

Ramzy Izza Wardhana – 472698 – CSB – Lab Programming Assignment 4

Program 1

```
#include <iostream>

using namespace std;

int i, num_limit;
double sum, avg;

int main() {

    cout << "How many integers? ";
    cin >> num_limit;

    int inputArray[num_limit];

    cout << "Write the integers seperated by spaces: ";

    for(i = 0; i < num_limit; i++) {
        cin >> inputArray[i];
    }

    sum = 0;
    for(int j = 0; j < num_limit; j++) {
        sum += inputArray[j];
    }

    cout << "The average is " << sum / num_limit << endl;

    return 0;
}
```

```

1  #include <iostream>
2  using namespace std;
3
4  int i, num_limit;
5  double sum, avg;
6
7  int main() {
8
9      cout << "How many integers? ";
10     cin >> num_limit;
11
12     int inputArray[num_limit];
13
14     cout << "Write the integers seperated by spaces: ";
15
16     for(i = 0; i < num_limit; i++) {
17         cin >> inputArray[i];
18     }
19
20     sum = 0;
21     for(int j = 0; j < num_limit; j++) {
22         sum += inputArray[j];
23     }
24
25     cout << "The average is " << sum / num_limit << endl;
26
27     return 0;
28 }
29

```

input

```

How many integers? 7
Write the integers seperated by spaces: -100 4 7 1 -2 100 3
The average is 1.85714

...Program finished with exit code 0
Press ENTER to exit console.

```

input

```

How many integers? 5
Write the integers seperated by spaces: 83 -3 4 12 9
The average is 21

...Program finished with exit code 0
Press ENTER to exit console.

```

Program 2

```
#include <iostream>

using namespace std;

int i;
int array[500];
int number;

int main(){

    cout << "Insert a number : ";

    cin >> number;

    for (i = 0; number > 0; i++){
        array[i] = number % 2;
        number = number / 2;
    }

    cout << "The result of number " << number << " in binary is: " << endl;

    for (i = i - 1; i >= 0; i--){
        cout << array[i] << " ";
    }

    return 0;
}
```

```

1  #include <iostream>
2  using namespace std;
3
4  int i;
5  int array[500];
6  int number;
7
8  int main(){
9
10     cout << "Insert a number : ";
11
12     cin >> number;
13
14     for (i = 0; number > 0; i++){
15         array[i] = number % 2;
16         number = number / 2;
17     }
18
19     cout << "The result of number " << number << " in binary is: " << endl;
20
21     for (i = i - 1; i >= 0; i--){
22         cout << array[i] << " ";
23     }
24
25     return 0;
26 }

```

input

```

Insert a number : 13
The result of number 0 in binary is:
1 1 0 1

...Program finished with exit code 0
Press ENTER to exit console.

```

input

```

Insert a number : 17
The result of number 0 in binary is:
1 0 0 0 1

...Program finished with exit code 0
Press ENTER to exit console.

```

Program 3

```
#include <iostream>

#include <string.h>

using namespace std;

int length_num;

int main (){

    cout << "Insert the length of array: " << endl;
    cin >> length_num;

    int array1[length_num];
    int array2[length_num];

    cout << "\n";

    cout << "Enter elements of array 1: \n";
    for (int i=0; i < length_num; i++){
        cout << "Enter element a" << i+1 << " : ";
        cin >> array1[i];
    }
    cout << endl;
    cout << "Enter elements of array 2: \n";
    for (int j=0; j < length_num; j++){
        cout << "Enter element b" << j+1 << " : ";
        cin >> array2[j];
    }
```

```
cout << endl;
cout << "Intersection: \n";
int counter = 0;
int new_array[length_num];

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

    for (int j = 0; j < length_num; j++){

        if (array1[i] == array2[j]) {
            new_array[counter] = array2[j];
            counter++;
        }
    }
}

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

    cout << new_array[i] << endl;
}

return 0;

}
```

```

1  #include <iostream>
2  #include <string.h>
3  using namespace std;
4
5  int length_num;
6
7  int main (){
8
9      cout << "Insert the length of array: " << endl;
10     cin >> length_num;
11
12     int array1[length_num];
13     int array2[length_num];
14
15     cout << "\n";
16
17     cout << "Enter elements of array 1: \n";
18     for (int i=0; i < length_num; i++){
19         cout << "Enter element a" << i+1 << " : ";
20         cin >> array1[i];
21     }
22     cout << endl;
23     cout << "Enter elements of array 2: \n";
24     for (int j=0; j < length_num; j++){
25         cout << "Enter element b" << j+1 << " : ";
26         cin >> array2[j];
27     }
28
29     cout << endl;
30     cout << "Intersection: \n";
31     int counter = 0;
32     int new_array[length_num];
33
34     for (int i = 0; i < length_num; i++){
35         for (int j = 0; j < length_num; j++){
36             if (array1[i] == array2[j]) {
37                 new_array[counter] = array2[j];
38                 counter++;
39             }
40         }
41     }
42
43     for (int i = 0; i < counter; i++){
44         cout << new_array[i] << endl;
45     }
46
47     return 0;
48 }
49
50
51
52
53 }

