

#TCS NQT All Coding Questions & Solutions

- TCS Coding Questions | Live Session-1

Video Link:

<https://www.youtube.com/live/9vzhHngeuaY?si=Su4erfY64VcVHhaJ>

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- Solutions: <https://newoffcampusjobs.com/tcs-nqt-coding-questions>

- TCS Coding Questions | Recorded Video

Video Link: <https://youtu.be/s8TVayhyOps?si=9ubwESrUrpKnNMov>

TCS NQT Exam Preparation (Advanced Section- Coding)



Given an array consists of n elements you have to print the elements which has appeared even number of times

- N size of array
- Next line contains elements of array
Print the elements which has appeared even number of times

Constraints:

Size of array should be greater than zero

Elements of array should be greater than zero

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TCS NQT Exam Preparation (Advanced Section- Coding)

Input Format:

- I) The first line of input contains the value N size of array
- II) The second line of input contains elements of array

Output Format:

Print the elements which have appeared even number of times



Sample Input1:

N=5

L=1 1 2 3 2

Sample Output 1:

1 2 (As 1 is appeared 2 times and 2 has appeared 2 times which is even so we print element 1 and 2)

C++ Code:

C++ code

```
#include<bits/stdc++.h>
using namespace std;
int main(){

    int n;// number of elements in array

    cin>>n;
    vector<int>arr;
    for(int i=0;i<n;i++){
        int k;
        cin>>k;
        arr.push_back(k);// this is taking input of array
    }
    map<int,int>mp;// map to store key and value

    for(int i=0;i<n;i++){
        if(mp.find(arr[i])==mp.end()){// check wheather the element is
            previously their or not
        //  not their in hashmap
        mp[arr[i]]=1;
```

```
    }

else{
    // the element is already their in map
    mp[arr[i]]++;
}

for(auto i:mp){
    if(i.second%2==0){
        cout<<i.first<<" ";
    }
}

return 0;
}
```

Python Code:

```
from collections import defaultdict

n = int(input()) # number of elements in array
arr = list(map(int, input().split())) # input array

mp = defaultdict(int) # dictionary to store key and value

for i in range(n):
    mp[arr[i]] += 1 # count frequency of each element

for key, value in mp.items():
    if value % 2 == 0:
```

```
print(key, end=" ")
```

Java Code:

```
import java.util.HashMap;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        int n = scanner.nextInt(); // number of elements in array
        int[] arr = new int[n]; // input array

        // Taking input of array
        for (int i = 0; i < n; i++) {
            arr[i] = scanner.nextInt();
        }

        HashMap<Integer, Integer> mp = new HashMap<>(); // HashMap to store key and value

        // Counting frequency of each element
        for (int i = 0; i < n; i++) {
            if (!mp.containsKey(arr[i])) { // check whether the element is previously there or not
                mp.put(arr[i], 1); // not there in hashmap
            } else {
                // the element is already there in map
                mp.put(arr[i], mp.get(arr[i]) + 1);
            }
        }

        // Printing elements with even frequencies
        for (HashMap.Entry<Integer, Integer> entry : mp.entrySet()) {
            if (entry.getValue() % 2 == 0) {
                System.out.print(entry.getKey() + " ");
            }
        }
    }
}
```

● TCS Coding Questions | Live Session-2

Video Link:

<https://www.youtube.com/live/wfwIVq44nul?si=8dytBqt1AAVKgYyV>

Q1.

TCS NQT Exam Preparation (Advanced Section- Coding)



Given a number in you have to toggle all its bits in binary form toggle means change 1 to 0 and vice versa and print the number after toggling the bit

a) N is the number

Constraints:

N should be greater than zero

Python

```
# # Take the value of N as input  
# N=int(input())
```

```
# # this will convert the number from decimal to binary
```

```
# binary=bin(N)[2:]
```

```
# st=""
```

```
# for i in binary:
```

```
# if i=='1':
```

```
# st+='0'
```

```
# # toggling the bit if at that position 1 is their we need to addd 0 and vice versa  
# else:  
# st+='1'
```

```
# # this will convert number from binary to decimal  
# print(int(st,2))
```

C++

```
#include <iostream>  
#include <string>  
#include <cmath>  
using namespace std;  
  
int main() {  
    int N;  
    cin >> N;  
  
    // Convert the number from decimal to binary  
    string binary = "";  
    while (N > 0) {  
        binary = to_string(N % 2) + binary;  
        N /= 2;  
    }  
    // Toggle the bits  
    string st = "";
```

```
for (char i : binary) {  
    if (i == '1') {  
        st += '0';  
    } else {  
        st += '1';  
    }  
}  
  
// Convert the number from binary to decimal  
int result = 0;  
for (int i = st.size() - 1; i >= 0; i--) {  
    if (st[i] == '1') {  
        result += pow(2, st.size() - 1 - i);  
    }  
}  
cout << result << endl;  
return 0;  
}
```

Java

```
import java.util.Scanner;  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);
```

```
int N = scanner.nextInt();

// Convert the number from decimal to binary

String binary = Integer.toBinaryString(N);

// Toggle the bits

StringBuilder st = new StringBuilder();

for (char i : binary.toCharArray()) {

    if (i == '1') {

        st.append('0');

    } else {

        st.append('1');

    }
}

// Convert the number from binary to decimal

int result = Integer.parseInt(st.toString(), 2);

System.out.println(result);
}
```

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Q2.

TCS NQT Exam Preparation (Advanced Section- Coding)



Given a string you have to count vowels, consonants ,digits and special character in



- a) S is a string

Constraints:

N should be greater than zero and consists of lowercase english letter and does not contains spaces

Python

```
# this will take string as a input
S=input()

# four variable for storing the count of vowels, consonants, digits,special
vowel=0

consonant=0

digit=0

special=0

vowels="aeiou"

digits="0123456789"

specials="@#$%!*&^"

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```

for i in S:

```
if i in vowels:  
    vowel+=1  
  
elif i not in digits and i not in specials:  
    consonant+=1  
  
elif i in digits:  
    digit+=1  
  
else:  
    special+=1  
  
print(vowel,consonant,digit,special)
```

C++

```
#include <iostream>  
  
#include <string>  
  
using namespace std;  
  
int main() {  
  
    string S;  
  
    getline(cin, S);  
  
    int vowel = 0, consonant = 0, digit = 0, special = 0;  
  
    string vowels = "aeiou";  
  
    string digits = "0123456789";  
  
    string specials = "@#$%!*&^";  
  
    for (char i : S) {  
  
        if (vowels.find(i) != string::npos) {
```

```
vowel++;

} else if (digits.find(i) == string::npos && specials.find(i) == string::npos) {

consonant++;

} else if (digits.find(i) != string::npos) {

digit++;

} else {

special++;

}

}

cout << vowel << " " << consonant << " " << digit << " " << special << endl;

return 0;

}
```

Java

```
import java.util.Scanner;

public class Main {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

String S = scanner.nextLine();

int vowel = 0, consonant = 0, digit = 0, special = 0;

String vowels = "aeiou";

String digits = "0123456789";

