

NAME : ABDULLAH NADEEM

Sapp : 53422

Lab task 03

QUESTION # 01 :

```
#include <iostream>

using namespace std;

int main() {

    int rows=2, cols=2;

    int arr[rows][cols];


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

    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            cin >> arr[i][j];
        }
    }


    int sum = 0, multiplication = 1;

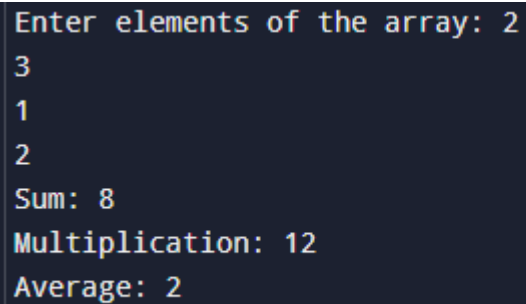
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            sum += arr[i][j];
            multiplication *= arr[i][j];
        }
    }

    double average = (double)sum / (rows * cols);

    cout << "Sum: " << sum << endl;
```

```
    cout << "Multiplication: " << multiplication << endl;
    cout << "Average: " << average << endl;
    return 0;
}
```

OUTPUT

A screenshot of a terminal window with a dark background. The text is as follows:

```
Enter elements of the array: 2
3
1
2
Sum: 8
Multiplication: 12
Average: 2
```

Question no 2

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

int main() {
    int x, y;
    cout << "Enter value of x: ";
    cin >> x;
    cout << "Enter value of y: ";
    cin >> y;

    int* ptrX = &x;
    int* ptrY = &y;

    // Swap values using pointers
    int temp = *ptrX;
```

```

*ptrX = *ptrY;
*ptrY = temp;

cout << "After swapping: " << endl;
cout << "x = " << x << ", y = " << y << endl;

return 0;
}

```

Output:

```

Enter value of x: 1
Enter value of y: 2
After swapping:
x = 2, y = 1

```

Question # 03

```

#include <iostream>

using namespace std;

int main() {

    int array[5];

    cout << "Enter 5 values: ";

    for (int i = 0; i < 5; i++) {

        cin >> array[i];

    }

    int largest = array[0], smallest = array[0];

    for (int i = 1; i < 5; i++) {

        if (array[i] > largest) {

            largest = array[i];

```

```
    }  
    if (array[i] < smallest) {  
        smallest = array[i];  
    }  
}  
  
cout << "Largest value: " << largest << endl;  
cout << "Smallest value: " << smallest << endl;  
  
return 0;  
}
```

Output:

```
Enter 5 values: 5  
6  
7  
8  
9  
Largest value: 9  
Smallest value: 5
```

Question # 04

```
#include <iostream>  
  
using namespace std;  
  
int main() {  
    double rainfall[12];
```

```

cout << "Enter rainfall for each of 12 months: ";

for (int i = 0; i < 12; i++) {
    cin >> rainfall[i];
}

double totalRainfall = 0;
for (int i = 0; i < 12; i++) {
    totalRainfall += rainfall[i];
}

double averageRainfall = totalRainfall / 12;

int highestMonth = 0, lowestMonth = 0;
for (int i = 1; i < 12; i++) {
    if (rainfall[i] > rainfall[highestMonth]) {
        highestMonth = i;
    }
    if (rainfall[i] < rainfall[lowestMonth]) {
        lowestMonth = i;
    }
}

cout << "Total rainfall: " << totalRainfall << endl;
cout << "Average monthly rainfall: " << averageRainfall << endl;
cout << "Highest rainfall in month: " << highestMonth + 1 << endl;
cout << "Lowest rainfall in month: " << lowestMonth + 1 << endl;

return 0;
}

```

Output:

```
Enter rainfall for each of 12 months: 21
22
232
4
45
78
25
45
79
44
25
4
Total rainfall: 415
Average monthly rainfall: 34.5833
Highest rainfall in month: 9
Lowest rainfall in month: 4
```

Question # 05

```
#include <iostream>

using namespace std;

int main() {

    int arr[3][3] = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}};

    int total = 0;

    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            total += arr[i][j];
        }
    }
}
```

