and the user gets the response OK, confirming the successful registration. If the name already exists in the system database, the system makes up a new user name, sends it to the user as a prompt, and also inserts the prompt into the database. The new name is formed by the following rule. Numbers, starting with 1, are appended one after another to name (name1, name2, ...), among these numbers the least i is found so that name does not yet exist in the database.

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Given n names, you need to register these names in the database according to the rules and print the prompt for every registration.

Input1:

```
6
alice
bob
alice
alice
alice
bob
```

Output1:

```
OK
OK
alice1
alice2
alice3
bob1
```

Input2:

```
8
first
first
third
second
third
second
third
third
```

Output2:

```
OK
first1
OK
OK
third1
second1
third2
third3
```

Q11. You are given an array of n elements. You have to make subsets from the array such that no subset contains duplicate elements. Find out the minimum number of subsets possible.

(Easy)

Input1:

```
n = 4
arr[] = {1, 2, 3, 4}
```

Output1:

```
1
```

```
n = 6
arr[] = {1, 2, 3, 3, 2, 2}
```

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Output2:

3

Q12. Given an array of size N and an integer K, return the count of distinct numbers in all windows of size K. (Medium)

Input1:

n = 7
arr[] = {1, 2, 1, 3, 4, 2, 3}
k = 4

Output1:

3 4 4 3

Input2:

n = 4
arr[] = {1, 2, 4, 4}
k = 2

Output2:

2 2 1

Q13. Given a string s, find the length of the longest substring without repeating characters.

(Medium)

Input1:

s = "abcabcb"

Output1:

3

Input2:

s = "bbbbb"

Output2:

1

Q14. Given a string s consisting only of characters a, b and c, print the number of substrings containing at least one occurrence of all these characters a, b and c.

(Medium)

Input1:

s = "abcabc"

Output1:

10

Explanation:

The substrings containing at least one occurrence of the characters a, b and c are "abc", "abca", "abcab", "abcabc", "bca", "bcab", "bcabc", "cab", "cabc" and "abc" (again).

Input2:

s = "abc"

Output2:

1

Q15. Given an unsorted array of integers, find a subarray that adds to a given number. If there is more than one subarray with the sum of the given number, print any of them.

(Medium)

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Input1:

$n = 6$
 $\text{arr}[] = \{1, 4, 20, 3, 10, 5\}$

$\text{sum} = 33$

Output1:

Sum found between indexes 2 and 4

Explanation: Sum of elements between indices 2 and 4 is $20 + 3 + 10 = 33$

Input2:

$n = 5$
 $\text{arr}[] = \{10, 2, -2, -20, 10\}$

$\text{sum} = -10$

Output2:

Sum found between indexes 0 and 3