**Programs for Campus**

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# **Questions**

Q1) WAP to reverse a given string?

#include <bits/stdc++.h>

using namespace std;

void reverseString(string &s){

    string temp="";

    for(int i=s.length();i>=0;i--){

        temp.push\_back(s[i]);

    }

    s=temp;

}

int main(){

    string s;

    getline(cin,s);

    // reverse(s.begin(),s.end());

    reverseString(s);

    cout<<s;

    return 0;

}

Q2) WAP to check the given string is a palindrome or not?

#include<bits/stdc++.h>

using namespace std;

int main()

{

    string str;

    getline(cin,str);

    string temp=str;

    reverse(temp.begin(),temp.end());

    if(temp==str){

        cout<<"YES";

    }

    else{

        cout<<"NO";

    };

    return 0;

}

Q3) WAP to reverse a given no?

#include<bits/stdc++.h>

using namespace std;

typedef long long ll;

int main(){

    ll n,reverse=0,rem;

    cin>>n;

    while (n!=0)

    {

        rem=n%10;

        reverse=reverse\*10+rem;

        n/=10;

    }

    cout<<reverse;

    return 0;

}

Q4) WAP to generate first n Fibonacci no?

#include<bits/stdc++.h>

using namespace std;

void PrintVector(int v[],int n)

{

    for (int i = 0; i < n; i++)

    {

        cout << v[i] << " ";

    }

}

int main(){

    int n;

    cin>>n;

    int ans[n];

    ans[0]=0;

    ans[1]=1;

    for(int i=2;i<n;i++){

        ans[i]=ans[i-1]+ans[i-2];

    }

    PrintVector(ans,n);

    return 0;

}

Q5) WAP to find factorial of a no?

#include<bits/stdc++.h>

using namespace std;

int fact(int n){

    if(n==1 || n==0){

        return 1;

    }

    int i,ans=1;

    for(i=n;i>0;i--){

        ans\*=i;

    }

    return ans;

}

int main(){

    int n;

    cin>>n;

    cout<<fact(n);

    return 0;

}

Q6) WAP to find factorial of a no using recursion?

#include<bits/stdc++.h>

using namespace std;

int fact(int n){

    if(n==1 || n==0){

        return 1;

    }

    return n\*fact(n-1);

}

int main(){

    int n;

    cin>>n;

    cout<<fact(n);

    return 0;

}

Q7) WAP to generate first n Fibonacci no using recursion?

#include<bits/stdc++.h>

using namespace std;

int fibo(int n){

    if(n==0){

        return 0;

    }

    else if(n==1){

        return 1;

    };

    return fibo(n-1)+fibo(n-2);

};

int main(){

    int n;

    cin>>n;

    for(int i=0;i<n;i++){

        cout<<fibo(i)<<" ";

    }

    return 0;

}

Q8) WAP to find GCD of an integer using recursion?

#include<bits/stdc++.h>

using namespace std;

int gcd(int a,int b){

    if(a==0){

        return b;

    }

    else if(b==0){

        return a;

    }

    else if(a==b){

        return a;

    }

    if(a>b){

        return gcd(a-b,b);

    };

    return gcd(a,b-a);

}

int main(){

    int a,b;

    cin>>a;

    cin>>b;

    cout<<gcd(a,b);

}

Q9) WAP to check is a no is a prime no or not?

#include<bits/stdc++.h>

using namespace std;

int main(){

    int n;

    cin>>n;

    if(n<=1){

        cout<<"NO";

    }

    else{

        bool flag=true;

        for(int i=2;i<=n/2;i++){

            if(n%i==0){

                cout<<"NO";

                flag=false;

                break;

            }

        }

        if(flag)

            cout<<"YES";

    }

    return 0;

}

Q10) WAP to interchange two integer values using call by value technique?

