RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI
ENGINEERING COLLEGE

CS23331

Design and Analysis Algorithm

Laboratory Observation Note Book

Started on	Friday, 30 August 2024, 1:37 PM
State	Finished
Completed on	Friday, 13 September 2024, 2:00 PM
Time taken	14 days
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Problem Statement

Given an array of 1s and 0s this has all 1s first followed by all 0s. Aim is to find the number of 0s. Write a program using Divide and Conquer to Count the number of zeroes in the given array.

Input Format

First Line Contains Integer m – Size of array

Next m lines Contains m numbers – Elements of an array

Output Format

First Line Contains Integer – Number of zeroes present in the given array.

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
int main() {
    int m;
    scanf("%d", &m);
    int arr[m];
    for (int i = 0; i < m; i++) {
        scanf("%d", &arr[i]);
    }
    int left = 0;
    int right = m - 1;
    int firstZeroIndex = -1;
    while (left <= right) {
        int mid = left + (right - left) / 2;
        if (arr[mid] == 0) {
            firstZeroIndex = mid;
            right = mid - 1;
        } else {
            left = mid + 1;
```

	Input	Expected	Got	
✔	5 1 1 1 0 0	2	2	✔
✔	10 1 1 1 1 1 1 1 1 1 1	0	0	✔

	Input	Expected	Got	
✔	8 0 0 0 0 0 0 0 0	8	8	✔
✔	17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	2	2	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 5-G-Product of Array elements-Minimum

Jump to...

2-Majority Element ►

Started on	Friday, 20 September 2024, 1:31 PM
State	Finished
Completed on	Friday, 20 September 2024, 1:52 PM
Time taken	20 mins 25 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Given an array `nums` of size `n`, return *the majority element*.

The majority element is the element that appears more than `⌊n / 2⌋` times. You may assume that the majority element always exists in the array.

Example 1:

```
Input: nums = [3,2,3]
Output: 3
```

Example 2:

```
Input: nums = [2,2,1,1,1,2,2]
Output: 2
```

Constraints:

- `n == nums.length`
- `1 <= n <= 5 * 10^4`
- `-2^31 <= nums[i] <= 2^31 - 1`

For example:

Input	Result
3 3 2 3	3
7 2 2 1 1 1 2 2	2

Answer: (penalty regime: 0 %)

```
#include<stdio.h>
int main(){
    int n;
    scanf("%d",&n);
    int a[n];
    for(int i=0;i<n;i++){
        scanf("%d",&a[i]);
    }
    for(int i=0;i<n;i++){
        int count=0;
        for(int j=0;j<n;j++){
            if(a[i]==a[j]){
                count++;
            }
        }
        if(count>n/2){
            printf("%d",a[i]);
            break;
        }
    }
}
```

	Input	Expected	Got	
✔	3 3 2 3	3	3	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 1-Number of Zeros in a Given Array

Jump to...

3-Finding Floor Value ►

Started on	Friday, 20 September 2024, 1:55 PM
State	Finished
Completed on	Friday, 20 September 2024, 1:57 PM
Time taken	1 min 54 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Problem Statement:

Given a sorted array and a value x, the floor of x is the largest element in array smaller than or equal to x. Write divide and conquer algorithm to find floor of x.

Input Format

First Line Contains Integer n – Size of array

Next n lines Contains n numbers – Elements of an array

Last Line Contains Integer x – Value for x

Output Format

First Line Contains Integer – Floor value for x

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
int Floor(int arr[], int n, int x) {
    int low = 0, high = n - 1;
    int floorValue = -1;
    while (low <= high) {
        int mid = low + (high - low) / 2;
        if (arr[mid] == x) {
            return arr[mid];
        } else if (arr[mid] < x) {
            floorValue = arr[mid];
            low = mid + 1;
        } else {
            high = mid - 1;
        }
    }
    return floorValue;
}
int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int x;
    scanf("%d", &x);
    int result = Floor(arr, n, x);
    if (result == -1) {
        printf("No floor value found\n");
    } else {
        printf("%d\n", result);
    }
 return 0;
}
```

	Input	Expected	Got	
✔	6 1 2 8 10 12 19 5	2	2	✔

	Input	Expected	Got	
✔	5 10 22 85 108 129 100	85	85	✔
✔	7 3 5 7 9 11 13 15 10	9	9	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 2-Majority Element

Jump to...