String specials = "@#$%!*&^";

for (char i : S.toCharArray()) {
```

```
if (vowels.contains(Character.toString(i))) {  
    vowel++;  
}  
} else if (!digits.contains(Character.toString(i)) &&  
!specials.contains(Character.toString(i))) {  
    consonant++;  
}  
} else if (digits.contains(Character.toString(i))) {  
    digit++;  
}  
} else {  
    special++;  
}  
}  
}  
}  
System.out.println(vowel + " " + consonant + " " + digit + " " + special);  
}  
}
```

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● TCS Coding Questions | Live Session- 3

Video Link:

<https://www.youtube.com/live/dvoqj5tUScl?si=ZJoti407v6l5jsHV>

Q1.

The Metro station security officials have confiscated several item of the passengers at the security check point. All the items have been dumped into a huge box (array). Each item possesses a certain amount of risk[0,1,2,3]. Here, the risk severity of the items represent an array[] of N number of integer values. The task here is to sort the items based on their levels of risk in the array. The risk values range from 0 to 3.

- a) N is the number of elements of array
- b) Next N lines contains value of array

Constraints:

N should be greater than zero

Array contains only the values 0, 1, 2,3

Python

```
arr=[0,1,2,3,1,2]
```

```
zeros=0
```

```
ones=0
```

```
twos=0
```

```
threes=0
```

```
for i in arr:
```

```
    if i==0:
```

```
        zeros+=1
```

```
    elif i==1:
```

```
        ones+=1
```

```
    elif i==2:
```

```
twos+=1  
else:  
    threes+=1
```

```
i=0
```

```
n=len(arr)
```

```
while i<n:
```

```
    while zeros>0:
```

```
        arr[i]=0
```

```
        zeros-=1
```

```
        i+=1
```

```
    while ones>0:
```

```
        arr[i]=1
```

```
        ones-=1
```

```
        i+=1
```

```
    while twos>0:
```

```
        arr[i]=2
```

```
        twos-=1
```

```
        i+=1
```

```
    while threes>0:
```

```
        arr[i]=3
```

```
        threes-=1
```

i+=1

print(arr)

C++:

```
#include <iostream>
#include <vector>
using namespace std;

int main() {
    vector<int> arr = {0, 1, 2, 3, 1, 2};
    int zeros = 0, ones = 0, twos = 0, threes = 0;
    for (int i : arr) {
        if (i == 0)
            zeros++;
        else if (i == 1)
            ones++;
        else if (i == 2)
            twos++;
        else
            threes++;
    }
    int i = 0, n = arr.size();
    while (i < n) {
        while (zeros > 0) {
            arr[i] = 0;
```

```
zeros--;
i++;
}

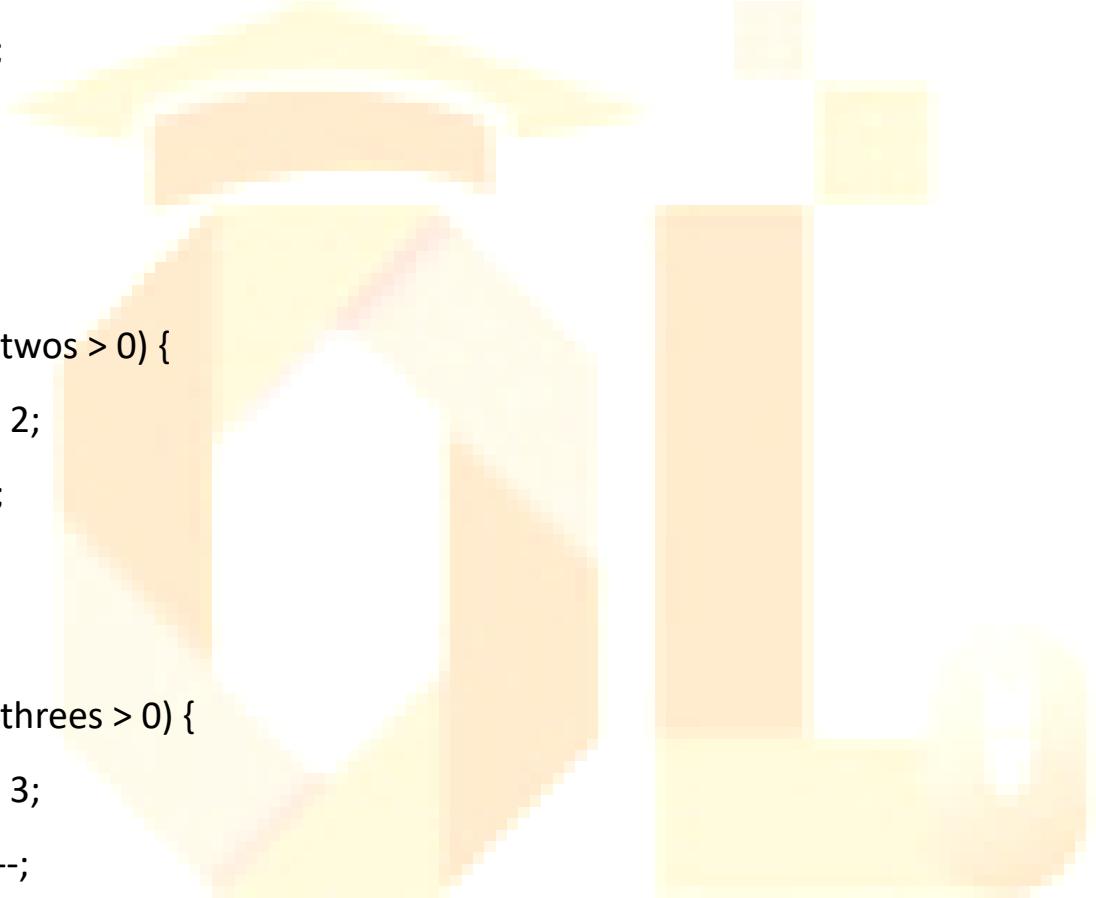
while (ones > 0) {
arr[i] = 1;
ones--;
i++;
}

while (twos > 0) {
arr[i] = 2;
twos--;
i++;
}

while (threes > 0) {
arr[i] = 3;
threes--;
i++;
}

for (int num : arr) {
cout << num << " ";
}
cout << endl;

return 0;
```



```
}
```

Java

```
#include <iostream>
#include <string>
#include <map>
using namespace std;

// Function to sort the string based on the key string
string sortString(string s, const string& key) {
    map<char, int> charCount; // Map to store character count based on key
    string sortedString;
    for(char c : s) {
        charCount[c]++;
    }
    for(char c : key) {
        if(charCount.find(c) != charCount.end()) {
            sortedString += string(charCount[c], c); // Append characters in the order
            // specified by
            // the key string
            charCount.erase(c); // Remove the character from the map once
            // appended
        }
    }
}
```