#include<bits/stdc++.h>

using namespace std;

void sWAP(int a,int b){

    int temp;

    temp=a;

    a=b;

    b=temp;

    cout<<"a="<<a<<endl<<"b="<<b;

}

int main(){

    int a,b;

    cin>>a>>b;

    sWAP(a,b);

    return 0;

}

Q11) WAP to interchange two integer values using call by value reference?

#include<bits/stdc++.h>

using namespace std;

void sWAP(int\* a,int\* b){

    int temp;

    temp=\*a;

    \*a=\*b;

    \*b=temp;

    cout<<"a="<<\*a<<endl<<"b="<<\*b;

}

int main(){

    int a,b;

    cin>>a>>b;

    sWAP(&a,&b);

    return 0;

}

Q12) WAP to find power(a , b) using recursion ?

#include<bits/stdc++.h>

using namespace std;

int power(int a,int b){

    if(b==1){

        return a;

    }

    return a\*power(a,b-1);

}

int main(){

    int a,b;

    cin>>a>>b;

    cout<<power(a,b);

    return 1;

}

Q13) WAP to print the following pyramid?

#include <bits/stdc++.h>

using namespace std;

void p1(int n)

{

    int rowLength = n \* 2 - 1;

    for (int i = 1; i <= n; i++)

    {

        int dashSize = (rowLength - (2 \* i - 1)) / 2;

        for (int j = 0; j < dashSize; j++)

        {

            cout << " ";

        }

        for (int k = 0; k < i; k++)

        {

            cout << i << " ";

        }

        for (int l = 0; l < dashSize - 1; l++)

        {

            cout << " ";

        }

        cout << endl;

    }

}

void p2(int n){

     int no=1,rowLength = n \* 2 - 1;

    for (int i = 1; i <= n; i++)

    {

        int dashSize = (rowLength - (2 \* i - 1)) / 2;

        for (int j = 0; j < dashSize; j++)

        {

            cout << " ";

        }

        for (int k = 0; k < i; k++)

        {

            cout <<no<<" ";

            no++;

        }

        for (int l = 0; l < dashSize - 1; l++)

        {

            cout << " ";

        }

        cout << endl;

    }

}

void p3(int n){

    int rowLength = n \* 2 - 1;

    for (int i = 1; i <= n; i++)

    {

        int dashSize = (rowLength - (2 \* i - 1)) / 2;

        for (int j = 0; j < dashSize; j++)

        {

            cout << " ";

        }

        for (int k = 0; k < i; k++)

        {

            cout <<"\* ";

        }

        for (int l = 0; l < dashSize - 1; l++)

        {

            cout << " ";

        }

        cout << endl;

    }

}

int main()

{

    int n;

    cin >> n;

    p1(n);

    cout<<endl<<endl;

    p2(n);

    cout<<endl<<endl;

    p3(n);

    return 0;

}

Q14) WAP to find GCD of given 2 no’s?

#include<bits/stdc++.h>

using namespace std;

int main(){

    int a,b;

    cin>>a>>b;

    while (a!=b)

    {

        if(a>b){

            a=a-b;

        }

        else{

            b=b-a;

        }

    }

    cout<<a;

    return 0;

}

Q15) Write a program that uses functions to perform the following operations:

1. To insert a sub-string in to given main string from a given position.

#include<bits/stdc++.h>

using namespace std;

int main(){

    int pos;

    string mainString,subString;

    getline(cin,mainString);

    getline(cin,subString);

    cin>>pos;

    mainString.insert(mainString.end()-(mainString.size()-pos+1),subString.begin(),subString.end());

    cout<<mainString;

    return 1;

}

1. To delete n Characters from a given position in a given string.

#include<bits/stdc++.h>

using namespace std;

int main(){

    int pos;

    string mainString;

    getline(cin,mainString);

    cin>>pos;

    mainString.erase(mainString.end()-(mainString.size()-pos+1),mainString.end());

    cout<<mainString;

    return 1;

}

1. To replace a character of string either from beginning or ending or at a specified location.

#include<bits/stdc++.h>

using namespace std;

int main(){

    int pos;

    string mainString;

    char newChar;

    getline(cin,mainString);

    cin>>newChar;

    cin>>pos;

    mainString[(pos-1)]=newChar;

    cout<<mainString;

    return 1;

}

Q16) Write a program to sWAP two values without using temporary variable?

