**USE FUNCTIONS**

**1.Given an array Arr of size N, print second largest distinct element from an array. Find the second largest without sorting.**

**CODE :**

#include <stdio.h>

int secondLargestDistinct(int Arr[], int N) {

int firstLargest = -1, secondLargest = -1;

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

if (Arr[i] > firstLargest) {

secondLargest = firstLargest;

firstLargest = Arr[i];

} else if (Arr[i] > secondLargest && Arr[i] != firstLargest) {

secondLargest = Arr[i];

}

}

return secondLargest;

}

int main() {

int N;

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

scanf("%d", &N);

int Arr[N];

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

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

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

}

int result = secondLargestDistinct(Arr, N);

printf("The second largest distinct element is: %d\n", result);

return 0;

}

**2.Given an array Arr of N positive integers and another number X. Determine whether or not there exist two elements in Arr whose sum is exactly X.[Without Sorting]**

**CODE** :

#include <stdio.h>

int hasPairWithSum(int Arr[], int N, int X) {

for (int i = 0; i < N - 1; i++) {

for (int j = i + 1; j < N; j++) {

if (Arr[i] + Arr[j] == X) {

return 1;

}

}

}

return 0;

}

int main() {

int N, X;

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

scanf("%d", &N);

int Arr[N];

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

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

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

}

printf("Enter the value of X: ");

scanf("%d", &X);

if (hasPairWithSum(Arr, N, X)) {

printf("Yes, there exist two elements whose sum is %d.\n", X);

} else {

printf("No, there are no such elements whose sum is %d.\n", X);

}

return 0;

}

**3.First and last occurrences of x**

**Given a sorted array arr containing n elements with possibly some duplicate, the task is to find the first and last occurrences of an element x in the given array.**

**CODE :**

#include <stdio.h>

void findFirstAndLast(int arr[], int n, int x) {

int first = -1, last = -1;

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

if (arr[i] == x) {

first = i;

break;

}

}

for (int i = n - 1; i >= 0; i--) {

if (arr[i] == x) {

last = i;

break;

}

}

printf("%d %d\n", first, last);

}

int main() {

int n, x;

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

scanf("%d", &n);

int arr[n];

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

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

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

}

printf("Enter the value of x: ");

scanf("%d", &x);

findFirstAndLast(arr, n, x);

return 0;

}