```
return sortedString;  
}  
  
int main() {  
    string s, key;  
    cout << "Enter the string: ";  
    cin >> s;  
    cout << "Enter the key string: ";  
    cin >> key;  
    string sortedString = sortString(s, key);  
    cout << "The sorted string based on the key string is: " << sortedString <<  
    endl;  
    return 0;  
}
```

Q2.

TCS NQT Exam Preparation (Advanced Section- Coding)

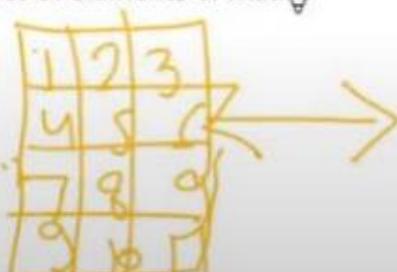


Given a NxN Matrix you have to rotate the matrix by 90 degree in clockwise direction and print the resultant matrix

- a) N that is size of matrix
- b) Next NXN contains the values of elements of matrix

Constraints:

N should be greater than zero



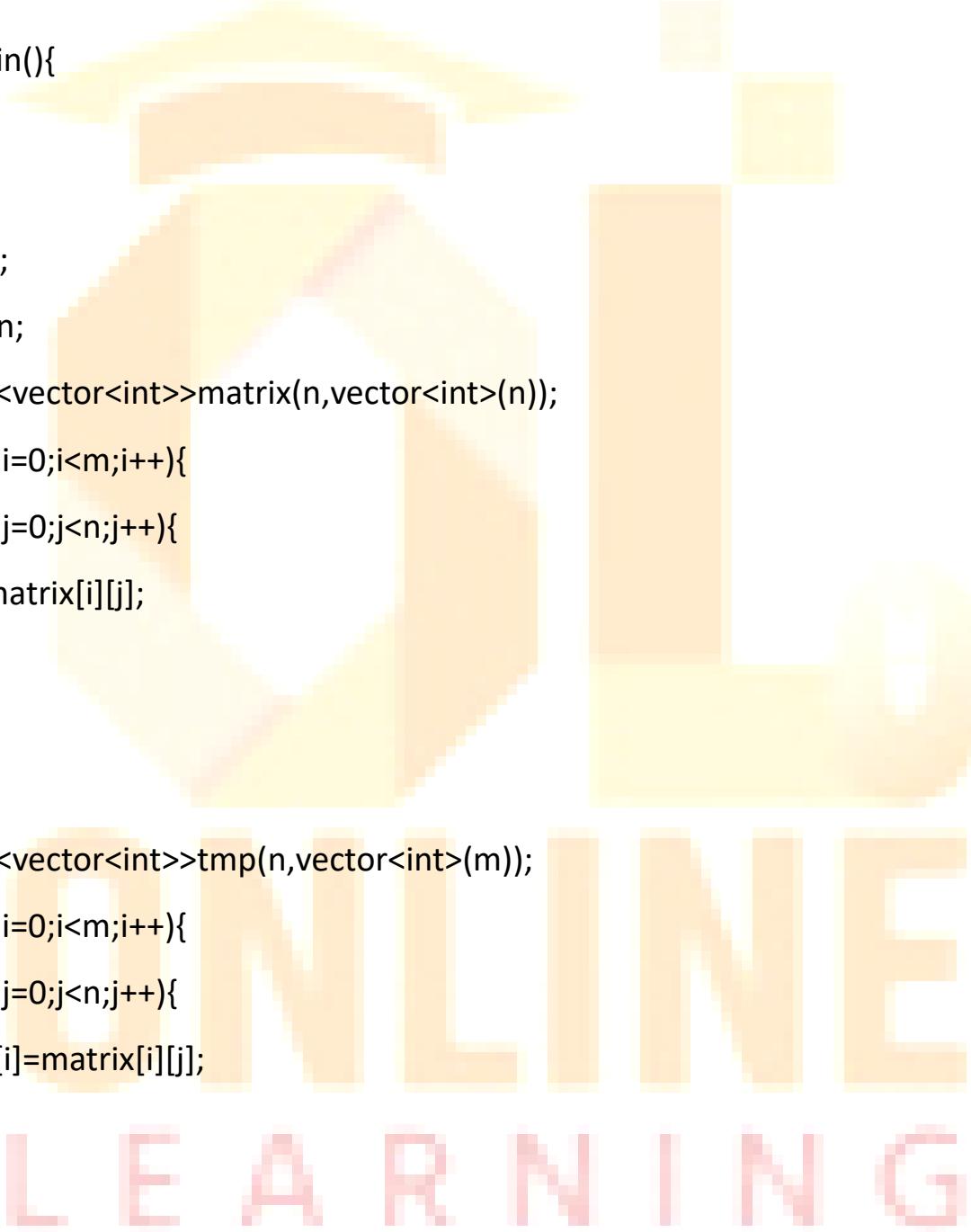
C++

```
#include<bits/stdc++.h>
using namespace std;

int main(){
    int n;
    cin>>n;
    int m=n;
    vector<vector<int>>matrix(n,vector<int>(n));
    for(int i=0;i<m;i++){
        for(int j=0;j<n;j++){
            cin>>matrix[i][j];
        }
    }

    vector<vector<int>>tmp(n,vector<int>(m));
    for(int i=0;i<m;i++){
        for(int j=0;j<n;j++){
            tmp[j][i]=matrix[i][j];
        }
    }

    int t=0;
```



```
for(auto i:tmp){  
    auto curr=i;  
    reverse(curr.begin(),curr.end());  
    matrix[t++]=curr;  
    // cout<<endl;  
}
```

```
for(auto i:matrix){  
    for(auto j:i){  
        cout<<j<<" ";  
    }  
    cout<<endl;  
}
```

```
return 0;  
}
```

Java

```
import java.util.Scanner;  
import java.util.ArrayList;  
import java.util.Collections;  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        int n = scanner.nextInt();
```

```
int m = n;

ArrayList<ArrayList<Integer>> matrix = new ArrayList<>();

for (int i = 0; i < m; i++) {

    ArrayList<Integer> row = new ArrayList<>();

    for (int j = 0; j < n; j++) {

        row.add(scanner.nextInt());
    }

    matrix.add(row);
}

ArrayList<ArrayList<Integer>> tmp = new ArrayList<>();

for (int i = 0; i < n; i++) {

    ArrayList<Integer> row = new ArrayList<>();

    for (int j = 0; j < m; j++) {

        row.add(matrix.get(j).get(i));
    }

    tmp.add(row);
}

int t = 0;

for (ArrayList<Integer> row : tmp) {

    Collections.reverse(row);

    matrix.set(t++, row);
}

for (ArrayList<Integer> row : matrix) {

    for (int value : row) {

        System.out.print(value + " ");
    }
}
```

```
}

System.out.println();

}

scanner.close();

}

}
```

Python

```
# Taking input
n = int(input())
m = n
matrix = []
for i in range(m):
    row = list(map(int, input().split()))
    matrix.append(row)
# Transposing the matrix
tmp = []
for i in range(n):
    row = []
    for j in range(m):
        row.append(matrix[j][i])
    tmp.append(row)
# Reversing each row of the transposed matrix
t = 0
```

```
for row in tmp:  
    row.reverse()  
    matrix[t] = row  
  
    t += 1  
  
# Printing the result  
  
for row in matrix:  
    print(*row)
```

📍 TCS Coding Questions | Live Session- 4

Video Link:

<https://www.youtube.com/live/gk14bMeU6Ss?si=1thtwpcGyxg0zVsU>

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Q1.

TCS NQT Exam Preparation (Advanced Section- Previous year Coding questions)



Given a string in small case with repeating character in it number p will be threshold character count record the frequency of repeating character count of repeating characters. Write a program to print only first character from the string which has count greater than or equal to p and in case of multiple character print the character which is alphabetic smallest.(TCS NQT off campus 2023)

C++:

```
#include <iostream>
#include <map>
#include <algorithm>
using namespace std;

int main() {
    string s;
    cin >> s;
    int p;
    cin >> p;
    map<char, int> mp;
    for (char i : s) {
        mp[i]++;
    }
    string tmp = "";
```

```
for (auto i : mp) {  
    if (i.second >= p) {  
        tmp += i.first;  
    }  
}  
  
sort(tmp.begin(), tmp.end());  
  
cout << tmp[0] << endl;  
  
return 0;  
}
```

Java:

```
import java.util.HashMap;  
import java.util.Map;  
import java.util.Scanner;  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        String s = scanner.nextLine();  
        int p = scanner.nextInt();  
  
        Map<Character, Integer> mp = new HashMap<>();  
        for (char c : s.toCharArray()) {  
            mp.put(c, mp.getOrDefault(c, 0) + 1);  
        }  
        String tmp = new StringBuilder();  
        for (Map.Entry<Character, Integer> entry : mp.entrySet()) {  
            if (entry.getValue() >= p) {  
                tmp.append(entry.getKey());  
            }  
        }  
        System.out.println(tmp.toString());  
    }  
}
```