#include<bits/stdc++.h>

using namespace std;

void sWAP(int a,int b){

    a=a+b;

    b=a-b;

    a=a-b;

    cout<<"a="<<a<<endl<<"b="<<b;

}

int main(){

    int a,b;

    cin>>a>>b;

    sWAP(a,b);

    return 0;

}

Q17) Write a program to check the given year is leap year or not?

#include<bits/stdc++.h>

using namespace std;

int main(){

    int year;

    cin>>year;

    if(year%400==0){

        cout<<"YES";

    }

    else if(year%100==0){

        cout<<"NO";

    }

    else if(year%4==0){

        cout<<"YES";

    }

    else{

        cout<<"NO";

    }

    return 1;

}

Q18) WAP to implement linear search using recursion.

#include <bits/stdc++.h>

using namespace std;

int linearSearch(int arr[], int pos, int n, int x)

{

    if (arr[pos] == x)

    {

        return pos;

    }

    else if (pos == n)

    {

        return -1;

    }

    return linearSearch(arr, pos + 1, n, x);

}

int main()

{

    int n;

    cin >> n;

    cout << endl;

    int no, arr[n], ans;

    for (int i = 0; i < n; i++)

    {

        cin >> arr[i];

    }

    cout << endl;

    cin >> no;

    ans = linearSearch(arr, 0, n - 1,no);

    if(ans!=-1){

        cout<<"No at index "<<ans;

    }

    else{

        cout<<"No not there";

    }

    return 1;

}

Q19) WAP implement linear search without using recursion.

#include <bits/stdc++.h>

using namespace std;

int linearSearch(int arr[],int n,int no){

    for(int i=0;i<n;i++){

        if(arr[i]==no){

            return i;

        }

    }

    return -1;

}

int main()

{

    int n;

    cin >> n;

    cout << endl;

    int no, arr[n], ans;

    for (int i = 0; i < n; i++)

    {

        cin >> arr[i];

    }

    cout << endl;

    cin >> no;

    ans = linearSearch(arr,n,no);

    if(ans!=-1){

        cout<<"No at index "<<ans;

    }

    else{

        cout<<"No not there";

    }

    return 1;

}

Q20) WAP to implement Binary search using recursion.

Q21) WAP implement Binary search without using recursion. Q22) Write a function to sort 1d integer array using Bubble sort.

Q23) Write a function to sort 1d integer array using Selection sort.

Q24) Write a function to sort 1d integer array using Insertion sort.

Q25) Write a function to sort 1d integer array using Merge sort.

Q26)Write a program to find both the largest and smallest number of an array of integers.

#include<bits/stdc++.h>

using namespace std;

int main(){

    int n;

    cin >> n;

    cout << endl;

    int arr[n],max=INT\_MIN,min=INT\_MAX;

    for (int i = 0; i < n; i++)

    {

        cin >> arr[i];

    }

    cout << endl;

    for(int i=0;i<n;i++){

        if(arr[i]>max){

            max=arr[i];

        }

        if(arr[i]<min){

            min=arr[i];

        }

    }

    cout<<"MAX: "<<max<<endl;

    cout<<"MIN: "<<min;

    return 1;

}

Q27) Write a program to find the smallest and largest element in a two dimensional array.