```
double average = (double)total / (3 * 3);
```

```
cout << "Total: " << total << endl;
```

```
cout << "Average: " << average << endl;
```

```
int rowTotal[3] = {0, 0, 0};
```

```
for (int i = 0; i < 3; i++) {
```

```
    for (int j = 0; j < 3; j++) {
```

```
        rowTotal[i] += arr[i][j];
```

```
    }
```

```
}
```

```
int colTotal[3] = {0, 0, 0};
```

```
for (int i = 0; i < 3; i++) {
```

```
    for (int j = 0; j < 3; j++) {
```

```
        colTotal[j] += arr[i][j];
```

```
    }
```

```
}
```

```
int highestInRow[3] = {arr[0][0], arr[1][0], arr[2][0]};
```

```
for (int i = 0; i < 3; i++) {
```

```
    for (int j = 1; j < 3; j++) {
```

```
        if (arr[i][j] > highestInRow[i]) {
```

```
            highestInRow[i] = arr[i][j];
```

```
        }
```

```
    }
```

```
}
```

```
int highestInCol[3] = {arr[0][0], arr[0][1], arr[0][2]};  
for (int i = 1; i < 3; i++) {  
    for (int j = 0; j < 3; j++) {  
        if (arr[i][j] > highestInCol[j]) {  
            highestInCol[j] = arr[i][j];  
        }  
    }  
}
```

```
cout << "Row totals: ";  
for (int i = 0; i < 3; i++) {  
    cout << rowTotal[i] << " ";  
}  
cout << endl;
```

```
cout << "Column totals: ";  
for (int i = 0; i < 3; i++) {  
    cout << colTotal[i] << " ";  
}  
cout << endl;
```

```
cout << "Highest in each row: ";  
for (int i = 0; i < 3; i++) {  
    cout << highestInRow[i] << " ";  
}  
cout << endl;
```

```
cout << "Highest in each column: ";  
for (int i = 0; i < 3; i++) {
```



```
        cout << highestInCol[i] << " ";  
    }  
    cout << endl;  
  
    return 0;  
}
```

Output:

```
Total: 45  
Average: 5  
Row totals: 6 15 24  
Column totals: 12 15 18  
Highest in each row: 3 6 9  
Highest in each column: 7 8 9
```

Question # 06

```
#include <iostream>  
  
using namespace std;  
  
int main() {  
    int size;  
  
    cout << "Enter the size of the array: ";  
    cin >> size;  
  
    int* arr = new int[size];  
  
    cout << "Enter elements of the array: ";  
    for (int i = 0; i < size; i++) {  
        cin >> arr[i];  
    }  
}
```

```
int sumOfOdd = 0;

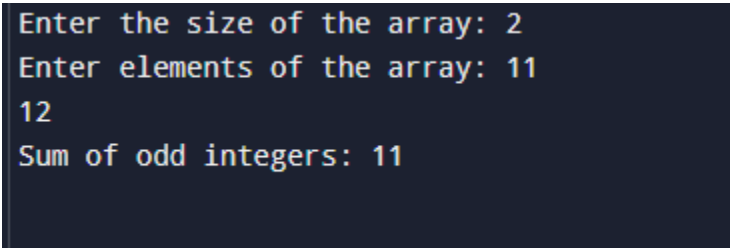
for (int i = 0; i < size; i++) {
    if (arr[i] % 2 != 0) {
        sumOfOdd += arr[i];
    }
}

cout << "Sum of odd integers: " << sumOfOdd << endl;

delete[] arr;

return 0;
}
```

Output:

A screenshot of a terminal window with a dark background. It shows the output of a C++ program. The first line is "Enter the size of the array: 2", the second is "Enter elements of the array: 11", the third is "12", and the fourth is "Sum of odd integers: 11".