```
if (entry.getValue() >= p) {  
    tmp.append(entry.getKey());  
}  
}  
  
char[] tmpArr = tmp.toString().toCharArray();  
java.util.Arrays.sort(tmpArr);  
System.out.println(tmpArr[0]);  
}  
}
```

Python:

```
s = input()  
p = int(input())  
mp = {}  
for c in s:  
    mp[c] = mp.get(c, 0) + 1  
tmp = ""  
for key, value in mp.items():  
    if value >= p:  
        tmp += key  
tmp = sorted(tmp)  
print(tmp[0])
```

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Q2.

TCS NQT Exam Preparation (Advanced Section-Previous year Coding question)



Like animals, people, things around us are classified into various. The number of years is also grouped. The grouping of years is different in different calendar systems. In the western countries, a group of 10 years called a decade, a group of 100 years is called a century. Given a particular year(N), the task here is to find to which century it belongs to. The first century starts from 1 and completes at 100, second century at 101 to 200 and so on.

Given a particular year the task here is to find to which century it belongs to. The first century start from 1 and completed at 100, second century at 101 and 200 and so on. (TCQ NQT off campus 2023)

Python

```
n=int(input())
if n%100==0:
    print(n//100)
else:
    print((n//100)+1)
```

Java

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
```

```
Scanner scanner = new Scanner(System.in);
int n = scanner.nextInt();
if (n % 100 == 0) {

    System.out.println(n / 100);
} else {
    System.out.println((n / 100) + 1);
}
}
```

C++

```
#include <iostream>
using namespace std;
int main() {
    int n;
    cin >> n;
    if (n % 100 == 0) {
        cout << n / 100 << endl;
    } else {
        cout << (n / 100) + 1 << endl;
    }
    return 0;
}
```

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💡 TCS Coding Questions | Live Session- 5

Video Link: <https://www.youtube.com/live/IFk1Sh9sPNk?si=rEZcTFN8-Dv-Nunr>

Q1.

TCS NQT Exam Preparation (Advanced Section- Previous year Coding questions)



Time is integral part of our life. Soci horology which is the discipline of studying time and clock making. A watchmaker is passionate about delivering the best watches with accurate time all over the world. Each watch he makes, he tests the time in it with a standard watch showing GMT of his place. The task here is to find if the new watch he made is working correctly and find the number of minutes (delay or early) such that: Compare the initial time (h, m) and the current time (h1,m1) in the new watch. The time after X hours in the new watch may be correct or incorrect.

Display the number of minutes by which new watch is lagging or early from the actual time. Display the number of minutes by which new watch is lagging or early from the actual time. If the time is lagging display positive integer and if the time is early display the negative integer.

Given a initial time in h:m and current time h1:m2 and x display the delays in minutes in from the initial time after x hours (TCS off campus NQT 2023)

TCS NQT Exam Preparation (Advanced Section- Previous year Coding Question)

Input Format:

- 1) The first line of input contains the value h .
- 2) The second line of input contains the value m
- 3) The third line of input contains the value h1 .
- 4) The fourth line of input contains the value m2 .
- 5) The fifth line of input contains the value X .

Output Format:

Print the delay in minutes from initial hour after X hours if time is lagging display positive number and if time is early display the negative integer

Input h=8 m=45 h1=9 h2=00 X=1 Output 45

L E A R N I N G

C++

```
#include <iostream>
```

```
using namespace std;  
// This function will return the number of minutes in current time
```

```
int numberOfMinutesinTime(int h, int m) {  
    return h * 60 + m;  
}
```

```
int main() {  
    int h, m, h1, m1, x;  
    // Input format  
    cin >> h >> m >> h1 >> m1 >> x;  
    // Number of minutes in current time  
    int n = numberOfMinutesinTime(h, m);  
    // Number of minutes in target time  
    int target = numberOfMinutesinTime(h1, m1);  
    // Adding x hours to n  
    n += (x * 60);  
    cout << abs(target - n) << endl;  
    return 0;  
}
```

Java

```
import java.util.Scanner;  
public class Main {  
    // This function will return the number of minutes in current time  
    static int numberOfMinutesinTime(int h, int m) {
```

```
return h * 60 + m;  
}  
  
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    // Input format  
    int h = scanner.nextInt();  
    int m = scanner.nextInt();  
    int h1 = scanner.nextInt();  
    int m1 = scanner.nextInt();  
    int x = scanner.nextInt();  
    // Number of minutes in current time  
    int n = numberOfMinutesinTime(h, m);  
    // Number of minutes in target time  
    int target = numberOfMinutesinTime(h1, m1);  
    // Adding x hours to n  
    n += (x * 60);  
  
    System.out.println(Math.abs(target - n));  
    scanner.close();  
}
```

This function will return the number of minutes in current time

```
def numberOfMinutesinTime(h, m):  
    ans = h * 60 + m
```

```
return ans
```

Python

```
# Input format  
h = int(input())  
m = int(input())  
h1 = int(input())  
m1 = int(input())  
x = int(input())  
  
# Number of minutes in current time  
n = numberMinutesinTime(h, m)  
  
# Number of minutes in target time  
target = numberMinutesinTime(h1, m1)  
  
# Adding x hours to n  
n += (x * 60)  
  
print(abs(target - n))
```

Q2.

TCS NQT Exam Preparation (Advanced Section-Previous year Coding question)



A mall maintains a pricing format for all its products. A value N is printed on each product. When the scanner reads the value N on the item, the absolute difference between the product of all the digits in the value N and the sum of all the digits is the price of the item. The task here is to design the software such that given the code of any item N and returns the value of that item

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Python

```
# take the value of n as input
n = int(input())
# store the product of digits
pro = 1
# store the sum of digits
su = 0
s = str(n)
for i in s:
    pro *= int(i)
    su += int(i)
print(abs(pro - su))
```

C++

```
#include <iostream>
```

```
#include <string>
using namespace std;
int main() {
    // take the value of n as input
    int n;
    cin >> n;
    // store the product of digits
    int pro = 1;
    // store the sum of digits
    int su = 0;
    string s = to_string(n);
    for (char i : s) {
        pro *= (i - '0');
        su += (i - '0');
    }
    cout << abs(pro - su) << endl;
    return 0;
}
```

Java

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
```

```
Scanner scanner = new Scanner(System.in);
// take the value of n as input
int n = scanner.nextInt();
// store the product of digits
int pro = 1;
// store the sum of digits
int su = 0;
String s = Integer.toString(n);
for (int i = 0; i < s.length(); i++) {
    char c = s.charAt(i);
    pro *= Character.getNumericValue(c);
    su += Character.getNumericValue(c);
}
System.out.println(Math.abs(pro - su));
scanner.close();
}
```

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💡 TCS Coding Questions | Live Session- 6

Video Link:

<https://www.youtube.com/live/kLVoRICLX74?si=vskSnZIhtgZts9IG>

Q1.

TCS NQT Exam Preparation (Advanced Section- Previous year Coding questions)



Mike came up with a new way of sorting a string. What he does is he takes all the unique alphabets from the string and sorts it in that order. Let say there is a string "apple", now it contains aple as distinct alphabets. He sorts the string apple based on his own keys let say eapl So, first all "e" will be picked from the string "apple", and then all "a", and so on till l .Hence the final sorted word is eappl

Given string sort the string on basis of key string that is given Like s="apple" key="eapl" sort s on basis of key so answer is eappl (NQT off campus 2023)

💡 TCS Coding Questions | Live Session- 7

Video Link:

<https://www.youtube.com/live/00xE50OMYiQ?si=waxqNfsYWHUxB26g>

LEARNING

Q1.

Given a number as a string the task is that we divide number by 3. The input number may be large and it may not be possible to store even if we use long long int.

Ex: 3635883959606670431112222

Output Yes it is divisible by 3

(TCS NQT off campus 2023)

Python:

```
# # taking string as input
# N=input()
# # this will store the sum of digits
# su=0
# for i in su:
#     ch=int(i)
#     su+=ch
# if su%3==0:
#     print("Yes")
# else:
#     print("NO")
```

C++:

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    // Taking string as input
```

```
string N;  
cin >> N;  
// This will store the sum of digits  
int sum = 0;  
// Loop through each character in the input string  
for (char c : N) {  
    int digit = c - '0'; // Convert char to int  
    sum += digit; // Add digit to the sum  
}  
if (sum % 3 == 0) {  
    cout << "Yes" << endl;  
} else {  
    cout << "No" << endl;  
}  
return 0;  
}
```

Java:

```
import java.util.Scanner;  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        // Taking string as input  
        String N = scanner.next();  
        // This will store the sum of digits
```

```
int sum = 0;  
  
// Loop through each character in the input string  
  
for (char c : N.toCharArray()) {  
  
    int digit = Character.getNumericValue(c); // Convert char to int  
  
    sum += digit; // Add digit to the sum  
  
}  
  
if (sum % 3 == 0) {  
  
    System.out.println("Yes");  
  
} else {  
  
    System.out.println("No");  
  
}  
}  
}
```

Q2.

Coding questions

Hari likes sweets very much, so he is planning to go to the Island of Sweets. There are N NO villages in this island aligned with one unit difference between successive wages. Each village has its own sweet. Sweetness of each sweet is measured BigInteger and it is already known to Hari. Hari is planning to stay in each village for one day and he can easily get the sweets of any village which are at most K unit distance from Hari. On each day Hari will eat the sweet with maximum sweetness which he can get. Hari wants to make a decision to visit the island on the basis of the minimum of the sweetness values he will eat over the days (if goes there. Can you please help him to get the minimum sweetness value which he will get on the island? (TCS NQT off campus 2023)

LEARNING

Python:

```
# this is the input array
```

N=10

K=3

```
arr=[1,2,3,4,5,6,7,8,9,10]  
# this will store the final answer  
ans=float("inf")  
for i in range(N):  
  
    if i+K+1<N:  
        # take the subarray from i to i+K  
        sub=arr[i:i+K+1]  
        mi=max(sub)  
  
        ans=min(ans,mi)  
print(ans)
```

C++:

```
#include <iostream>  
#include <vector>  
#include <algorithm>  
#include <limits>  
using namespace std;  
int main() {  
    int N = 10;  
    int K = 3;
```

```
vector<int> arr = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

// This will store the final answer

int ans = numeric_limits<int>::max();

for (int i = 0; i < N; ++i) {

if (i + K + 1 < N) {

// Take the subarray from i to i+K

vector<int> sub(arr.begin() + i, arr.begin() + i + K + 1);

int mi = *max_element(sub.begin(), sub.end());

ans = min(ans, mi);

}

}

cout << ans << endl;

return 0;

}
```

JAVA:

```
import java.util.ArrayList;
import java.util.Arrays;
public class Main {
public static void main(String[] args) {
int N = 10;
int K = 3;
int[] arr = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
// This will store the final answer
```

```
int ans = Integer.MAX_VALUE;  
for (int i = 0; i < N; ++i) {  
    if (i + K + 1 < N) {  
        // Take the subarray from i to i+K  
        int[] sub = Arrays.copyOfRange(arr, i, i + K + 1);  
        int mi = Arrays.stream(sub).max().getAsInt();  
        ans = Math.min(ans, mi);  
    }  
}  
System.out.println(ans);  
}
```

📍 TCS Coding Questions | Live Session- 8

Video Link: <https://www.youtube.com/live/y1vfUrUDImc?si=R8FMZvSnm-WpTXY8>

Q1.

Coming Question,
In the mystical land of Numeria, whispered tales tell of a phenomenon known as Relative Blood Numbers. These numbers, shrouded in mystery, are said to possess a unique property wherein the sum of the factorials of their digits mirrors the number itself.

You, a valiant adventurer, have stumbled upon an ancient manuscript rumored to hold the key to unlocking the secrets of Relative Blood Numbers. Guided by the wisdom of the ages, you seek to uncover these elusive digits and unravel the mysteries they guard.

Tasked with deciphering the arcane riddles of Numeria, you must devise a method to identify whether a given number is indeed a Relative Blood Number or merely a mundane digit. Armed with your knowledge of factorials and the tales of old, embark on this quest of numerical exploration and uncover the truth hidden within the depths of

Python:

```
def fact(n):  
    if n==0 or n==1:  
        return 1  
  
    ans=1  
    for i in range(1,n+1):  
        ans*=i  
  
    return ans  
  
# this will take N as a input  
N=int(input())  
  
# this will store the sum of factorial of digits  
su=0  
  
for i in str(N):  
    su+=fact(int(i))  
  
if su==N:  
    print("Yes")  
  
else:
```

```
print("No")
```

C++

```
#include <iostream>
```

```
#include <cmath>
```

```
using namespace std;
```

```
int fact(int n) {
```

```
    if (n == 0 || n == 1) {
```

```
        return 1;
```

```
}
```

```
    int ans = 1;
```

```
    for (int i = 1; i <= n; i++) {
```

```
        ans *= i;
```

```
}
```

```
    return ans;
```

```
}
```

```
int main() {
```

```
    int N;
```

```
    cin >> N;
```

```
    int su = 0;
```

```
    for (char c : to_string(N)) {
```

```
        su += fact(c - '0');
```

```
}
```

```
    if (su == N) {
```

```
cout << "Yes" << endl;  
} else {  
    cout << "No" << endl;  
}  
return 0;  
}
```

Java

```
import java.util.Scanner;  
  
public class Main {  
  
    static int fact(int n) {  
  
        if (n == 0 || n == 1) {  
  
            return 1;  
        }  
  
        int ans = 1;  
  
        for (int i = 1; i <= n; i++) {  
  
            ans *= i;  
        }  
  
        return ans;  
    }  
  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        int N = scanner.nextInt();  
  
        int su = 0;
```

```
for (char c : String.valueOf(N).toCharArray()) {  
    su += fact(Character.getNumericValue(c));  
}  
  
if (su == N) {  
    System.out.println("Yes");  
} else {  
    System.out.println("No");  
}  
}
```

