

BQ:

Describe a hack that you were particularly proud of, ashamed of, or both

What was one difficult problem you faced and how did you overcome it?

Is it better to be perfect and late, or good and on time?

What's a difficult challenge you've faced in a recent project?

Was there any situation when you just gave up on something?

Tell me about a time you were behind on a deadline?

What technologies have you incorporated within a team?

How would you handle having a proposal for a design or new technology rejected?

Tell me about a project that you are proud of. (be prepared to do some whiteboarding with them to talk about tech designs)

Tell me about a project (or a time) that you failed

Tell me about yourself.

What do you do if your project is behind schedule?

Have you ever worked with/mentored/coached under-performer and what did you do?

what would you do differently?

How do you work with coworkers that are difficult to deal with?

Why do you want to make a move? Why hubspot?

What is the biggest challenge the team has faced in the past year?

Algorithm:

1. *Given a string s, and a number n, return the most common n-gram in s*
2. *Sum of pairs with a target sum*
 - Write a function that, given a list of numbers and a target number N, returns a list of pairs of numbers that sum to the target.
 - Write a function that given an array and target number N as input, returns an array of pairs of numbers that Sum to N
3. *Merging two sorted arrays*
 - a. Simple question about sorting number arrays. Follow-up about efficiency and alternative solutions.
 - b. Write a function that, given two sorted lists of numbers and a target value V, returns a sorted merged list with at most V elements.
4. *Given an array of strings with only lowercase letters , create a function that returns an array of those same strings, but each string has its letters rearranged such that it becomes a palindrome (if possible, if not, return -1).*
5. *字符串每三个字符输出一下 例如 : abcd 输出abc bcd*

SQL Schema:

System design question about a social media application. Follow-up questions about potential database choices and choosing appropriate data structures.

SQL questions regarding a social-network feed

1. Was very rusty with SQL unfortunately, so things like pagination on MySQL I didn't remember at all.
2. Design a database model for a social network with people who write posts and can have friends. Write a query to extract the latest posts from your friends.

Background: Let's pretend we're working together to design a simple social network for HubSpot. Think of it like a very simple version of the Facebook "News Feed" where the logged in user sees the most recent posts from their friends. There are only text posts, and nothing fancy like machine learning ranking or even "Likes".

We'll work together to first design the schema for the database tables, and then query those tables to populate our "news feed". For now don't worry about scaling; let's keep it as simple as possible.

Example:

Alice is friends with **Bob** and **Charlie**. Of course there are other users she is not friends with.

When **Alice** logs in and views the webpage with her "news feed" it might look something like this, with most recent posts at the top.

11:30am - Bob writes: "I'm hungry for lunch"

9:30am - Charlie writes: "I also like coffee."

9:00am - Charlie writes: "I like waffles for breakfast"

...

<continued>

...

1.tblUser

ID: bigint Identity PK -> INDEX

Name: varchar(75)

Email: varchar(75)

createDate: Timestamp -> datetimeoffset(7)

2.tblJoinUserFriends

ID: Identity PK

From_User_ID: bigint -> Index FK

To_User_ID: bigint -> index FK

createDate: Timestamp -> datetimeoffset(7)

3.tblNewsFeed

FeedID: GUID PK -> index

UserID: bigint, FK -> index

Message: text

Date: datetimeoffset(7) -> index

Date_UserID

Alice userId = 1

Bob = 2

Charlie = 3

```
SELECT TOP 2 nf.Date,us.Name,nf.Message
FROM tblNewsFeed nf WITH(NOLOCK)
INNER JOIN tblJoinUserFriends uf WITH(NOLOCK) ON uf.To_User_ID =
nf.UserID
INNER JOIN tblUser us WITH(NOLOCK) ON uf.To_User_ID = us.ID
WHERE uf.From_User_ID = 1 AND (Date < '03/19 10:42')
OR(Date = '03/19 10:42' AND UserID < 3)
ORDER BY nf.Date, nf.UserID
DESC
```

FeedID: 4 and 5

FeedID: 1 and 2

tblNewsFeed

FeedID	UserID	Message	Date
4	2	ABC	03/19 10:42
1	2	EFG	03/19 10:40
3	3	abc	03/19 10:42
2	3	efg	03/19 10:41

5	4	efg	03/19 10:42
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System Design:

Discuss how you would design a link shortener application.