#include <bits/stdc++.h>

using namespace std;

int main()

{

    int n, m;

    cin >> n >> m;

    cout << endl;

    int arr[n][m], max = INT\_MIN, min = INT\_MAX;

    for (int i = 0; i < n; i++)

    {

        for (int j = 0; j < m; j++)

        {

            cin >> arr[i][j];

        }

        cout<<endl;

    }

    cout << endl<<endl;

    for (int i = 0; i < n; i++)

    {

        for (int j = 0; j < m; j++)

        {

            if (arr[i][j] > max)

            {

                max = arr[i][j];

            }

            if (arr[i][j] < min)

            {

                min = arr[i][j];

            }

        }

    }

    cout << "MAX: " << max << endl;

    cout << "MIN: " << min;

    return 1;

}

Q28) Write a C function to generate Pascal's triangle.

Q29) Write a function to convert a string into its opposite case.

Q30) Write a program to print the grade of the student as follows:

If m>=60 print grade as FIRST

If m>=50 and m<60 print grade as SECOND

If m>=40 and m<50 print grade as THIRD

If m<40 print grade as FAILED

#include<bits/stdc++.h>

using namespace std;

int main(){

    int grade;

    cin>>grade;

    if(grade<40){

        cout<<"FAILED";

    }

    else if(grade>=40 && grade<50){

        cout<<"THIRD";

    }

    else if(grade>=50 && grade<60){

        cout<<"SECOND";

    }

    else{

        cout<<"FIRST";

    }

    return 1;

}

Q31) Write a C program to find the sum of individual digits of a positive integer.

Q32) WAP for Matrix multiplication by checking compatibility. Q33) Write a function which takes 1d integer array as an argument and return the maximum value.

Q34) Write a function which takes a matrix as an argument and return its transpose.

Q35) Write a program to copy the string into another string using pointers.

Q36) Write a function which takes a string as an argument and return its length.(using pointers).

Q37) Write a program to find 1+1/2+1/3+1/4…. Value.

Q38) WAP to find NCr value.

Q39) Write a program to calculate mn value using do-while loop.

Q40) Write a program to check whether the given number is an Amstrong number or not.

Q41) Write a program to check whether the two strings are identical or not.

Q42) WAP to sort the characters in a given string.

Q43) WAP to check the given matrix is symmetric or not. Q44) Write a program to illustrate usage of automatic, global, extern, static and register variables.

Q45) Write a program to find the sum of 1 d integer array(using malloc( ) ).

Q46) Define a structure with the name complex which contains real part and imaginary part. write the functions to add, subtract and multiply two complex numbers using returning as an complex number.

Q47) Define a structure with the name student which contains sno, sname, marks. WAP to read and n students information and print the details of the students whose marks greater than or equal to average marks of the students.

Q49) Write a C program using structure to create a library catalogue with the following fields; Access number, author's name. Title of the book, year of publication, publisher's name, price.

Q50) Write a C program to compute the monthly pay of 100 employees using each employee's name, basic-pay. The DA is computed as 52% of the basic pay. Gross salary (Basic-pay+DA).Print the employees name and gross salary.

Q51) Write a function to compare two structure variables.

Q52) Write a function to copy the contents of one student into another student record Of same.

Q53) Write a program to illustrate unions.

Q54) Explaining pointer to a structure variable with example.

Q55) Write a program to copy the contents of one file into another file.

Q56) Write a program to count the number of words, lines and characters in the given file.

Q57) Write a program to print the data of the file onto the monitor in reverse order.

Q58) Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line).

Q59) Write a C program to open a pre-existing file and add information at the end of file. Display the contents of the file before and after appending.

# Extra Questions

Q1) Program to cyclically rotate an array by one?

#include <bits/stdc++.h>

using namespace std;

vector<int> SplitString(string s)

{

    vector<int> v;

    string temp = "";

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

    {

        if (s[i] == ' ')

        {

            if (temp.length() != 0)

            {

                v.push\_back(stoi(temp));

                temp="";

            }

        }

        else

        {

            temp.push\_back(s[i]);

        }

    }

    if(temp.length() != 0){

        v.push\_back(stoi(temp));

    }

    return v;

}

void PrintVector(vector<int> v)

{

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

    {

        cout << v[i] << " ";

    }

}

int main()

{

    string inputString;

    getline(cin,inputString);

    vector<int> arr=SplitString(inputString);

    vector<int> ans={arr[arr.size()-1]};

    vector<int> splitedVector(arr.begin(),arr.end()-1);

    ans.insert(ans.end(),splitedVector.begin(),splitedVector.end());

    PrintVector(ans);

    return 0;

}

Q2) Given an array of integer and a no ‘sum’ find the no of pairs of integers in the array whose sum is equal to ‘sum’?

