**Merge Two Sorted Array with o(1) space**

Approached 1: Insertion sort approached here

* Loop from the first position to the last of the first.
* Take the first element of b array always
* Check the a[i]>b[0]
  + If b[0] is greater then , swap with a[i];
* At the swap , we need to sort out the array b fully

Space complexity o(1)

Time Complexity o(n)\*o(mlogm)

**Approached 2: Gap Algorithm here**

Ceil function gap= (a+b)/2;

**Find the Departure Destination City : 23-05-2022**

**Algorithm**

* First to find out the starting position
  + Make a reverse pair of value as a key and key as a value
  + Now just use a for loop and check whether the reverse pair key is present in dataset or not
  + If it does not contains make it as a starting point.

After getting the starting point do this coding

String to =dataSet.get(startingPoint);

**while**(to!=**null**)

{

System.***out***.print(startingPoint+"->"+to+", ");

startingPoint=to;

to=dataSet.get(to);

}

**Find the Substring count in the string in java :24-05-2022**

**Question :**

**String a=”abcdabcghggabcaabcbcbcabc”**

**Count of abc in the string**

**Algorithm**

**Int i=3;**

**while**(i!=a.length())

{

**if**(a.charAt(i)=='c')

{

**if**(a.charAt(i-1)=='b' && a.charAt(i-2)=='a')

{

c++;

}

}

i++;

}

**Steps**

1. **While loop is executing when the variable I does not equal to length of array.**
2. **We need to see the character is C or not , if c please check the previous is b and next to previous to a**
3. **If the 2 point follow then increase the count.**
4. **After the condtion , increase the i++;**

**Longest Sub contiguous sum Subarray in Java : 27-05-2022**

**Algorithm**

Kandane’s Algorithm

Array = -2,-3,4,-1,2,1,5,-3

1. Take two variable meh and msf
2. Meh=0 , msf=minimum value of integer
3. For loop is executing form o to a.length
4. Take a every sum inside meh
5. Now check the condition meh is greater than msf
6. If found greater msf=meh
7. If meh<0
8. Then reset the msf

Code here

**int** meh=0;

**int** msf=Integer.***MIN\_VALUE***;

**for**(**int** i=0;i<a.length;i++)

{

meh=meh+a[i];

**if**(meh>msf)

{

msf=meh;

}

**if**(meh<0)

{

meh=0;

}

}

System.***out***.println(msf);

**Space complexity -o()**

**Time Complexity – 0(n)**

**Sort 0 and 1 in single time and extra space 27-05-2022**

**Approached 1 with extra space:Two pointer approached**

**int** a[]= {0, 1, 0, 1, 0, 0, 1, 1, 1, 0};

1. Take a new array(b) of size a.length
2. Take two variable start=0 and end =a.length-1
3. Take a for loop from o to a.length-1
4. If a[i]==0
5. Put b[s]=a[i] then s++;
6. If a[i]==1
7. Put b[e]=a[i] then e--;
8. Now print b and b is sorted in nature

Code -> **int** b[]=**new** **int**[a.length];

**int** s=0;

**int** c=b.length-1;

**for**(**int** i=0;i<a.length;i++) {

**if**(a[i]==0)

{

b[s]=a[i];

s++;

}

**else**{

b[c]=a[i];

c--;

}

}

Space o(n)

Time 0(n)

**Approached 2 with o(1) space complexity and o(n) with time complexity**

1. Take s=0 and e=a.length-1
2. While(s<=e)
3. Check if a[s]==0, if 0 then s++;
4. Check if a[s]==1 and a[e]==1 then e--;
5. If a[s]==1 and a[e]==0 then swap it a[s]=0 and a[e]=1;

Code

**int** s=0;

**int** e=a.length-1;

**while**(s<=e)

{

**if**(a[s]==0)

{

s++;

}

**else** **if**(a[s]==1 && a[e]==1)

{

e--;

}

**else** **if**(a[s]==1 && a[e]==0)

{

a[s]=0;

a[e]=1;

}

}

**Space – o(1)**

**Time – o(n)**

**Merge Intervals 31:05:2021**

Input [[1,3][2,6][8,10][15,18]]

Output [[1,6][8,10][15,18]]

**Approached 1:**

**Sort 012 27-05-2022**

**int a[]= {0,1,2,0,0,1,2,1,0,1,2,0,1};**

**Approached 1 –with extra space**

**Count the frequency of character without any collections –o(n2)**

**Steps**

**Make a new array of the size of inputted array**

**Make a new variable and initailse it with -1**

**Now nested for loop is taken I=0 and j=i+1**

**In j loop , we need to check whether a[i]==a[j],**

**If we get any element frequency equal then we need to update the counter and make the repeated positon with -1 in the visited array**

**After the jth loop we need to update the count of the element in ith position and update the count of the element in the visited array**

