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DSA LAB-TASKS

LAB-TASK1:

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

int main() {
    int arr[10] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};
    for (int i = 0; i < 10; i++)
    {
        cout << arr[i] << " ";
    }

    return 0;
}
```

```
1 2 3 4 5 6 7 8 9 10
C:\Users\Personal\source\repos\dsalabs\x64\Debug\dsalabs.exe (process 6688) exited with code 0 (0x0).
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the c
le when debugging stops.
Press any key to close this window . . .
```

LAB-TASK2:

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

int main() {
    int arr[10] = {1,2,3,4,5,6,7,8,9,10};
```

```cpp
    int number, index = -1;

    cout << "Enter the number to search: "<<endl;
    cin >> number;


    for (int i = 0; i < 10; i++) {
        if (arr[i] == number) {
            index = i;
            break;
        }
    }



    if (index != -1) {
        cout << "Number " << number << " found at index " << index << "." <<endl;
    }
    else {
        cout << "Number " << number << " not found in the array." <<endl;
    }
    return 0;
```

```
Enter the number to search:
3
Number 3 found at index 2.
```
}

LAB-TASK3:

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

int main() {
    int arr[11] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
    int n = 10;
    int element, index;


    cout << "Original array:" << endl;
    for (int i = 0; i < n; i++) {
        cout << arr[i] << " " << endl;
    }


    cout << "Enter the element to insert: " << endl;
    cin >> element;
    cout << "Enter the index at which to insert (0 to " << n << "): " << endl;
    cin >> index;


    if (index < 0 || index > n) {
        cout << "Invalid index!" << endl;
        return 1;
    }
```

```cpp
    for (int i = n; i > index; i--) {
        arr[i] = arr[i - 1];
    }


    arr[index] = element;
    n++;


    cout << "Array after insertion: " <<
endl;
    for (int i = 0; i < n; i++) {
        cout << arr[i] << " " << endl;
    }
    return 0;
}
```

```
2
3
4
5
6
7
8
9
10
Enter the element to insert:
1
Enter the index at which to insert (0 to 10):
0
Array after insertion:
1
1
2
3
4
5
6
7
8
9
10
```

LAB-TASK4:

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

int main() {
    int arr[10] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
    int n = 10;
    int index;
```

```cpp
    cin >> index;

    if (index < 0 || index >= n) {
        return 1;
    }

    for (int i = index; i < n - 1; i++) {
        arr[i] = arr[i + 1];
    }

    n--;

    for (int i = 0; i < n; i++) {
        cout << arr[i] << " ";
    }
    cout << endl;
    return 0;
}
```

```
4
1 2 3 4 6 7 8 9 10

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le when debugging stops.
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```

LAB-TASK5:

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

int main() {
    int arr[6];
    bool isPalindrome = true;

    for (int i = 0; i < 6; i++) {
        cin >> arr[i];
    }

    for (int i = 0; i < 3; i++) {
        if (arr[i] != arr[5 - i]) {
            isPalindrome = false;
            break;
        }
    }

    if (isPalindrome) {
        cout << "Palindrome" << endl;
    }
    else {
        cout << "Not Palindrome" << endl;
    }
    return 0;
}
```

```
1
1
1
1
11
1
Not Palindrome

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le when debugging stops.
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```

```
2
2
2
2
2
2
Palindrome

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le when debugging stops.
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```

LAB-TASK6:

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

int main() {
    int fact = 1;
```

```cpp
    int n = 0;
    for (int i = 1; i <=n; i++) {
        fact *= i;
    }
    return fact;
}
 int main() {
    int size;
    cin >> size;

    if (size < 1 || size > 20) {
        return 1;
    }

    int* arr = new int[size];
    int sum = 0;

    for (int i = 0; i < size; i++) {
        cin >> arr[i];
        if (arr[i] < 0 || arr[i] > 12) {
            delete[] arr;
            return 1;
        }
        sum += arr[i];
    }

    double average =
static_cast<double>(sum) / size;
    cout << "Average: " << average << endl;
    int factorial = 0;
```

```cpp
    for (int i = 0; i < size; i++) {
        cout << "Factorial of " << arr[i] <<
": " <<(arr[i]) << endl;
    }

    delete[] arr;
    return 0;
}
```

LAB-TASK7:

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

int main() {
    int size, key, index = -1;
    cin >> size;

    if (size <= 0) {
        return 1;
    }

    int* arr = new int[size];

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

    cin >> key;
```

```cpp
    for (int i = 0; i < size; i++) {
        if (arr[i] == key) {
            index = i;
            break;
        }
    }

    if (index != -1) {
        cout << "Found at index: " << index
<< endl;
    }
    else {
        cout << "Not found" << endl;
    }

    delete[] arr;
    return 0;
}
```

```
2
2
2
2
Found at index: 0

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le when debugging stops.
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```

LAB-TASK8:

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

int main() {
    int matrix[4][4];
    int value, row = -1, col = -1;

    for (int i = 0; i < 4; i++) {
        for (int j = 0; j < 4; j++) {
            cin >> matrix[i][j];
        }
    }

    cin >> value;

    for (int i = 0; i < 4; i++) {
        for (int j = 0; j < 4; j++) {
            if (matrix[i][j] == value) {
                row = i;
                col = j;
                break;
            }
        }
        if (row != -1) break;
    }

    if (row != -1 && col != -1) {
        cout << "Found at row: " << row <<
", column: " << col << endl;
```

```cpp
    }
    else {
        cout << "Not found" << endl;
    }
    return 0;
}
```

```
1 2 3 4 5 6
7 8 9 10 11
12 13 14 15
16 17 18 19
Not found

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le when debugging stops.
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```

```
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16
7
Found at row: 1, column: 2

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le when debugging stops.
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```

LAB-TASK9:

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

int main() {
    int matrix[3][3], transpose[3][3];

    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            cin >> matrix[i][j];
        }
    }

    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            transpose[j][i] = matrix[i][j];
        }
    }

    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            cout << transpose[i][j] << " ";
        }
        cout << endl;
    } cout << "Not found" << endl;

    return 0;
}
```

```
1 2 3
4 5 6
7 8 9
1 4 7
2 5 8
3 6 9
Not found

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le when debugging stops.
Press any key to close this window . . .
```