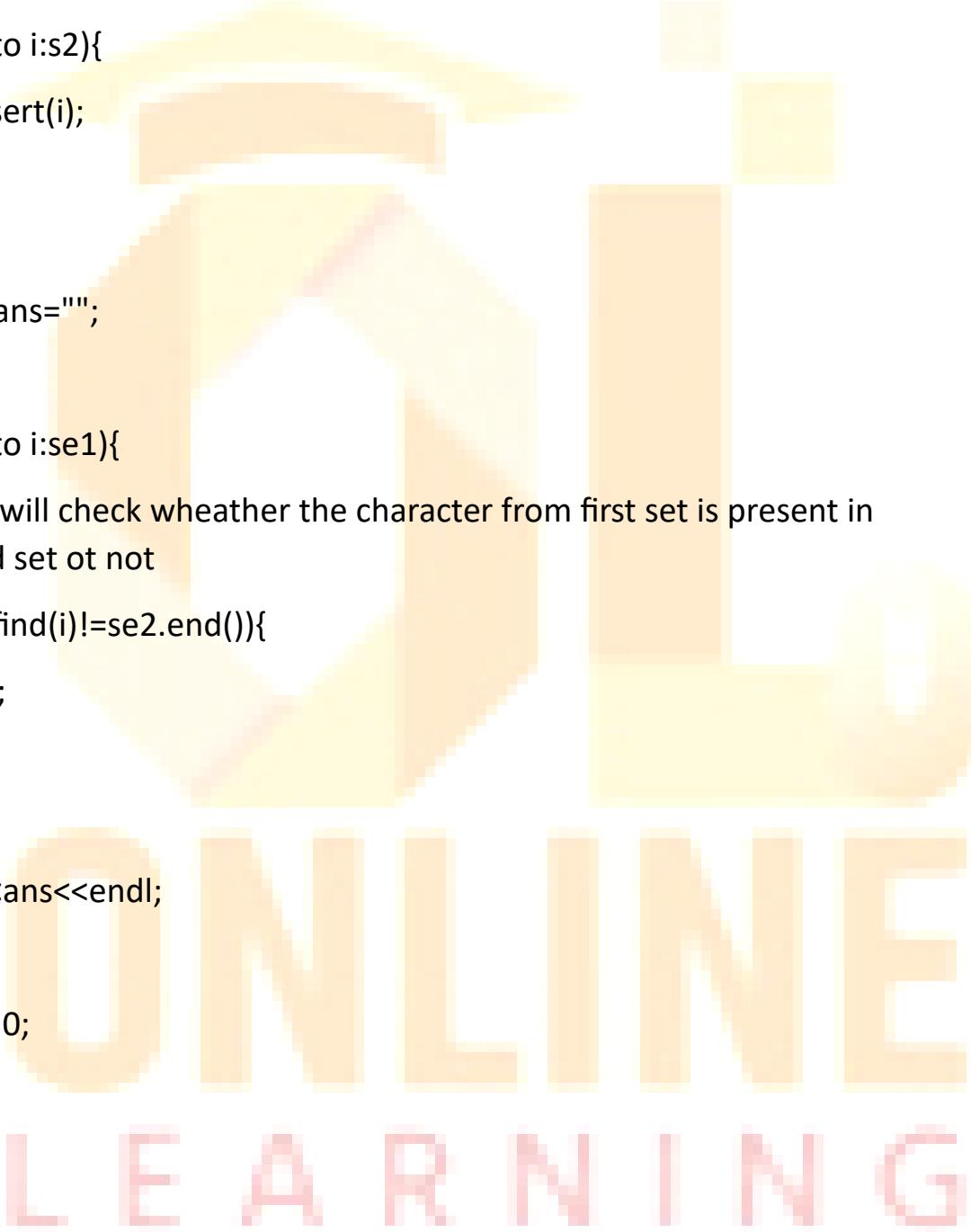
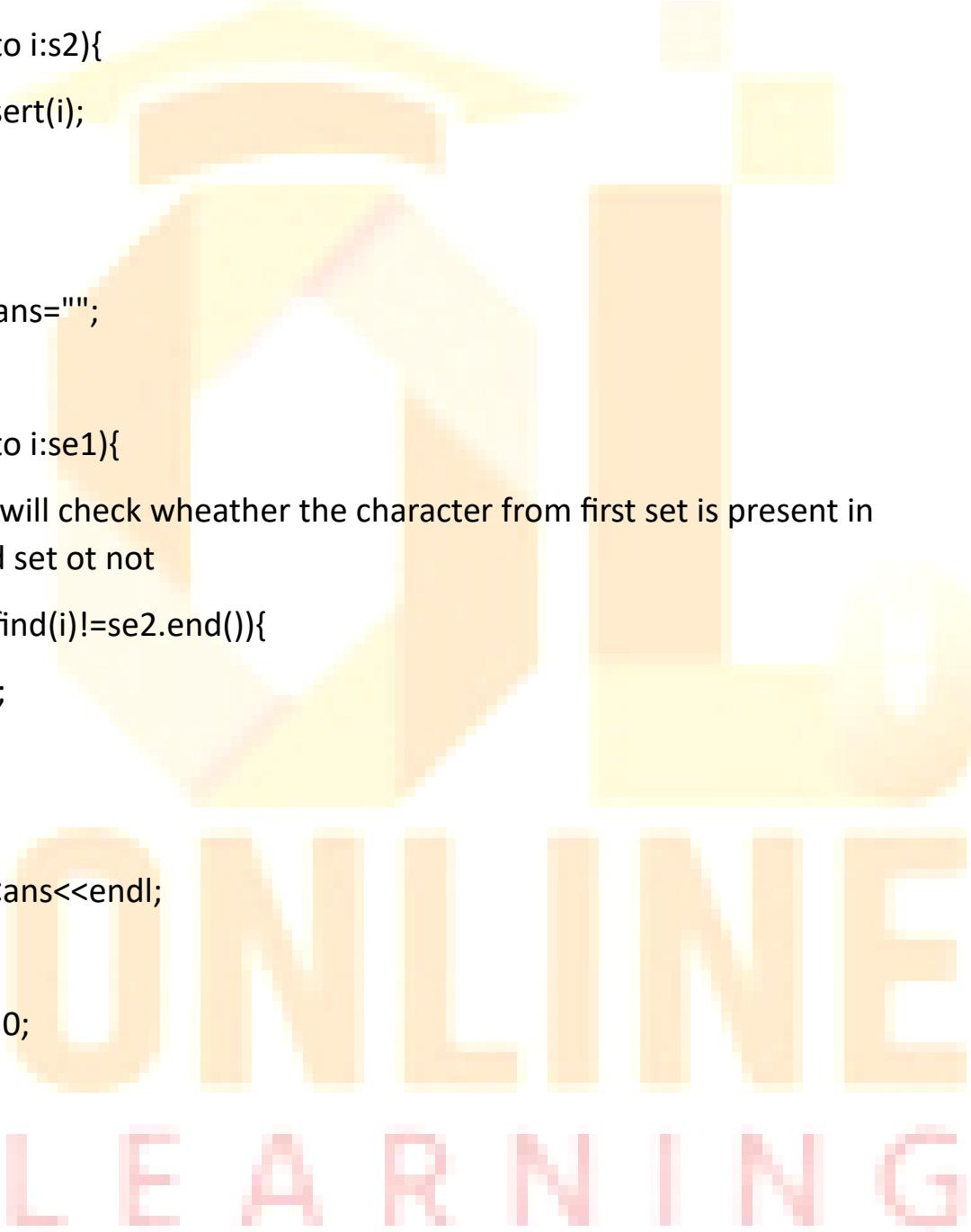
Q2.