Name and explain the common HTTP Request methods

Algorithm coding sample:

// 字符串每三个字符输出一下 例如 : abcd 输出abc bcd

```
public class repeatNgram {  
    public static List<String> helper(String s, int k) {  
        List<String> list = new ArrayList<String>();  
        if(s == null || s.length() == 0) return list;  
        for(int i=0; i<=s.length() - k; i++) {  
            String subResult = s.substring(i, i+k);  
            list.add(subResult);  
        }  
        return list;  
    }  
}
```

// Given a string s, and a number n, return the most common n-gram in s

```
public static String helper(String s, int n) {  
  
    if (s == null || s.length() == 0) return "";  
    if (n >= s.length()) return s;  
    StringBuilder sb = new StringBuilder();  
  
    HashMap<String, Integer> map = new HashMap<String, Integer>();  
    for(int i=0; i<s.length()-n; i++) {  
        String cur = s.substring(i, i+n);  
        map.put(cur, map.getOrDefault(cur, 0) + 1);  
    }  
  
    String lastStr = s.substring(s.length() - n);  
    map.put(lastStr, map.getOrDefault(lastStr, 0) + 1);  
  
    int max = 0;  
    String result = "";  
    for(Map.Entry<String, Integer> entry : map.entrySet()) {  
        if(max < entry.getValue()) {  
            max = entry.getValue();  
            result = entry.getKey();  
        }  
    }  
    return result;  
}
```

// two sum

```
public class twoSum {  
    // two for each loop with hashset, time  $O(N^2)$  space  $O(N)$   
    public static int[] twoSum2(int[] nums, int target) {  
        if(nums == null || nums.length == 0) return new int[] {};  
        List<Integer> list = new ArrayList<>();  
        HashSet<Integer> set = new HashSet<Integer>();  
        // two for each loops  
        for(int i=0; i<nums.length-1; i++) {  
            for(int j=1; j<nums.length; j++) {  
                if(nums[i] + nums[j] == target && set.add(nums[i]) && set.add(nums[j])) {  
                    list.add(nums[i]);  
                    list.add(nums[j]);  
                }  
            }  
        }  
        int[] result = new int[list.size()];  
        int i = 0;  
        while(i < list.size()) {  
            result[i] = list.get(i);  
            i++;  
        }  
        return result;  
    }  
}
```

// hashmap set and list time complex $O(n)$, space complex $O(n)$

```
public static int[] twoSum3(int[] nums, int target) {  
    if(nums == null || nums.length == 0) return new int[] {};  
    HashMap<Integer, Integer> map = new HashMap<>(); // the value of element, the index of element  
    HashSet<Integer> set = new HashSet<Integer>(); // to avoid the duplicated value  
    List<Integer> list = new ArrayList<>();  
    for(int i=0; i<nums.length; i++) {  
        int remainValue = target - nums[i];  
        if(map.containsKey(remainValue) && set.add(remainValue)) {  
            list.add(remainValue);  
            list.add(nums[i]);  
        } else {  
            map.put(nums[i], i);  
        }  
    }  
    int[] result = new int[list.size()];  
    int i = 0;  
    while(i < list.size()) {  
        result[i] = list.get(i);  
        i++;  
    }  
    return result;  
}
```

