

***Ahsania Mission University of Science & Technology***

## **Lab Report-01**

**Lab No: 01**

**Lab Title: Computer Algorithms**

**Course Code: CSE 2204**

**Course Title: Computer Algorithms Sessional.**

***Submitted By:***

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1<sup>st</sup> Batch, 2<sup>nd</sup> Year, 2<sup>nd</sup> Semester

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## Task 01: Marge Two Arrays....

### Source Code

```
#include <bits/stdc++.h>
using namespace std;

int main() {
    int arr1[100] = {2, 4, 6};
    int size1 = 3;

    int arr2[100] = {8, 10, 12, 14};
    int size2 = 4;

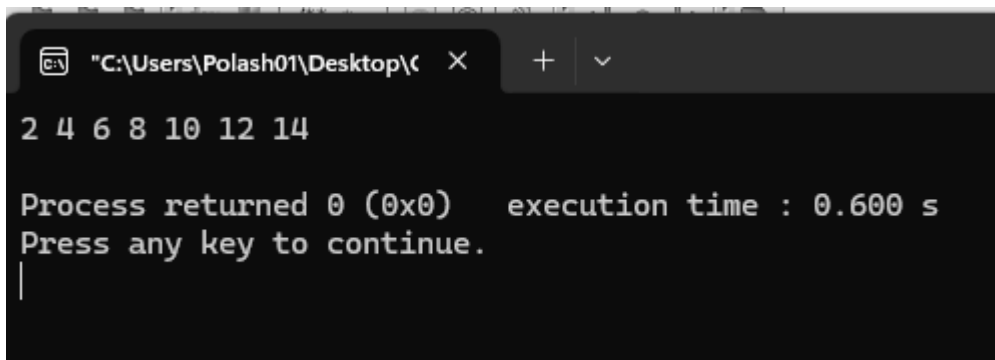
    int merged[200];
    int mergedSize = size1 + size2;

    for(int i = 0; i < size1; i++)
        merged[i] = arr1[i];

    for(int i = 0; i < size2; i++)
        merged[size1 + i] = arr2[i];

    for(int i = 0; i < mergedSize; i++)
        cout << merged[i] << " ";
    cout << endl;
    return 0;
}
```

### Output:



```
"C:\Users\Polash01\Desktop\c" X + v
2 4 6 8 10 12 14
Process returned 0 (0x0) execution time : 0.600 s
Press any key to continue.
|
```

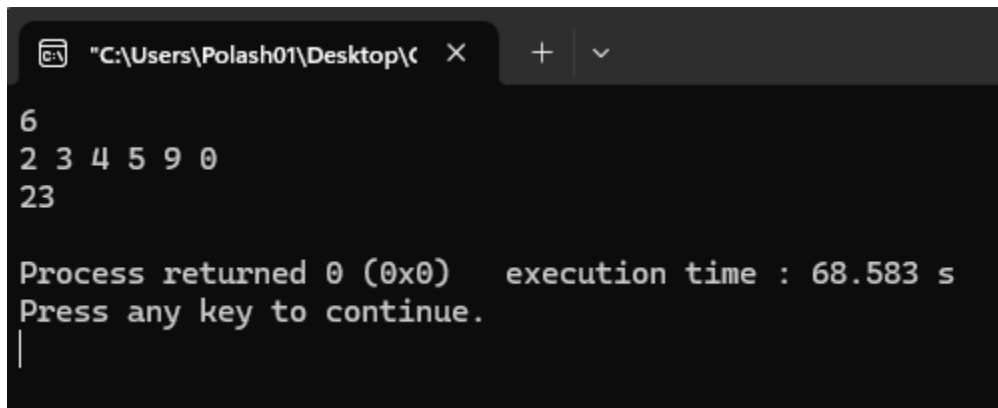
## Task02: Sum of Array Elements

### Source Code

```
#include <bits/stdc++.h>
using namespace std;

int main() {
    int n, sum = 0;
    cin >> n;
    int a[n];
    for(int i = 0; i < n; i++) {
        cin >> a[i];
        sum += a[i];
    }
    cout << sum << endl;
    return 0;
}
```

### Output:

A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\Polash01\Desktop\..." and standard window controls. The terminal displays the following output: the number "6" on the first line, the numbers "2 3 4 5 9 0" on the second line, and the number "23" on the third line. Below these, it shows "Process returned 0 (0x0) execution time : 68.583 s" and "Press any key to continue." with a cursor on the line below.

```
"C:\Users\Polash01\Desktop\..." X + v
6
2 3 4 5 9 0
23
Process returned 0 (0x0) execution time : 68.583 s
Press any key to continue.
|
```

## Task03:Find Maximum in an Array

### Source Code

```
#include <bits/stdc++.h>
using namespace std;

int main() {
    int t;
```

```

printf("Enter number of test cases: ");
cin >> t;

while(t-->0) {
    int n, maxVal = 0;
    printf("\nEnter size of the array: ");
    cin >> n;

    int a[n];
    printf("Enter %d integers: ", n);
    for(int i = 0; i < n; i++) {
        cin >> a[i];
        maxVal = max(maxVal, a[i]);
    }

    cout << "Maximum value in this array: " << maxVal << endl;
}

return 0;
}

```

**Output :**

```

C:\Users\Polash01\Desktop\...
Enter number of test cases: 2

Enter size of the array: 7
Enter 7 integers: 0 5 3 2 7 9 4
Maximum value in this array: 9

Enter size of the array: 7
Enter 7 integers: 4 9 7 2 3 5 0
Maximum value in this array: 9

Process returned 0 (0x0)   execution time : 126.139 s
Press any key to continue.