```

Insert the length of array:

6

Enter elements of array 1:

Enter element a1 : 1

Enter element a2 : 2

Enter element a3 : 3

Enter element a4 : 5

Enter element a5 : 6

Enter element a6 : 8

Enter elements of array 2:

Enter element b1 : 4

Enter element b2 : 6

Enter element b3 : 1

Enter element b4 : 5

Enter element b5 : 2

Enter element b6 : 8

Intersection:

1

2

5

6

8

...Program finished with exit code 0

Press ENTER to exit console.

Program 4

```
#include <iostream>

using namespace std;

int matrix_1[2][2];
int matrix_2[2][2];
int new_matrix[2][2];

int main (){

    cout << "Enter elements of matrix 1: \n";
    for (int i=0; i < 2; i++){
        for (int j = 0; j < 2; j++){
            cout << "Enter element a" << i+1 << j+1 << " : ";
            cin >> matrix_1[i][j];
        }
    }
    cout << endl;

    cout << "Enter elements of matrix 2: \n";
    for (int i=0; i < 2; i++){
        for (int j = 0; j < 2; j++){
            cout << "Enter element b" << i+1 << j+1 << " : ";
            cin >> matrix_2[i][j];
        }
    }
    cout << endl;
```

```
cout << "Matrix 1: \n";

cout << "\t" << matrix_1[0][0] << "\t" << matrix_1[0][1] << endl;
cout << "\t" << matrix_1[1][0] << "\t" << matrix_1[1][1] << endl;

cout << "Matrix 2: \n";

cout << "\t" << matrix_2[0][0] << "\t" << matrix_2[0][1] << endl;
cout << "\t" << matrix_2[1][0] << "\t" << matrix_2[1][1] << endl;

new_matrix[0][0] = (matrix_1[0][0] * matrix_2[0][0]) + (matrix_1[0][1] * matrix_2[1][0]);
new_matrix[0][1] = (matrix_1[0][0] * matrix_2[0][1]) + (matrix_1[0][1] * matrix_2[1][1]);
new_matrix[1][0] = (matrix_1[1][0] * matrix_2[0][0]) + (matrix_1[1][1] * matrix_2[1][0]);
new_matrix[1][1] = (matrix_1[1][0] * matrix_2[0][1]) + (matrix_1[1][1] * matrix_2[1][1]);

cout << endl;
cout << "Output Matrix: \n";

cout << "\t" << new_matrix[0][0] << "\t" << new_matrix[0][1] << endl;
cout << "\t" << new_matrix[1][0] << "\t" << new_matrix[1][1] << endl;

return 0;
}
```

```

1  #include <iostream>
2  using namespace std;
3
4
5  int matrix_1[2][2];
6  int matrix_2[2][2];
7  int new_matrix[2][2];
8
9  int main (){
10
11     cout << "Enter elements of matrix 1: \n";
12     for (int i=0; i < 2; i++){
13         for (int j = 0; j < 2; j++){
14             cout << "Enter element a" << i+1 << j+1 << " : ";
15             cin >> matrix_1[i][j];
16         }
17     }
18     cout << endl;
19
20     cout << "Enter elements of matrix 2: \n";
21     for (int i=0; i < 2; i++){
22         for (int j = 0; j < 2; j++){
23             cout << "Enter element b" << i+1 << j+1 << " : ";
24             cin >> matrix_2[i][j];
25         }
26     }
27     cout << endl;
28
29     cout << "Matrix 1: \n";
30
31     cout << "\t" << matrix_1[0][0] << "\t" << matrix_1[0][1] << endl;
32     cout << "\t" << matrix_1[1][0] << "\t" << matrix_1[1][1] << endl;
33
34     cout << "Matrix 2: \n";
35
36     cout << "\t" << matrix_2[0][0] << "\t" << matrix_2[0][1] << endl;
37     cout << "\t" << matrix_2[1][0] << "\t" << matrix_2[1][1] << endl;
38
39     new_matrix[0][0] = (matrix_1[0][0] * matrix_2[0][0]) + (matrix_1[0][1] * matrix_2[1][0]);
40     new_matrix[0][1] = (matrix_1[0][0] * matrix_2[0][1]) + (matrix_1[0][1] * matrix_2[1][1]);
41     new_matrix[1][0] = (matrix_1[1][0] * matrix_2[0][0]) + (matrix_1[1][1] * matrix_2[1][0]);
42     new_matrix[1][1] = (matrix_1[1][0] * matrix_2[0][1]) + (matrix_1[1][1] * matrix_2[1][1]);
43
44     cout << endl;
45     cout << "Output Matrix: \n";
46     cout << "\t" << new_matrix[0][0] << "\t" << new_matrix[0][1] << endl;
47     cout << "\t" << new_matrix[1][0] << "\t" << new_matrix[1][1] << endl;
48
49     return 0;
50 }
51