4-Two Elements sum to x ►

Question **1**

Correct

Mark 1.00 out of 1.00

Problem Statement:

Given a sorted array of integers say arr[] and a number x. Write a recursive program using divide and conquer strategy to check if there exist two elements in the array whose sum = x. If there exist such two elements then return the numbers, otherwise print as "No".

Note: Write a Divide and Conquer Solution

Input Format

First Line Contains Integer n – Size of array

Next n lines Contains n numbers – Elements of an array

Last Line Contains Integer x – Sum Value

Output Format

First Line Contains Integer – Element1

Second Line Contains Integer – Element2 (Element 1 and Elements 2 together sums to value "x")

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
int Pair(int arr[], int left, int right, int x) {
    if (left >= right) {
        return 0;
    }
    if (arr[left] + arr[right] == x) {
        printf("%d\n%d\n", arr[left], arr[right]);
        return 1;
    }
    else if (arr[left] + arr[right] < x) {
        return Pair(arr, left + 1, right, x);
    }
    else {
        return Pair(arr, left, right - 1, x);
    }
}
int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int x;
    scanf("%d", &x);
    if (Pair(arr, 0, n - 1, x)) {
    }
    else {
        printf("No\n");
    }
    return 0;
}
```

Check

	Input	Expected	Got	
✔	4 2 4 8 10 14	4 10	4 10	✔
✔	5 2 4 6 8 10 100	No	No	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 3-Finding Floor Value

Jump to...

5-Implementation of Quick Sort ►

Started on	Friday, 20 September 2024, 2:00 PM
State	Finished
Completed on	Friday, 20 September 2024, 2:04 PM
Time taken	4 mins 12 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Write a Program to Implement the Quick Sort Algorithm

Input Format:
The first line contains the no of elements in the list-n
The next n lines contain the elements.

Output:
Sorted list of elements

For example:

Input	Result
5 67 34 12 98 78	12 34 67 78 98

Answer:

```c
#include <stdio.h>
void swap(int* a, int* b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}
int partition(int arr[], int low, int high) {
    int pivot = arr[high];
    int i = low - 1;
    for (int j = low; j < high; j++) {
        if (arr[j] <= pivot) {
            i++;
            swap(&arr[i], &arr[j]);
        }
    }
    swap(&arr[i + 1], &arr[high]);
    return i + 1;
}
void quickSort(int arr[], int low, int high) {
    if (low < high) {
        int pi = partition(arr, low, high);
        quickSort(arr, low, pi - 1);
        quickSort(arr, pi + 1, high);
    }
}
int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    quickSort(arr, 0, n - 1);
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    return 0;
}
```

	Input	Expected	Got	
✔	5 67 34 12 98 78	12 34 67 78 98	12 34 67 78 98	✔

	Input	Expected	Got	
✔	10 1 56 78 90 32 56 11 10 90 114	1 10 11 32 56 56 78 90 90 114	1 10 11 32 56 56 78 90 90 114	✔
✔	12 9 8 7 6 5 4 3 2 1 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	1 2 3 4 5 6 7 8 9 10 11 90	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 4-Two Elements sum to x

Jump to...

1-DP-Playing with Numbers ►

Started on	Friday, 18 October 2024, 1:49 PM
State	Finished
Completed on	Friday, 18 October 2024, 2:25 PM
Time taken	36 mins 44 secs
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 10.00 out of 10.00

Playing with Numbers:

Ram and Sita are playing with numbers by giving puzzles to each other. Now it was Ram term, so he gave Sita a positive integer 'n' and two numbers 1 and 3. He asked her to find the possible ways by which the number n can be represented using 1 and 3.Write any efficient algorithm to find the possible ways.

Example 1:

Input: *6*
Output:*6*
Explanation: *There are 6 ways to 6 represent number with 1 and 3*

1+1+1+1+1+1
3+3
1+1+1+3
1+1+3+1
1+3+1+1
3+1+1+1

Input Format

First Line contains the number n

Output Format

Print: The number of possible ways 'n' can be represented using 1 and 3

Sample Input

6

Sample Output

6

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
#include <stdlib.h>
long long count_ways(int n);
int main() {
    int n;
    scanf("%d", &n);
    if (n < 0) {
        printf("0\n");
        return 1;
    }
    long long result = count_ways(n);
    printf("%lld\n", result);
    return 0;
}
long long count_ways(int n) {
    if (n < 0) return 0;
    long long*dp = (long long*)malloc((n + 1)* sizeof(long long));
    if (dp == NULL) {
        return -1;
    }
    dp[0] = 1;
    dp[1] = 1;
    dp[2] = 1;
    dp[3] = 2;
for (int i = 4; i <= n; i++) {
        dp[i] = dp[i - 1] + dp[i - 3];
    }
    long long result = dp[n];
    free(dp);
    return result ;
}