A safety and security services agency communicates to its employees only in secret messages in case of emergency. The employee sends the message with a secret code(key). Here, the code will be the same combination of characters in both the messages(strings) sent. The task is to find the combination of letters(key) that is present on both the strings.(NQT off campus 2023)

C++:

```
#include<bits/stdc++.h>  
using namespace std;  
  
int main(){  
    string s1,s2;  
    cin>>s1>>s2;
```

```
set<char>se1,se2;  
for(auto i:s1){  
    se1.insert(i);  
}  
for(auto i:s2){  
    se2.insert(i);  
}  
  
string ans="";  
  
for(auto i:se1){  
    // this will check wheather the character from first set is present in  
    // second set or not  
    if(se2.find(i)!=se2.end()){  
        ans+=i;  
    }  
}  
cout<<ans<<endl;  
return 0;  
}
```



Java

```
import java.util.HashSet;
import java.util.Scanner;
import java.util.Set;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String s1 = scanner.next();
        String s2 = scanner.next();
        Set<Character> se1 = new HashSet<>();
        Set<Character> se2 = new HashSet<>();
        for (char c : s1.toCharArray()) {
            se1.add(c);
        }
        for (char c : s2.toCharArray()) {
            se2.add(c);
        }
        StringBuilder ans = new StringBuilder();
        for (char c : se1) {
            if (se2.contains(c)) {
                ans.append(c);
            }
        }
        System.out.println(ans);
```

```
}
```

```
}
```

Python

```
s1 = input()  
s2 = input()  
se1 = set(s1)  
se2 = set(s2)  
ans = ""  
for c in se1:  
    if c in se2:  
        ans += c  
print(ans)
```

📍 TCS Coding Questions | Live Session- 9

Video Link:

https://www.youtube.com/live/e1UuzmNsD2E?si=49A2Ecci_cC9Y9p9

ONLINE
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Q1.

Coding Question

- Bastin once had trouble finding the numbers in a string. The numbers are distributed in a string across various test cases. There are various numbers in each test case. You need to find the number in each test case. Each test case has various numbers in sequence. You need to find only those numbers which do not contain 9. For example, if the string contains "hello this is alpha 5051 and 9475". You will extract 5051 and not 9475. You need only those numbers which are consecutive and you need to help him find the numbers. Print the largest number.(NQT off campus 2023)

Python

```
S = input()
lst = S.split(" ")
fin = []
for i in lst:
    f = True
    for j in i:
        if j >= '0' and j <= '9':
            continue
        else:
            f = False
            break
    if f:
        if '9' not in i:
            fin.append(int(i))
print(max(fin))
```

C++

```
#include <iostream>
#include <sstream>
#include <vector>
using namespace std;
int main() {
    string S;
    getline(cin, S);
    stringstream ss(S);
    string token;
    vector<int> fin;
    while (ss >> token) {
        bool f = true;
        for (char j : token) {
            if (j
```

Java

```
import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
```

```
String S = scanner.nextLine();
String[] lst = S.split(" ");
List<Integer> fin = new ArrayList<>();
for (String i : lst) {
    boolean f = true;
    for (char j : i.toCharArray()) {
        if (j >= '0' && j <= '9') {
            continue;
        } else {
            f = false;
            break;
        }
    }
    if (f && !i.contains("9")) {
        fin.add(Integer.parseInt(i));
    }
}
if (!fin.isEmpty()) {
    int maxNum = fin.stream().mapToInt(Integer::intValue).max().getAsInt();
    System.out.println(maxNum);
}
}
```

LEARNING

Q2.

Given a string S(input consisting) of " " and "#". The length of the string is variable. The task is to find the minimum number of or '#' to make it a valid string. The string is considered valid if the number of " " and '#' are equal. The " " and '#' can be at any position in the string.(NQT off campus 2023)

Note: The output will be a positive or negative integer based on number of and '#' in the input string.

(*>#): positive integer

(#>*): negative integer

(**): 0

Example 1:



Input 1:

#####-> Value of S

Output:

0 number of and # are equal

Python:

```
S=input()  
count_of_hash=0  
count_of_star=0  
for i in S:  
    if i=='#':  
        count_of_hash+=1  
    else:  
        count_of_star+=1  
  
    if count_of_star>count_of_hash:  
        print(count_of_star-count_of_hash)  
    elif count_of_hash>count_of_star:  
        print(count_of_star-count_of_hash)  
    else:  
        print(0)
```

C++

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string S;
    getline(cin, S);
    int count_of_hash = 0, count_of_star = 0;
    for (char i : S) {
        if (i == '#') {
            count_of_hash++;
        } else {
            count_of_star++;
        }
    }
    if (count_of_star > count_of_hash) {
        cout << count_of_star;
    }
}
```

Java

```
import java.util.Scanner;
public class Main {
```

```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    String S = scanner.nextLine();  
    int count_of_hash = 0, count_of_star = 0;  
    for (char i : S.toCharArray()) {  
        if (i == '#') {  
            count_of_hash++;  
        } else {  
            count_of_star++;  
        }  
    }  
    if (count_of_star > count_of_hash) {  
        System.out.println(count_of_star - count_of_hash);  
    } else if (count_of_hash > count_of_star) {  
        System.out.println(count_of_hash - count_of_star);  
    } else {  
        System.out.println(0);  
    }  
}
```

ONLINE

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💡 TCS Coding Questions | Live Session- 11

Video Link: <https://www.youtube.com/live/K0nAcldVXXc?si=i1j-DvZor8iSci3Q>

Solutions: https://drive.google.com/file/d/1fDa2cGku5iRxDSxF_nUH96OIbn3ZBNT/view

💡 TCS Coding Questions | Live Session- 12

Video Link: <https://www.youtube.com/live/T5FlsQ-xNH4?si=RJL0glf4Pt6yJ3nx>

Solutions:

<https://drive.google.com/file/d/10zir4BuJcGfZ3VMgsJMxMzYSjhoiJagk/view>

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💡 TCS Coding Questions | Live Session- 13

Video Link: <https://www.youtube.com/watch?v=wkBWGuUPDZg&t=6s>

Coding:

Q1. There are a total number of Monkeys sitting on the branches of a huge Tree. As travelers offer Bananas and Peanuts, the Monkeys jump down the Tree. If every Monkey can eat k Bananas and j Peanuts. If Total m number of Bananas and p number of Peanuts offered by Travelers, calculate how many Monkeys remain on the Tree after some of them jumped down to eat.

At a time, one Monkey gets down and finishes eating and goes to the other side of the road. The Monkey who climbed down does not climb up again after eating until the other Monkeys finish eating. Monkeys can either eat k Bananas or j Peanuts. If for the last Monkey there are less than k Bananas left on the ground or less than j Peanuts left on the ground, only that Monkey can eat Bananas ($< k$) along with the Peanuts ($< j$).

Write the code to take inputs as n, m, p, k, j and return the number of Monkeys left on the Tree.

Where, n = Total number of Monkeys

k = Number of eatable Bananas by a single Monkey (Monkey that jumped down last may get less than k Bananas)

j = Number of eatable Peanuts by a single Monkey (Monkey that jumped down last may get less than Bananas)

m = Total number of Bananas

p = Total number of Peanuts

Remember that the Monkeys always eat Bananas and Peanuts, so there is no possibility of k and j having a value zero.

Example 1:

Input Values

20
2
3
12
12

Output Values

Number of Monkeys left on the Tree: 10

Note: Kindly follow the order of inputs as n, k, j, m, p as given in above example. And output must include the same format as in above example(Number of Monkeys left on the Tree:<Integer>)

For any wrong input display INVALID INPUT

C++

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int n,k,j,m,p;
    cin>>n>>k>>j>>m>>p;
    int ans=0;
    int eaten_bananas=m/k;
    int eaten_peanuts=p/j;
```

```
int total_eaten=eaten_peanuts+eaten_bananas;  
  
ans=n-total_eaten;  
cout<<ans<<endl;  
  
return 0;  
}
```

Java

```
import java.util.Scanner;  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        int n = scanner.nextInt();  
        int k = scanner.nextInt();  
        int j = scanner.nextInt();  
        int m = scanner.nextInt();  
        int p = scanner.nextInt();  
  
        int eaten_bananas = m / k;  
        int eaten_peanuts = p / j;  
  
        int total_eaten = eaten_bananas + eaten_peanuts;  
  
        int ans = n - total_eaten;  
  
        System.out.println(ans);  
    }  
}
```

Python

```
n, k, j, m, p = map(int, input().split())  
  
eaten_bananas = m // k  
eaten_peanuts = p // j  
  
total_eaten = eaten_bananas + eaten_peanuts  
  
ans = n - total_eaten  
  
print(ans)
```

Q2.