```

Enter elements of matrix 1:

Enter element a11 : 2

Enter element a12 : 3

Enter element a21 : 4

Enter element a22 : 4

Enter elements of matrix 2:

Enter element b11 : 4

Enter element b12 : 3

Enter element b21 : -4

Enter element b22 : 6

Matrix 1:

2	3
---	---

4	4
---	---

Matrix 2:

4	3
---	---

-4	6
----	---

Output Matrix:

-4	24
----	----

0	36
---	----

...Program finished with exit code 0

Press ENTER to exit console.

Program 5

```
#include <iostream>

using namespace std;

int num_int;

int main(){

    cout << "How many integers? ";
    cin >> num_int;

    int array1[num_int];

    cout << "Write the integers separated by spaces: ";

    for (int i = 0; i < num_int; i++){
        cin >> array1[i];
    }

    cout << "The smallest missing positive integer is ";

    for (int i = 1; i <= 100; i++){
        int counter = 0;
        for (int j = 0; j < num_int; j++){

            if (array1[j] == i){
                counter = 1;
            }
        }
    }
```

```

    if (counter != 1){
        cout << i;
        break;
    }
}
return 0;
}

```

```

1  #include <iostream>
2  using namespace std;
3
4  int num_int;
5
6  int main(){
7
8      cout << "How many integers? ";
9      cin >> num_int;
10
11     int array1[num_int];
12
13     cout << "Write the integers separated by spaces: ";
14
15     for (int i = 0; i < num_int; i++){
16         cin >> array1[i];
17     }
18
19     cout << "The smallest missing positive integer is ";
20
21     for (int i = 1; i <= 100; i++){
22         int counter = 0;
23         for (int j = 0; j < num_int; j++){
24
25             if (array1[j] == i){
26                 counter = 1;
27             }
28         }
29         if (counter != 1){
30             cout << i;
31             break;
32         }
33     }
34     return 0;
35 }
36

```

input

```

How many integers? 5
Write the integers separated by spaces: -100 4 7 1 -2
The smallest missing positive integer is 2

...Program finished with exit code 0
Press ENTER to exit console.

```