#include <bits/stdc++.h>

using namespace std;

vector<int> SplitString(string s)

{

    vector<int> v;

    string temp = "";

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

    {

        if (s[i] == ' ')

        {

            if (temp.length() != 0)

            {

                v.push\_back(stoi(temp));

                temp = "";

            }

        }

        else

        {

            temp.push\_back(s[i]);

        }

    }

    if (temp.length() != 0)

    {

        v.push\_back(stoi(temp));

    }

    return v;

}

void PrintVector(vector<int> v)

{

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

    {

        cout << v[i] << " ";

    }

}

int findPairs(vector<int> v,int n){

    int i,ans=0;

    for(i=0;i<v.size()-1;i++){

        for(int j=i+1;j<v.size();j++){

            if((v[i]+v[j])==n){

                ans+=1;

            }

        }

    }

    return ans;

}

int main()

{

    int n;

    cin>>n;

    cin.ignore(256, '\n');

    string inputString;

    getline(cin, inputString);

    vector<int> arr = SplitString(inputString);

    cout<<findPairs(arr,n);

}

Q2) Given an array of positive negative no, find if there is a subarray with sum 0?

#include <bits/stdc++.h>

using namespace std;

vector<int> SplitString(string s)

{

    vector<int> v;

    string temp = "";

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

    {

        if (s[i] == ' ')

        {

            if (temp.length() != 0)

            {

                v.push\_back(stoi(temp));

                temp = "";

            }

        }

        else

        {

            temp.push\_back(s[i]);

        }

    }

    if (temp.length() != 0)

    {

        v.push\_back(stoi(temp));

    }

    return v;

}

int main()

{

    string inputString;

    getline(cin, inputString);

    vector<int> arr = SplitString(inputString);

    int count=0;

    for(int i=0;i<arr.size()-1;i++){

        int sum=i;

        for(int j=i+1;j<arr.size();j++){

            if((sum+arr[j])==0){

                count+=1;

            };

            if(i==0 && arr[j]==0){

                count+=1;

            }

            sum+=arr[j];

        }

    }

    if(arr[arr.size()-1]==0){

        count+=1;

    }

    if(count==0){

        cout<<"false";

    }

    else{

cout<<count;

    }

    return 0;

}

Q3) Given an array of integers, find the length of the longest sub-sequence such that elements in subsequence are consecutive integers, the consecutive numbers can be in any order?

Q4) An array contains both positive and negative no in random order. Rearrange the array elements so that all negative number appears before all positive, no?

Q5) Given a sorted array your task is to remove the duplicate elements from the array?

#include<bits/stdc++.h>

using namespace std;

vector<int> SplitString(string s)

{

    vector<int> v;

    string temp = "";

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

    {

        if (s[i] == ' ')

        {

            if (temp.length() != 0)

            {

                v.push\_back(stoi(temp));

                temp="";

            }

        }

        else

        {

            temp.push\_back(s[i]);

        }

    }

    if(temp.length() != 0){

        v.push\_back(stoi(temp));

    }

    return v;

}

void PrintVector(vector<int> v)

{

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

    {

        cout << v[i] << " ";

    }

}

int main(){

    string inputStr;

    getline(cin,inputStr);

    vector<int> ans,arr=SplitString(inputStr);

    for(int i=0;i<arr.size();i++){

        if(find(ans.begin(),ans.end(),arr[i])!=ans.end()){

            continue;

        }

        else{

            ans.push\_back(arr[i]);

        }

    }

    PrintVector(ans);

    return 0;

}