```

	Input	Expected	Got	
✔	6	6	6	✔
✔	25	8641	8641	✔
✔	100	24382819596721629	24382819596721629	✔

Passed all tests! ✔

Correct

Marks for this submission: 10.00/10.00.

◄ 5-Implementation of Quick Sort

Jump to...

2-DP-Playing with chessboard ►

Started on	Friday, 18 October 2024, 2:26 PM
State	Finished
Completed on	Friday, 18 October 2024, 2:37 PM
Time taken	10 mins 57 secs
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 10.00 out of 10.00

Playing with Chessboard:

Ram is given with an n*n chessboard with each cell with a monetary value. Ram stands at the (0,0), that the position of the top left white rook. He is been given a task to reach the bottom right black rook position (n-1, n-1) constrained that he needs to reach the position by traveling the maximum monetary path under the condition that he can only travel one step right or one step down the board. Help ram to achieve it by providing an efficient DP algorithm.

Example:
Input
3
1 2 4
2 3 4
8 7 1
Output:
19

Explanation:
Totally there will be 6 paths among that the optimal is
Optimal path value:1+2+8+7+1=19

Input Format
First Line contains the integer n
The next n lines contain the n*n chessboard values

Output Format

Print Maximum monetary value of the path

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
#include <stdlib.h>
int main() {
    int n;
    scanf("%d",&n);
    int **cb = (int **)malloc(n * sizeof(int *));
    int **dp = (int **)malloc(n * sizeof(int *));
    for (int i = 0; i < n; i++) {
        cb[i] = (int *)malloc(n * sizeof(int));
        dp[i] = (int *)malloc(n * sizeof(int));
        for (int j = 0; j < n; j++) {
            scanf("%d", &cb[i][j]);
        }
    }
    dp[0][0] = cb[0][0];
    for (int j = 1; j < n; j++)
        dp[0][j] = dp[0][j - 1] + cb[0][j];
    for (int i = 1; i < n; i++)
        dp[i][0] = dp[i - 1][0] + cb[i][0];
    for (int i = 1; i < n; i++)
        for (int j = 1; j < n; j++)
            dp[i][j] = cb[i][j] + (dp[i - 1][j]> dp[i][j - 1] ? dp[i - 1][j] : dp[i][j - 1]);
    printf("%d\n", dp[n - 1][n - 1]);
    for (int i = 0; i < n; i++) {
        free(cb[i]);
        free(dp[i]);
    }
    free(cb);
    free(dp);
    return 0;
}
```

	Input	Expected	Got	
✔	3 1 2 4 2 3 4 8 7 1	19	19	✔
✔	3 1 3 1 1 5 1 4 2 1	12	12	✔
✔	4 1 1 3 4 1 5 7 8 2 3 4 6 1 6 9 0	28	28	✔

Passed all tests! ✔

Correct

Marks for this submission: 10.00/10.00.

◄ 1-DP-Playing with Numbers

Jump to...

3-DP-Longest Common Subsequence ►

Started on	Friday, 18 October 2024, 2:40 PM
State	Finished
Completed on	Friday, 18 October 2024, 2:48 PM
Time taken	8 mins 29 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Given two strings find the length of the common longest subsequence(need not be contiguous) between the two.

Example:

s1: ggtabe

s2: tgatasb

s1	a	g	g	t	a	b	
s2	g	x	t	x	a	y	b

The length is 4

Solveing it using Dynamic Programming

For example:

Input	Result
aab azb	2

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
#include <string.h>
#define MAX_LEN 100
int lcsLength(const char *s1, const char *s2)
{
    int len1 = strlen(s1);
    int len2 = strlen(s2);
    int dp[MAX_LEN + 1][MAX_LEN + 1];
    for (int i = 0; i <= len1; i++) {
        for (int j = 0; j <= len2; j++) {
            if (i == 0 || j == 0) {
                dp[i][j] = 0;
            } else if (s1[i - 1] == s2[j - 1]) {
                dp[i][j] = dp[i - 1][j - 1] + 1;
            } else {
                dp[i][j] = dp[i - 1][j] > dp[i][j - 1] ? dp[i - 1][j] : dp[i][j - 1];
            }
        }
    }
    return dp[len1][len2];
}
int main() {
    char s1[MAX_LEN + 1], s2[MAX_LEN + 1];
    scanf("%s", s1);
    scanf("%s", s2);
    int result = lcsLength(s1, s2);
    printf("%d\n", result);
    return 0;
}