```

#### Task04: Min to Max Problem

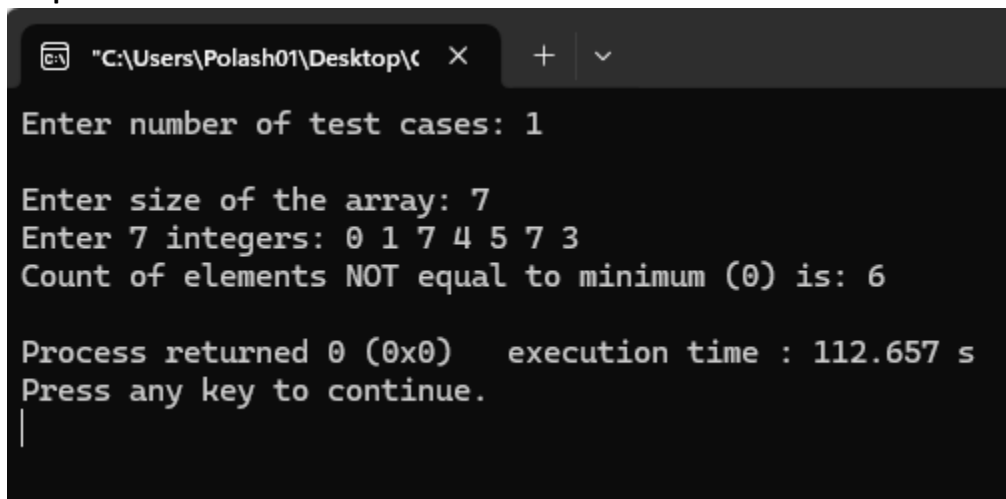
[Source Code](#)

```
#include <bits/stdc++.h>
```

```
using namespace std;
```

```
int main() {  
    int t;  
    cout << "Enter number of test cases: ";  
    cin >> t;  
    while(t-->0) {  
        int n;  
        cout << "\nEnter size of the array: ";  
        cin >> n;  
        int a[n], minVal = 101, count = 0;  
        cout << "Enter " << n << " integers: ";  
        for(int i = 0; i < n; i++) {  
            cin >> a[i];  
            minVal = min(minVal, a[i]);  
        }  
        for(int i = 0; i < n; i++) {  
            if(a[i] != minVal) count++;  
        }  
        cout << "Count of elements NOT equal to minimum (" << minVal << ") is: " << count << endl;  
    }  
    return 0;  
}
```

**Output:**



```
"C:\Users\Polash01\Desktop\... X + v  
Enter number of test cases: 1  
  
Enter size of the array: 7  
Enter 7 integers: 0 1 7 4 5 7 3  
Count of elements NOT equal to minimum (0) is: 6  
  
Process returned 0 (0x0) execution time : 112.657 s  
Press any key to continue.  
|
```

**Task05: Grade-School multiplication with big integer**

[Source Code](#)

```
#include <iostream>  
#include <cstring>  
using namespace std;
```

```
#define MAX 200
```

```
class BigIntMultiplication {
```

```
private:
```

```
    int numA[MAX], numB[MAX], result[MAX];  
    int lenA, lenB;
```

```
public:
```

```
    BigIntMultiplication() {  
        memset(numA, 0, sizeof(numA));  
        memset(numB, 0, sizeof(numB));  
        memset(result, 0, sizeof(result));  
        lenA = lenB = 0;  
    }
```

```
    void storeNumber(int num, int arr[], int &length) {  
        while (num > 0) {  
            arr[length++] = num % 10;  
            num /= 10;  
        }  
    }
```

```
    void multiply(int A, int B) {  
        if (A == 0 || B == 0) {  
            cout << "0" << endl;  
            return;  
        }
```

```
        storeNumber(A, numA, lenA);  
        storeNumber(B, numB, lenB);
```

```
        for (int i = 0; i < lenB; i++) {  
            for (int j = 0; j < lenA; j++) {  
                result[i + j] += numB[i] * numA[j];  
                result[i + j + 1] += result[i + j] / 10;  
                result[i + j] %= 10;  
            }  
        }
```

```
        printResult();  
    }
```

```
    void printResult() {
```

```

        int lenResult = lenA + lenB;
        while (lenResult > 1 && result[lenResult - 1] == 0) lenResult--;
        for (int i = lenResult - 1; i >= 0; i--) cout << result[i];
        cout << endl;
    }
};

int main() {
    int A, B;
    cout << "Enter two integers: ";
    cin >> A >> B;
    BigIntMultiplication multiplier;
    cout << "Product: ";
    multiplier.multiply(A, B);
    return 0;
}

```

Output:

```

C:\Users\Polash01\Desktop\...
Enter two integers: 64 31
Product: 1984

Process returned 0 (0x0)   execution time : 34.914 s
Press any key to continue.
|

```