Given an array arr[] of N integers, the task is to replace the element with its frequency

Let say the array is arr=[1,2,2,6]

Frequency of 1=1 Frequency of 2=2 and Frequency of 6 =1

So the final answer is [1,2,2,1]

Python

```
N=4  
arr=[1,2,2,6]
```

```
d={}
```

```
for i in arr:  
    if i not in d:  
        d[i]=1  
    else:  
        d[i]+=1
```

```
for i in range(N):  
    arr[i]=d[arr[i]]
```

```
print(arr)
```

C++

```
#include <iostream>  
#include <vector>  
#include <unordered_map>
```

```
int main() {
    int N = 4;
    std::vector<int> arr = {1, 2, 2, 6};
    std::unordered_map<int, int> d;

    for (int i : arr) {
        if (d.find(i) == d.end())
            d[i] = 1;
        else
            d[i]++;
    }

    for (int i = 0; i < N; ++i) {
        arr[i] = d[arr[i]];
    }

    for (int num : arr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    return 0;
}
```

Java

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        int N = 4;
        int[] arr = {1, 2, 2, 6};
        Map<Integer, Integer> d = new HashMap<>();

        for (int i : arr) {
            d.put(i, d.getOrDefault(i, 0) + 1);
        }

        for (int i = 0; i < N; ++i) {
            arr[i] = d.get(arr[i]);
        }

        for (int num : arr) {
            System.out.print(num + " ");
        }
        System.out.println();
    }
}
```

💡 TCS Coding Questions | Live Session- 14

Video Link: <https://www.youtube.com/watch?v=plvUxeiVwac&t=5s>

Q2. Chain Marketing Sales Organization has a scheme for income generation through which its members generate income for themselves. The scheme is such that suppose A joins the scheme and makes Rand V to join this scheme then A is Parent Member of R and V who are child Members. When any member joins the scheme then the parent gets a total commission of 10% from each of its child members.

Child members receive commission of 5% respectively.

If a Parent member does not have any member joined under him, then he/she gets commission of 5%.

Take the Name of the Members Joining the Scheme as input.

Display how many members joined the scheme including parent members, Calculate the Total commission gained by each member in the scheme. The fixed amount for joining the scheme is Rs.5000 on which commission will be generated.

Scheme Amount=5000

Example 1: When there are more than one child members

Input: (Do not give Input Prompts. Accept values as follows.)

```
Amit          //Enter Parent Member Name as this
Y             //Enter Y if Parent Member have child members otherwise enter N
Rajesh, Virat //Enter Name of child members of Amit in comma separated
```

Output: (Final output must be in format given below.)

```
TOTAL MEMBERS: 3
COMMISSION DETAILS
Amit: 1000 INR
Rajesh: 250 INR
Virat: 250INR
```

Example 2: When there is only one child member in the hierarchy

Input:

```
Amit
Y
Rajesh
Output:
TOTAL MEMBERS: 2
COMMISSION DETAILS
Amit: 500 INR
Rajesh: 250 INR
```

Python

```
parent=input()
childz=input()

if childz=='Y':
    list_of_child=list(map(str,input().split(',')))

parent_commission=len(list_of_child)*0.1*5000
child_commission=0.05*5000
```

```
print("parent commision is",parent_commission)
print("child commision is",child_commission)

else:

    print("Parent commision is ",5000*0.05)
```

C++

```
#include <iostream>
#include <vector>
#include <sstream>

int main() {
    std::string parent, childList;
    std::getline(std::cin, parent);
    std::getline(std::cin, childList);

    if (childList == "Y") {
        std::string child;
        std::stringstream ss(childList);
        std::vector<std::string> list_of_child;
        while (std::getline(ss, child, ',')) {
            list_of_child.push_back(child);
        }

        double parent_commission = list_of_child.size() * 0.1 * 5000;
        double child_commission = 0.05 * 5000;

        std::cout << "Parent commision is " << parent_commission << std::endl;
        std::cout << "Child commision is " << child_commission << std::endl;
    } else {
        std::cout << "Parent commision is " << 5000 * 0.05 << std::endl;
    }

    return 0;
}
```

Java

```
import java.util.Scanner;
```

```

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String parent = scanner.nextLine();
        String child = scanner.nextLine();

        if (child.equals("Y")) {
            String childList = scanner.nextLine();
            String[] list_of_child = childList.split(",");
            double parent_commission = list_of_child.length * 0.1 * 5000;
            double child_commission = 0.05 * 5000;

            System.out.println("Parent commission is " + parent_commission);
            System.out.println("Child commission is " + child_commission);
        } else {
            System.out.println("Parent commission is " + 5000 * 0.05);
        }
    }
}

```

Q2.

Given a string convert the characters of the string into the opposite case

i.e if a character is the lower case then convert it into upper case and vice versa.

Example

I

Input

geeksForGeeks

Output

GEEKSfORGeEKS

C++

```

// CPP program to Convert characters
// of a string to opposite case
#include <iostream>
using namespace std;

// Function to convert characters
// of a string to opposite case
void convertOpposite(string& str)
{
    int ln = str.length();

```

```
// Conversion according to ASCII values
for (int i = 0; i < ln; i++) {
    if (str[i] >= 'a' && str[i] <= 'z')
        // Convert lowercase to uppercase
        str[i] = str[i] - 32;
    else if (str[i] >= 'A' && str[i] <= 'Z')
        // Convert uppercase to lowercase
        str[i] = str[i] + 32;
}
}

// Driver function
int main()
{
    string str = "GeEkSfOrGeEkS";

    // Calling the Function
    convertOpposite(str);

    cout << str;
    return 0;
}
```

Java

```
// Java program to Convert characters
// of a string to opposite case
class Test {

    // Method to convert characters
    // of a string to opposite case
    static void convertOpposite(StringBuffer str)
    {
        int ln = str.length();

        // Conversion using predefined methods
        for (int i = 0; i < ln; i++) {
            Character c = str.charAt(i);
            if (Character.isLowerCase(c))
                str.replace(i, i + 1,
                            Character.toUpperCase(c) + "");
            else
                str.replace(i, i + 1,
                            Character.toLowerCase(c) + "");
        }
    }

    public static void main(String[] args)
    {
        StringBuffer str
            = new StringBuffer("GeEkSfOrGeEkS");
        // Calling the Method
    }
}
```

```
        convertOpposite(str);

        System.out.println(str);
    }
}
```

Python

```
# Python3 program to Convert characters
# of a string to opposite case

# Function to convert characters
# of a string to opposite case
def convertOpposite(str):
    ln = len(str)

    # Conversion according to ASCII values
    for i in range(ln):
        if str[i] >= 'a' and str[i] <= 'z':

            # Convert lowercase to uppercase
            str[i] = chr(ord(str[i]) - 32)

        elif str[i] >= 'A' and str[i] <= 'Z':

            # Convert lowercase to uppercase
            str[i] = chr(ord(str[i]) + 32)

    # Driver code
if __name__ == "__main__":
    str = "GeEkSfOrGeEkS"
    str = list(str)

    # Calling the Function
    convertOpposite(str)

    str = ''.join(str)
    print(str)
```

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