**Please look up the code for better understanding**

**Time complexity – o(n2)**

**Space complexity -o(n)**

**package** com.YoutubeQuestion;

**import** java.util.Arrays;

**public** **class** ContainsDuplicateElement {

**public** **static** **void** main(String[] args) {

//count the frequency of character using the nested for loop`

**int** a[]={2,2,3,1,2,2,1,4,5,5,3};

**int** [] vi =**new** **int**[a.length];

**int** v=-1;

**for**(**int** i=0;i<a.length;i++)

{

**int** c=1;

**for**(**int** j=i+1;j<a.length;j++)

{

**if**(a[i]==a[j])

{

c++;

vi[j]=v;

}

}

**if**(vi[i]!=v)

{

vi[i]=c;

}

}

//now printing the frequency of the element

**for**(**int** i=0;i<a.length;i++)

{

**if**(vi[i]!=v) {

System.***out***.println("Array of i = "+a[i]+" counting of array is "+vi[i]);

}

}

}

}

**Count the frequency of the element In the array by o(n) time complexity**

**-----------------------------------------------------------------------**

**Steps :**

**Linked List**

**Find the middle of the element in the linked list**

**Apprached here**

**Min Max Sum (HackerRank )**

**Arr[1,3,5,7,9]**

**Min Sum =1+3+5+7=16**

**Max Sum =3+5+7+9=24**

**Solutions**

public static void miniMaxSum(List<Integer> arr) {

        long tot=0;

        int min =arr.get(0);

        int max=arr.get( 0);

        for(int i=0;i<arr.size();i++)

        {

            tot=tot+arr.get(i);

            if(arr.get(i)>max){

                max=arr.get(i);

            }

             if(arr.get(i)<min){

                min=arr.get(i);

            }

        }

        System.out.println(tot-max+" "+(tot-min));

    }

}

**Time Conversion**

Method 1 : BruteForce Approached

public static String timeConversion(String s) {

    System.out.println(s);

    String res="";

        if(s.contains("AM"))

        {

            int a=Integer.parseInt(s.substring(0,2));

             if(a==12){

            a=Math.abs(12-a);

            }

            String d=String.valueOf(a);

            res=d+s.substring(2,s.length()-2);

            if(res.length()==7)

            {

                res=0+res;

            }

            return res;

        }else{

             int a=Integer.parseInt(s.substring(0,2));

              if(a==12)

             {

                 a=12;

             }else {

                a=Math.abs(12+a);

             }

               // a=Math.abs(12+a);

                String d=String.valueOf(a);

                res=d+s.substring(2,s.length()-2);

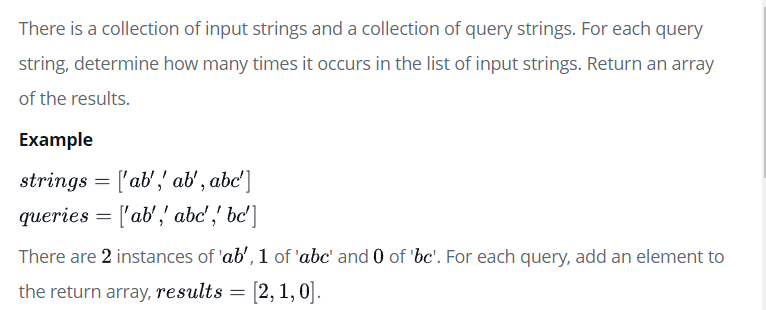
                 return res;

        }

    }

Sparse Arrays

<https://www.hackerrank.com/challenges/one-month-preparation-kit-sparse-arrays/problem?isFullScreen=true&h_l=interview&playlist_slugs%5B%5D=preparation-kits&playlist_slugs%5B%5D=one-month-preparation-kit&playlist_slugs%5B%5D=one-month-week-one>



Solutions:

 public static List<Integer> matchingStrings(List<String> strings, List<String> queries) {

        HashMap<String,Integer> a=new HashMap<>();

        for(int i=0;i<strings.size();i++)

        {

            if(!a.containsKey(strings.get(i)))

            {

                a.put(strings.get(i), 1);

            }else{

                a.put(strings.get(i),a.get(strings.get(i))+1);

            }

        }

        List<Integer> aa=new ArrayList<>();

        for(int i=0;i<queries.size();i++)

        {

            if(a.containsKey(queries.get(i)))

            {

                aa.add(a.get(queries.get(i)));

            }

            else{

                aa.add(0);

            }

        }

        return aa;

    }

**Linked Liist**

1. **Rotate a linked list to the k th position Date 20—7-2022**

**----------------------------------------------------------**

**Approached**

**Traverse the list upto the k th position**

**And reached at the last and point the last.next to the head.**

**When reached to the k th position , mark the k.next to null;**

**And the k+1 to head.**

**Let See in code this**

**Contains Duplicate**

**public** **static** **void** main(String[] args) {

**int** n[]= {1,2,3,4,5};

Set<Integer> aset=**new** HashSet<Integer>();