```

	Input	Expected	Got	
✔	aab azb	2	2	✔

	Input	Expected	Got	
✔	ABCD ABCD	4	4	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 2-DP-Playing with chessboard

Jump to...

4-DP-Longest non-decreasing Subsequence ►

Started on	Sunday, 17 November 2024, 1:13 PM
State	Finished
Completed on	Sunday, 17 November 2024, 1:15 PM
Time taken	1 min 46 secs
Marks	1.00/1.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Problem statement:

Find the length of the Longest Non-decreasing Subsequence in a given Sequence.

Eg:

Input:9

Sequence:[-1,3,4,5,2,2,2,2,3]

the subsequence is [-1,2,2,2,2,3]

Output:6

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
#include <stdlib.h>

int longestNonDecreasingSubsequence(int seq[], int n) {
    int dp[n];

    for (int i = 0; i < n; i++) {
        dp[i] = 1;
    }

    for (int i = 1; i < n; i++) {
        for (int j = 0; j < i; j++) {
            if (seq[i] >= seq[j]) {
                dp[i] = dp[i] > dp[j] + 1 ? dp[i] : dp[j] + 1;
            }
        }
    }

    int maxLength = 1;
    for (int i = 0; i < n; i++) {
        if (dp[i] > maxLength) {
            maxLength = dp[i];
        }
    }

    return maxLength;
}

int main() {
    int seq[] = {-1, 3, 4, 5, 2, 2, 2, 2, 3};
    int n = sizeof(seq) / sizeof(seq[0]);

    int length = longestNonDecreasingSubsequence(seq, n);
    printf("%d\n", length);

    return 0;
}

```

	Input	Expected	Got	
✔	9 -1 3 4 5 2 2 2 2 3	6	6	✔
✔	7 1 2 2 4 5 7 6	6	6	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 3-DP-Longest Common Subsequence

Jump to...

1-Finding Duplicates-O(n^2) Time Complexity,O(1) Space Complexity ►

Started on	Friday, 16 August 2024, 1:40 PM
State	Finished
Completed on	Friday, 16 August 2024, 1:49 PM
Time taken	8 mins 10 secs
Marks	1.00/1.00
Grade	**4.00** out of 4.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Find Duplicate in Array.

Given a read only array of n integers between 1 and n, find one number that repeats.

Input Format:

First Line - Number of elements

n Lines - n Elements

Output Format:

Element x - That is repeated

For example:

Input	Result
5 1 1 2 3 4	1

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
int find_duplicate(int arr[], int n) {
    int a= arr[0];
    int b = arr[0];
    do
    {
        a = arr[a];
        b = arr[arr[b]];
    }
    while (a!=b);
    a = arr[0];
    while (a!=b) {
        a = arr[a];
        b = arr[b];
    }
    return a;
}
int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    int duplicate = find_duplicate(arr, n);
    printf("%d\n", duplicate);
    return 0;
}
```

	Input	Expected	Got	
✔	11 10 9 7 6 5 1 2 3 8 4 7	7	7	✔
✔	5 1 2 3 4 4	4	4	✔
✔	5 1 1 2 3 4	1	1	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 4-DP-Longest non-decreasing Subsequence

Jump to...

2-Finding Duplicates-O(n) Time Complexity,O(1) Space Complexity ►

Started on	Friday, 16 August 2024, 1:49 PM
State	Finished
Completed on	Friday, 16 August 2024, 1:54 PM
Time taken	5 mins 3 secs
Marks	1.00/1.00
Grade	**4.00** out of 4.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Find Duplicate in Array.

Given a read only array of n integers between 1 and n, find one number that repeats.

