Conceptual session week 3

Finding the largest value:

10, 5,7,1,2 array size 5;

Array elements 5 that’s are sample elements

Now question is 🡪 find the 3rd largest elements….

Answer sequence:

🡪 input array{ arr[i]=” ” ; }

🡪 find the largest elements from the array(largest numbe is 10) [10 7 5 2 1 ] arr[0]=10;

🡪 ( largest elements + 1 ) size er notun array nite hobe.

**0 0 0 0 0 0 0 0 0 0 0**



**0 1 2 3 4 5 6 7 8 9 10**



🡪 নতুন অ্যারে এর প্রত্যেক ইনডেক্স এর ভিতর 0 assign করতে হবে।

# 🡪 step 4: arr [ input [0] ]+ =1;

arr[10]+=1;

arr[10]=arr[0]+1;

=0+1;

🡪 প্রথম অ্যারে এর মধ্যে ইলিমেন্ট গুলা থাকবে সেগুলো গুলো চেক করে দ্বিতীয় অ্যারে এর ইনডেক্স গুলোকে 0 থেকে 1করে দিবে (প্রথম অ্যারে এর ইলিমেন্ট = দ্বিতীয় অ্যারে এর ইনডেক্স হিসেবে জমা থাকবে ) অর্থাৎ

🡪 ( largest elements + 1 ) size er notun array te:

**0 1 1 0 0 1 0 1 0 0 1**



**0 1 2 3 4 5 6 7 8 9 10**

🡪তারপর যখন ৩য় সর্বোচ্চ নম্বর বের করতে বলবে তখন রিভার্স লুপ এর মাধ্যমে if (i==1) হলে count+=1; করে বাড়তে থাকবে।

যখন count =3 হবে তখন ওই ঘরের ইনডেক্স নম্বর প্রিন্ট করে দিলেই হবে।।

যেমনঃ এখানে count =3 হলো ইনডেক্স নম্বর 5;

সতুরাং এখানে ৩য় সর্বোচ্চ নম্বর হলো 5।

Code

#include<stdio.h>

int main()

{

int n,i,j;

//step 1

printf("Declare array size :: ");

scanf("%d",&n);

int input[n];

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

{

scanf("%d",&input[i]);

// printf("%d ",input[i]);

}

//dhori input array er man gulu holo[10,7,5,2,1]

//step 2 : we find out the largest element ..

int largest =input[0];

for (i=1; i<n ; i++)

{

if ( input[i]>largest){

largest = input[i];

}

}

printf("the largest number is: %d ", largest);

//step 3:make an array same size of largest number and fill all index with 0;

printf("\n");

int arr[largest + 1];

for (i=0; i<=largest; i++)

{

arr[i]=0;

printf(" %d",arr[i]);

}

printf("\n");

//step 4:

for (i=0; i<n; i+=1)

{

arr[input[i]]+=1; //[10,7,5,2,1] //frist array er index er mangula bosbe; arr[innput[0]]=1,

// arr[i]+=1; // arr[10]+=1;

// arr[i]=arr[i]+1; // arr[10]=arr[10]+1;

}

printf("\n");

for (i=0; i<=largest; i+=1)

{

printf("%d ", arr[i]);

}

int count=0,position;

printf("\nWhich largest value you want to print: ");

scanf("%d", &position);

for (i=largest; i>=1;i-=1){

if (arr[i]==1){

count+=1;

}

if (count==position){

printf("The %dth largest value is : %d",position, i);

break;

}

}

return 0;

}

**Question 1 -**

Sample output when n = 5

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

**Solution -**

#include<stdio.h>

int main()

{

    int n,i,j;

    scanf("%d",&n);

    for(i=1; i<=n; i+=1)

    {

        for(j=i; j<=n; j+=1)

        {

            printf("\* ");

        }

        printf("\n");

    }

    return 0;

}

**Question 2 -**

>> Find the k-th largest element or k-th smallest element

**Solution -**

/\*

Steps -

1) Input niyachi n (array er size)

2) n size er array ta input niyachi

3) Oi array theke largest element ta find korte hbe er pore

4) arr[largestElement+1] size er akta array declare korechi

5) arr[largestElement+1] size er array er prottek ta index ee 0

assign kore dita hbe.

6) 0 theke n times akta loop chalaite hbe and every index eer jonno ai

 operation ta -> arr[input[i]]+=1; perform korsi

7) depends on problem statement

\*/

#include<stdio.h>

int main()

{

    int n,i;

    scanf("%d",&n);

    int input[n];

    for(i=0; i<n; i+=1)

    {

        scanf("%d",&input[i]);

    }

    int largestElement=input[0];

    for(i=1; i<n; i+=1)

    {

        if(input[i]>largestElement)

        {

            largestElement=input[i];

        }

    }

    int arr[largestElement+1];

    for(i=0; i<=largestElement; i+=1)

    {

        arr[i]=0;

    }

    for(i=0; i<n; i+=1)

    {

        arr[input[i]]+=1;

    }

    int cnt=0;

    for(i=largestElement; i>=1; i-=1)

    {

        if(arr[i]==1)

        {

            cnt++;

        }

        if(cnt==3)

        {

            printf("3rd largest element is %d\n",i);

            break;

        }

    }

    return 0;

}

**Question 3 -**

>> Find the duplicate or unique element from an array

**Solution -**

/\*

Steps -

1) Input niyachi n (array er size)

2) n size er array ta input niyachi

3) Oi array theke largest element ta find korte hbe er pore

4) arr[largestElement+1] size er akta array declare korechi

5) arr[largestElement+1] size er array er prottek ta index ee 0

assign kore dita hbe.

6) 0 theke n times akta loop chalaite hbe and every index eer jonno ai

 operation ta -> arr[input[i]]+=1; perform korsi

7) depends on problem statement

\*/

#include<stdio.h>

int main()

{

    int n,i;

    scanf("%d",&n);

    int input[n];

    for(i=0; i<n; i+=1)

    {

        scanf("%d",&input[i]);

    }

    int largestElement=input[0];

    for(i=1; i<n; i+=1)

    {

        if(input[i]>largestElement)

        {

            largestElement=input[i];

        }

    }

    int arr[largestElement+1];

    for(i=0; i<=largestElement; i+=1)

    {

        arr[i]=0;

    }

    for(i=0; i<n; i+=1)

    {

        arr[input[i]]+=1;

    }

    int duplicate=0,unique=0;

    for(i=1; i<=largestElement; i+=1)

    {

        if(arr[i]==1)

            unique+=1;

        else if(arr[i]>1)

            duplicate+=1;

    }

    printf("Total duplicate element found  %d\n",duplicate);

    printf("Total unique element found  %d\n",unique);

    return 0;

}

**Question 4 -**

Link - <https://codeforces.com/contest/1512/problem/A>

**Solution -**

#include<stdio.h>

int main()

{

    int t,ii;

    scanf("%d",&t);

    for(ii=1; ii<=t; ii+=1)

    {

        int n,i,maxN=101;

        scanf("%d",&n);

        int input[n+1];

        for(i=1; i<=n; i+=1)

        {

            scanf("%d",&input[i]);

        }

        int arr[maxN];

        for(i=0; i<maxN; i+=1)

        {

            arr[i]=0;

        }

        for(i=1; i<=n; i+=1)

        {

            arr[input[i]]+=1;

        }

        int index;

        for(i=1; i<=n; i+=1)

        {

            if(arr[input[i]]==1)

            {

                index=i;

                break;

            }

        }

        printf("%d\n",index);

    }

    return 0;

}