

Experiment 1(a)

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Branch: CSE

Section/Group:602-A

Semester: 5th

Date of Performance:18-01-25

Subject Name: Advanced Programming Lab-1

Subject Code: 22CSP-314

1. Title: Array Reversal

2. Aim: Given an array, of size, reverse it. Example: If array, arr= {1,2,3,4,5}, after reversing it, the array should be, arr= {5,4,3,2,1}.

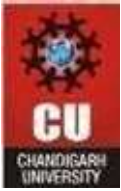
3. Objective: The objective of the problem "Given an array of size n , reverse it" is to write a function that takes an array of a given size as input and returns a new array where the order of the elements is reversed.

4. Implementation/Code:

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

int main()
{
    int num, *arr, i;
    scanf("%d", &num);
    arr = (int*) malloc(num * sizeof(int));
    for(i = 0; i < num; i++) {
        scanf("%d", arr + i);
    }

    int temp;
    for(i = 0; i < num / 2; i++) {
        temp = arr[i];
        arr[i] = arr[num - i - 1];
```



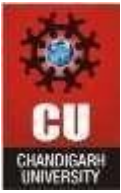
```
        arr[num - i - 1] = temp;
    }
    for(i = 0; i < num; i++)
        printf("%d ", *(arr + i));
    return 0;
}
```

5. Output:

Test case 0	Compiler Message	
Test case 1	Success	
Test case 2	Input (stdin)	Download
Test case 3	1 6	
Test case 4	2 16 13 7 2 1 12	
Test case 5	Expected Output	Download
Test case 6	1 12 1 2 7 13 16	

6. Time Complexity: $O(n)$

7. Space Complexity: $O(n)$



Experiment 1(B)

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Subject Name: Advanced Programming Lab-1

Subject Code: 22CSP-314

1. Title: Sum of Array

2. Aim: Given an array of integers, find the sum of its elements. For example, if the array, so return.

3. Objective:

- Read Input: Take an integer input representing the number of elements, followed by a line of space-separated integers.
- Calculate Sum: Compute the sum of these integers as they are read.

Output Result: Print the calculated sum.

4. Implementation/Code:

```
Change Theme  Language C++11
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int n, sum = 0, value;
6
7      cin >> n;
8      for (int i = 0; i < n; i++) {
9          cin >> value;
10         sum += value;
11     }
12
13     cout << sum << endl;
14     return 0;
15 }
16
```

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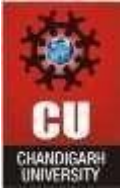
5. Output:

The screenshot displays a coding platform interface with a dark theme. On the left, a sidebar lists three test cases, all marked as successful with green checkmarks: 'Test case 0', 'Test case 1', and 'Test case 2'. The main area shows details for 'Test case 0'. It includes a 'Compiler Message' section with a 'Success' status. Below this is the 'Input (stdin)' section, which contains two lines of input: '6' on the first line and '1 2 3 4 10 11' on the second line. The 'Expected Output' section shows the value '31' for the first line of output. A 'Download' link is visible on the right side of the input and output sections.

Test Case	Compiler Message	Input (stdin)	Expected Output
Test case 0	Success	6 1 2 3 4 10 11	31

6. Time Complexity: $O(n)$

7. Space Complexity: $O(1)$



Experiment 1(D)

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Semester: 5th

Date of Performance:18-01-25

Subject Name: Advanced Programming Lab-1

Subject Code: 22CSP-314

1. Title: Diagonal Difference

2. Aim:

Given a square matrix, calculate the absolute difference between the sums of its diagonals.

For example, the square matrix is shown below:

1 2 3

4 5 6

9 8 9

The left-to-right diagonal =. The right to left diagonal =. Their absolute difference is.

3. Objective:

The objective of this program is to compare the ratings of two challenges created by Alice and The objective of this code is to compute the absolute difference between the sums of the diagonals of a square matrix. Given a square matrix of size $n \times n$ the program performs the following tasks:

Input Handling: It reads the size of the matrix $n \times n$ and the matrix elements from the standard input.

Diagonal Sum Calculation: It calculates the sum of the elements in the left-to-right diagonal and the sum of the elements in the right-to-left diagonal.

Absolute Difference: It computes the absolute difference between these two diagonal sums.

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4. Implementation/Code:

```
1  #include <iostream>
2  #include <cmath>
3  using namespace std;
4
5  int main() {
6      int n;
7      cin >> n;
8      int matrix[n][n];
9
10     for (int i = 0; i < n; i++) {
11         for (int j = 0; j < n; j++) {
12             cin >> matrix[i][j];
13         }
14     }
15     int LRdiagSum = 0;
16     int RLdiagSum = 0;
17     for (int i = 0; i < n; i++) {
18         LRdiagSum += matrix[i][i];
19         RLdiagSum += matrix[i][n - 1 - i];
20     }
21     int difference = abs(LRdiagSum - RLdiagSum);
22     cout << difference;
23
24     return 0;
25 }
26
```

5. Output:

The screenshot displays a code execution environment with a sidebar on the left listing test cases from 0 to 6, each marked with a green checkmark. The main area is divided into three sections: 'Compiler Message' showing 'Success', 'Input (stdin)' showing a 4x4 matrix, and 'Expected Output' showing the value 15. A 'Download' link is present next to the input and output sections.

Test case 0 ✓

Test case 1 ✓

Test case 2 ✓

Test case 3 ✓

Test case 4 ✓

Test case 5 ✓

Test case 6 ✓

Compiler Message

Success

Input (stdin) Download

1	3
2	11 2 4
3	4 5 6
4	10 8 -12

Expected Output Download

1	15
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6. **Time Complexity:** $O(n^2)$

7. **Space Complexity:** $O(n^2)$