// Merging two sorted arrays

class GFG

```
{
    public static int[] kth2(int[] arr1, int[] arr2, int k) {
        PriorityQueue<Integer> pq = new PriorityQueue<Integer>((a, b) -> b-a);
        int i = 0;
        int j = 0;
        int n = arr1.length;
        int m = arr2.length;

        while(i < n || j < m) {
            if(i < n) {pq.offer(arr1[i++]);}
            if(j < m) {pq.offer(arr2[j++]);}
            while(pq.size() > k) {pq.poll();}
        }
        int[] result = new int[k];
        int index = k-1;
        while(pq.size() > 0 || index > 0) {
            result[index--] = pq.poll();
        }
        return result;
    }

    public static int[] kth3(int[] num1, int[] num2, int k) {
        if((num1 == null && num2 == null) || (num1.length == 0 && num2.length == 0)) return new int[] {};
        int[] result = new int[k];
        int num1Len = num1.length;
        int num2Len = num2.length;
        int i = 0; // pointer for num1
        int j = 0; // pointer for num2
        int pointer = 0;
        while(i < num1Len && j < num2Len && pointer < k) {
            if(num1[i] < num2[j]) {
                result[pointer++] = num1[i];
                i++;
            } else {
                result[pointer++] = num2[j];
                j++;
            }
        }

        while(i < num1Len && pointer < k) {
            result[pointer++] = num1[i++];
        }

        while(j < num2Len && pointer < k) {
            result[pointer++] = num2[j++];
        }
        return result;
    }
}

/*
 * function to check whether characters of a string can form a palindrome
 */
```



```

static boolean canFormPalindrome(String str) {

    // Create a list
    List<Character> list = new ArrayList<Character>();

    // For each character in input strings,
    // remove character if list contains
    // else add character to list
    for (int i = 0; i < str.length(); i++) {
        if (list.contains(str.charAt(i)))
            list.remove((Character) str.charAt(i));
        else
            list.add(str.charAt(i));
    }

    // if character length is even list is expected to be empty
    // or if character length is odd list size is expected to be 1
    if (str.length() % 2 == 0 && list.isEmpty() // if string length is even
        || (str.length() % 2 == 1 && list.size() == 1)) // if string length is odd
        return true;
    else
        return false;
    }
}

```

```

import java.io.*;
import java.util.*;

/*
 * To execute Java, please define "static void main" on a class
 * named Solution.
 *
 * If you need more classes, simply define them inline.
 */

```

```

/*
 * 0 < length < 10,000
 * [
 * [-1, 2, 7]
 * [0, 3, 11]
 * ]
 * limit = 3
 * 0 < limit < 100,000
 *
 *
 * [-1, 0, 2]
 */

```

```

// 0 < lengthLists < 10,000

```

```

class Node{
    int col;
    int row;
    int value;

    public Node(int row, int col, int value) {
        this.row = row;
        this.col = col;
        this.value = value;
    }
}

```

```

class Solution {
    public static int[] sortedArrayKthVersion2(int[][] lists, int limit) {
        if(lists == null || lists.length == 0) return new int[]{};

        PriorityQueue<Node> pq = new PriorityQueue<Node>((Node node1, Node node2) ->
node1.value - node2.value);

        for(int i=0; i<lists.length; i++) {
            pq.offer(new Node(i, 0, lists[i][0]));
        }
        int[] result = new int[limit];
        int pointer = 0; // index of result

        while(!pq.isEmpty() && pointer < limit) {
            Node current = pq.poll();
            result[pointer++] = current.value;
        }
    }
}

```

```

        if (current.row < lists.length && current.col+1 < lists[current.row].length) {
            pq.offer(new Node(current.row, current.col + 1, lists[current.row][current.col+1]));
        }
    }

    return result;
}

public static int[] sortedArrayKth(int[] arr1, int[] arr2, int limit){
    if((arr1 == null && arr2 == null) || (arr1.length == 0 && arr2.length == 0)) return new int[]{};

    int[] result = new int[limit];

    int pointer1 = 0; // index of arr1
    int pointer2 = 0; // index of arr2
    int pointer = 0; // index of result

    while(pointer1 < arr1.length && pointer2 < arr2.length && pointer < limit) {

        if(arr1[pointer1] < arr2[pointer2]) {
            result[pointer++] = arr1[pointer1];
            pointer1++;
        } else {
            result[pointer++] = arr2[pointer2];
            pointer2++;
        }
    }

    // append rest of elements into result, limit > arr2
    while(pointer < limit && pointer1 < arr1.length) {
        result[pointer++] = arr1[pointer1++];
    }

    // append rest of elements into result, limit > arr1
    while(pointer < limit && pointer2 < arr2.length) {
        result[pointer++] = arr2[pointer2++];
    }
    return result;
}

public static void main(String[] args) {
    int[] arr1 = new int[]{};
    int[] arr2 = new int[]{0, 3, 11};

```

```
int limit = 3;

int[] lists = new int[]{{-1, 2, 7}, {0, 3, 11}};
System.out.println(Arrays.toString(sortedArrayKthVersion2(lists, limit)));
}
}
```