**for**(**int** a:n)

{

**if**(!aset.add(a))

{

System.***out***.println("Return true");

**break**;

}

}

}

**Time Complexity – O(n)**

**Group Anagram Date :29:07:2022**

**Approached 🡪First of all take the string , convert the string into character array and then sort it after sorting put the key and create a new Arraylist object for each of the key, One you get that please put the key inside the arraylits which u save null previously.**

**public** **static** List<List<String>> groupAnagrams(String[] s) {

List<List<String>> aa=**new** ArrayList<>();

Map<String,List<String>> amap=**new** HashMap<>();

**for**(**int** i=0;i<s.length;i++)

{

**char** ss[]=s[i].toCharArray();

Arrays.*sort*(ss);

String w=String.*valueOf*(ss);

**if**(!amap.containsKey(w))

{

amap.put(w, **new** ArrayList<>());

}

amap.get(w).add(s[i]);

}

//convert the hashmap value into the list

**for**(Map.Entry<String, List<String>> k:amap.entrySet())

{

aa.add(k.getValue());

}

**return** aa;

}

**Code No 3: Find the KthTopFrequent Element in java :29/07/2022**

By Using the priority Queue we can solve the questions

**Code no 4:Largest and smallest element using the priority queue appproacjed**

//largest element code

**private** **static** **void** priorityQuiz(**int**[] k,**int** w) {

PriorityQueue<Integer> aa=**new** PriorityQueue<>();

**for**(**int** i=0;i<w;i++)

{

aa.add(k[i]);

}

**for**(**int** i=w;i<k.length;i++)

{

**if**(aa.peek()<k[i])

{

aa.poll();

aa.add(k[i]);

}

}

System.***out***.println(aa.peek());

}

//smalllest element code

//largest element code

**private** **static** **void** priorityQuisz(**int**[] k,**int** w) {

PriorityQueue<Integer> aa=**new** PriorityQueue<>(Collections.*reverseOrder*());

**for**(**int** i=0;i<w;i++)

{

aa.add(k[i]);

}

**for**(**int** i=w;i<k.length;i++)

{

**if**(aa.peek()>k[i])

{

aa.poll();

aa.add(k[i]);

}

}

System.***out***.println(aa.peek());

}

**Code No 5 Date 30/07/2022**

**Leaders in an army**

**static ArrayList<Integer> leaders(int arr[], int n){**

**ArrayList<Integer> aa=new ArrayList<>();**

**aa.add(arr[arr.length-1]);**

**int m=arr[arr.length-1];**

**for(int i=arr.length-2;i>=0;i--){**

**if(arr[i]>=m)**

**{**

**m=arr[i];**

**aa.add(m);**

**}**

**}**

**Collections.reverse(aa);**

**return aa;**

**}**

**Code No6**

**Equiliberium Point**

public static int equilibriumPoint(long arr[], int n) {

long sum=0;

long ls=0;

for(int i=0;i<arr.length;i++)

{

sum=sum+arr[i];

}

for(int i=0;i<arr.length;i++)

{

sum=sum-arr[i];

if(sum==ls)

{

return i+1;

}

ls=ls+arr[i];

}

return -1;

}

**Sort an array of 0/s 1.s and 2’s**

Int s=0;

Int high=a.length-1;

Int mid=0;

While(mid<=high)

{

Switch(a[mid)){

Case 0:{

//swap the low and mid

M++;

L++;

Break;

}

Case 1:{

L++;

Break;

}

Case 2:{

Swap the high and mid;

h--;

break;

}

}

}

Time o(n);

Space o(1);

Algorithms

Searching

Linear Search

**private** **static** **void** linearSearchExample(**int**[] a, **int** t) {

**for**(**int** i=0;i<a.length;i++)

{

**if**(a[i]==t)

{

System.***out***.println("Element Found at location "+i);

**break**;

}

}

}

Time – o(n)

Space -o(1)

Binary Search

**private** **static** **void** SearchTheElement(**int**[] a, **int** i) {

**int** low=0;

**int** high=a.length-1;

**int** mid=0;

**boolean** flag=**false**;

//binary search algorithm uses two pointer approached

**while**(low<=high)

{

mid=(low+high)/2;

//greater

**if**(a[mid]>i)

{

high--;

}

**if**(a[mid]<i)

{

low=mid;

}

//smaller

//if mid

**if**(a[mid]==i)

{

flag=**true**;

System.***out***.println("Element found at position "+mid);

**break**;

}

}

}

Time Complexity 🡪o(logn)

Space Complexity 🡪O(1)

Date 01/08/2022

Inversion Count of an array

Need to Read first the Merge sort then implement this questions

Sorting Algorithm

Bubble Sort Example