Input Format:

First Line - Number of elements

n Lines - n Elements

Output Format:

Element x - That is repeated

For example:

Input	Result
5 1 1 2 3 4	1

Answer: (penalty regime: 0 %)

```c
#include <stdio.h>
int find_duplicate(int arr[], int n) {
    int a = arr[0];
    int b = arr[0];
    do
    {
        a = arr[a];
        b = arr[arr[b]];
    }
    while (a != b);
    a = arr[0];
    while (a != b) {
        a = arr[a];
        b = arr[b];
    }
    return a;
}
int main() {
    int n;
    scanf("%d", &n);
    int arr[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int duplicate = find_duplicate(arr, n);
    printf("%d\n", duplicate);
    return 0;
}

```

	Input	Expected	Got	
✔	11 10 9 7 6 5 1 2 3 8 4 7	7	7	✔
✔	5 1 2 3 4 4	4	4	✔
✔	5 1 1 2 3 4	1	1	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 1-Finding Duplicates-O(n^2) Time Complexity,O(1) Space Complexity

Jump to...

3-Print Intersection of 2 sorted arrays-O(m*n)Time Complexity,O(1) Space Complexity ►

Started on	Friday, 16 August 2024, 1:56 PM
State	Finished
Completed on	Friday, 16 August 2024, 2:02 PM
Time taken	6 mins 6 secs
Marks	1.00/1.00
Grade	**30.00** out of 30.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Find the intersection of two sorted arrays.

OR in other words,

Given 2 sorted arrays, find all the elements which occur in both the arrays.

Input Format

· The first line contains T, the number of test cases. Following T lines contain:

1. Line 1 contains N1, followed by N1 integers of the first array
2. Line 2 contains N2, followed by N2 integers of the second array

Output Format

The intersection of the arrays in a single line

Example

Input:

1

3 10 17 57

6 2 7 10 15 57 246

Output:

10 57

Input:

1

6 1 2 3 4 5 6

2 1 6

Output:

1 6

For example:

Input	Result
1 3 10 17 57 6 2 7 10 15 57 246	10 57

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
int main() {
    int n;
    scanf("%d", &n);
    while (n--) {
        int n1, n2;
        scanf("%d", &n1);
        int arr1[n1];
        for (int i = 0; i < n1; i++) {
            scanf("%d", &arr1[i]);
        }
        scanf("%d", &n2);
        int arr2[n2];
        for (int i = 0; i < n2; i++) {
            scanf("%d", &arr2[i]);
        }
        int i = 0, j = 0;
        int a = 1;
        while (i < n1 && j < n2) {
            if (arr1[i] == arr2[j]) {
                if (!a) {
                    printf(" ");
```

```
                }
                printf("%d", arr1[i]);
                a = 0;
                i++;
                j++;
            } else if (arr1[i] < arr2[j]) {
                i++;
            } else {
                j++;
            }
        }
        printf("\n");
    }
    return 0;
}
```

	Input	Expected	Got	
✔	1 3 10 17 57 6 2 7 10 15 57 246	10 57	10 57	✔
✔	1 6 1 2 3 4 5 6 2 1 6	1 6	1 6	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 2-Finding Duplicates-O(n) Time Complexity,O(1) Space Complexity

Jump to...

4-Print Intersection of 2 sorted arrays-O(m+n)Time Complexity,O(1) Space Complexity ►

Started on	Friday, 16 August 2024, 2:03 PM
State	Finished
Completed on	Friday, 16 August 2024, 4:03 PM
Time taken	2 hours
Marks	1.00/1.00
Grade	**30.00** out of 30.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Find the intersection of two sorted arrays.

OR in other words,

Given 2 sorted arrays, find all the elements which occur in both the arrays.

Input Format

· The first line contains T, the number of test cases. Following T lines contain:

1. Line 1 contains N1, followed by N1 integers of the first array
2. Line 2 contains N2, followed by N2 integers of the second array

Output Format

The intersection of the arrays in a single line

Example

Input:

1

3 10 17 57

6 2 7 10 15 57 246

Output:

10 57

Input:

1

6 1 2 3 4 5 6

2 1 6

Output:

1 6

For example:

Input	Result
1 3 10 17 57 6 2 7 10 15 57 246	10 57

Answer: (penalty regime: 0 %)

