//PROBLEM 1(WEEK 2) **(OCCURRENCE)**

#include<iostream>

using namespace std;

int Binary\_search\_Firstoccur(int arr[], int n, int key)

{

int res = 0;

int low = 0, high = n-1;

while(low <= high)

{

int mid = low+(high-low)/2;

if(key == arr[mid])

{

res = mid;

high = mid-1;

}

else if(key > arr[mid])

low = mid+1;

else

high = mid-1;

}

return res;

}

int Binary\_search\_Lastoccur(int arr[], int n, int key)

{

int flag = 0;

int low = 0, high = n-1;

int res = 0;

while(low <= high)

{

int mid = low+(high-low)/2;

if(key == arr[mid])

{

flag = 1;

res = mid;

low = mid+1;

}

else if(key > arr[mid])

low = mid+1;

else

high = mid-1;

}

if(flag == 0)

return -1;

return res;

}

int main()

{

int t;

cout<<"Enter the number of test cases: ";

cin>>t;

while(t--)

{

int n;

cout<<"Enter the size of array: ";

cin>>n;

int arr[n];

cout<<"Enter the elements of array: ";

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

cin>>arr[i];

int key;

cout<<"Enter the key: ";

cin>>key;

int first = Binary\_search\_Firstoccur(arr, n, key);

int last = Binary\_search\_Lastoccur(arr, n, key);

if(last!=-1)

cout<<key<<"-"<<last-first+1<<endl;

else

cout<<"Key not present"<<endl;

}

}

***OUTPUT:***

Enter the number of test cases: 2

Enter the size of array: 5

Enter the elements of array: 35 67 89 90

98

Enter the key: 6

Key not present

Enter the size of array: 4

Enter the elements of array: 35 67 90 99

Enter the key: 67

67-1

//PROBLEM 2(WEEK 2) **(TRIPLETS FINDING)**

#include<stdio.h>

#define MAX 100

int main()

{

int flag = 0;

int t, A[MAX], n;

printf("Enter the number of test cases: ");

scanf("%d",&t);

while(t)

{

int i = 0, j = 0, k = 0;

printf("Enter the size of the array: ");

scanf("%d",&n);

printf("Enter the elements of array: ");

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

{

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

}

for(i = 0; i < n-2; i++)

{

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

{

for(k = j+1; k < n; k++)

{

if(A[i]+A[j] == A[k])

{

printf("\nIndices :%d\t%d\t%d",i, j, k);

flag = 1;

break;

}

}

}

}

t = t-1;

}

if(flag == 0)

{

printf("No sequence found");

}

return 0;

}

***OUTPUT:***

Enter the number of test cases: 1

Enter the size of the array: 5

Enter the elements of array: 1 2 3 4 5

Indices :0 1 2

Indices :0 2 3

Indices :0 3 4

Indices :1 2 4

//PROBLEM 3(WEEK 2) **(DIFFERENCE EQUAL TO KEY)**

#include<stdio.h>

#include<time.h>

#include<stdlib.h>

#define MAX 100

void sort(int A[], int n)

{

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

{

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

{

if(A[j] > A[j+1])

{

int temp = A[j];

A[j] = A[j+1];

A[j+1] = temp;

}

}

}

}

int count\_diff(int A[], int key, int n)

{

int count = 0;

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

{

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

{

if(A[j]-A[i] == key)

{

count++;

}

}

}

return count;

}

int main()

{

int t, key, A[MAX], n;

int count=0;

printf("Enter the number of test case: ");

scanf("%d",&t);

while(t--)

{

printf("Enter the size of array: ");

scanf("%d",&n);

printf("Enter the elements of array: ");

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

{

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

}

printf("Enter the key value: ");

scanf("%d",&key);

sort(A, n);

count = count\_diff(A, key, n);

printf("Total count %d\n",count);

}

if(!count)

{

printf("No pair found");

}

return 0;

}

***OUTPUT:***

Enter the number of test case: 2

Enter the size of array: 5

Enter the elements of array: 2 4 6 8 10

Enter the key value: 4

Total count 3

Enter the size of array: 4

Enter the elements of array: 45 78 90 95

Enter the key value: 90

Total count 0

No pair found