```
Enter the size of the array: 2
Enter elements of the array: 11
12
Sum of odd integers: 11
```

Question # 07

```
#include <iostream>

using namespace std;

int main() {
```

```
int a;

cout<< "Enter the value of a";

    cin>>a;

int* ptrA = &a;


cout << "Value of a: " << a << endl;

cout << "Address of a: " << &a << endl;

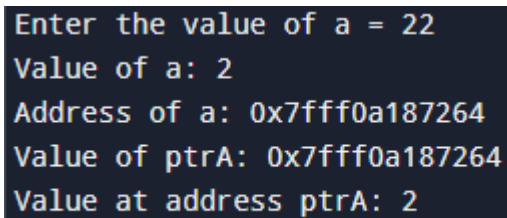
cout << "Value of ptrA: " << ptrA << endl;

cout << "Value at address ptrA: " << *ptrA << endl;


return 0;

}
```

Output:

A screenshot of a terminal window with a dark background and light-colored text. It shows the output of the C++ program: 'Enter the value of a = 22', 'Value of a: 2', 'Address of a: 0x7fff0a187264', 'Value of ptrA: 0x7fff0a187264', and 'Value at address ptrA: 2'.

```
Enter the value of a = 22
Value of a: 2
Address of a: 0x7fff0a187264
Value of ptrA: 0x7fff0a187264
Value at address ptrA: 2
```

Question # 08

```
#include <iostream>

using namespace std;

int main() {
```

```
int a=2, b=3;

int* ptrA = &a;

int* ptrB = &b;


cout << "Value of a: " << a << endl;
cout << "Value of b: " << b << endl;

cout << "Value of ptrA: " << ptrA << endl;
cout << "Value of ptrB: " << ptrB << endl;

cout << "Value at address ptrA: " << *ptrA << endl;
cout << "Value at address ptrB: " << *ptrB << endl;


return 0;
}
```

Output:

```
Value of a: 2
Value of b: 3
Value of ptrA: 0x7ffe3b424efc
Value of ptrB: 0x7ffe3b424ef8
Value at address ptrA: 2
Value at address ptrB: 3
```

Question # 09

```
#include <iostream>
```

```
using namespace std;
```

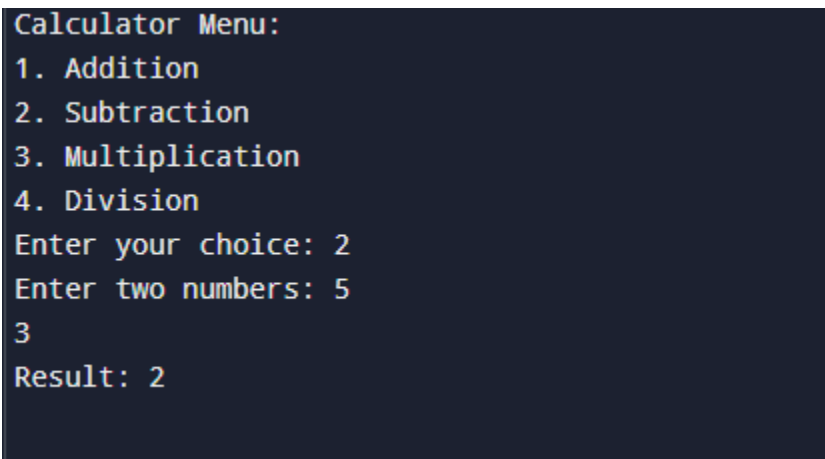
```
int main() {  
  
    int choice;  
  
    double num1, num2, result;  
  
  
    cout << "Calculator Menu:" << endl;  
    cout << "1. Addition" << endl;  
    cout << "2. Subtraction" << endl;  
    cout << "3. Multiplication" << endl;  
    cout << "4. Division" << endl;  
    cout << "Enter your choice: ";  
    cin >> choice;  
  
    cout << "Enter two numbers: ";  
    cin >> num1 >> num2;  
  
    switch (choice) {  
        case 1:  
            result = num1 + num2;  
            break;  
        case 2:  
            result = num1 - num2;  
            break;  
        case 3:  
            result = num1 * num2;  
            break;  
        case 4:  
            if (num2 != 0) {  
                result = num1 / num2;  
            } else {
```

```
        cout << "Error: Division by zero!" << endl;
        return 1;
    }
    break;
default:
    cout << "Error: Invalid choice!" << endl;
    return 1;
}

cout << "Result: " << result << endl;

return 0;
}
```

Output:



```
Calculator Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter your choice: 2
Enter two numbers: 5
3
Result: 2
```