```
#include <stdio.h>

int main() {
    int T;
    scanf("%d", &T);

    while (T--) {
        int n1, n2;

        scanf("%d", &n1);
        int arr1[n1];
        for (int i = 0; i < n1; i++) {
            scanf("%d", &arr1[i]);
        }

        scanf("%d", &n2);
        int arr2[n2];
        for (int i = 0; i < n2; i++) {
            scanf("%d", &arr2[i]);
        }

        int i = 0, j = 0;
```

```
        int first = 1;

        while (i < n1 && j < n2) {
            if (arr1[i] == arr2[j]) {
                if (!first) {
                    printf(" ");
                }
                printf("%d", arr1[i]);
                first = 0;
                i++;
                j++;
            } else if (arr1[i] < arr2[j]) {
                i++;
            } else {
                j++;
            }
        }
        printf("\n");
    }

    return 0;
}
```

	Input	Expected	Got	
✔	1 3 10 17 57 6 2 7 10 15 57 246	10 57	10 57	✔
✔	1 6 1 2 3 4 5 6 2 1 6	1 6	1 6	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 3-Print Intersection of 2 sorted arrays-O(m*n)Time Complexity,O(1) Space Complexity

Jump to...

5-Pair with Difference-O(n^2)Time Complexity,O(1) Space Complexity ►

Started on	Friday, 25 October 2024, 1:34 PM
State	Finished
Completed on	Friday, 25 October 2024, 1:38 PM
Time taken	4 mins 23 secs
Marks	1.00/1.00
Grade	**4.00** out of 4.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that A[j] - A[i] = k, i != j.

Input Format:

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

Output Format:

1 - If pair exists

0 - If no pair exists

Explanation for the given Sample Testcase:

YES as 5 - 1 = 4

So Return 1.

For example:

Input	Result
3 1 3 5 4	1

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
int main() {
    int n, k;
    scanf("%d", &n);
    int A[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &A[i]);
    }
    scanf("%d", &k);
    int i = 0, j = 0;
    while (j < n) {
        if (A[j] - A[i] < k) {
            j++;
        } else if (A[j] - A[i] > k) {
            i++;
        } else {
            if (i != j) {
                printf("1\n");
                return 0;
            }
            j++;
        }
        if (i == j) {
            j++;
        }
    }
    printf("0\n");
    return 0;
}
```

	Input	Expected	Got	
✔	3 1 3 5 4	1	1	✔
✔	10 1 4 6 8 12 14 15 20 21 25 1	1	1	✔
✔	10 1 2 3 5 11 14 16 24 28 29 0	0	0	✔
✔	10 0 2 3 7 13 14 15 20 24 25 10	1	1	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 4-Print Intersection of 2 sorted arrays-O(m+n)Time Complexity,O(1) Space Complexity

Jump to...

6-Pair with Difference -O(n) Time Complexity,O(1) Space Complexity ►

Started on	Friday, 25 October 2024, 1:39 PM
State	Finished
Completed on	Friday, 25 October 2024, 1:41 PM
Time taken	1 min 34 secs
Marks	1.00/1.00
Grade	**4.00** out of 4.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that A[j] - A[i] = k, i != j.

Input Format:

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

Output Format:

1 - If pair exists

0 - If no pair exists

Explanation for the given Sample Testcase:

YES as 5 - 1 = 4

So Return 1.

For example:

Input	Result
3 1 3 5 4	1

Answer: (penalty regime: 0 %)

```
#include <stdio.h>
int main() {
    int n, k;
    scanf("%d", &n);
    int A[n];
    for (int i = 0; i < n; i++) {
        scanf("%d", &A[i]);
    }
    scanf("%d", &k);
    int i = 0, j = 0;
    while (j < n) {
        if (A[j] - A[i] < k) {
            j++;
        } else if (A[j] - A[i] > k) {
            i++;
        } else {
            if (i != j) {
                printf("1\n");
                return 0;
            }
            j++;
        }
        if (i == j) {
            j++;
        }
    }
    printf("0\n");
    return 0;
}
```

	Input	Expected	Got	
✔	3 1 3 5 4	1	1	✔
✔	10 1 4 6 8 12 14 15 20 21 25 1	1	1	✔
✔	10 1 2 3 5 11 14 16 24 28 29 0	0	0	✔
✔	10 0 2 3 7 13 14 15 20 24 25 10	1	1	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

◄ 5-Pair with Difference-O(n^2)Time Complexity,O(1) Space Complexity

Jump to...