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;
}
```

```cpp
#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;
}

```

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;
}
```

```cpp
#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;
}
```

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

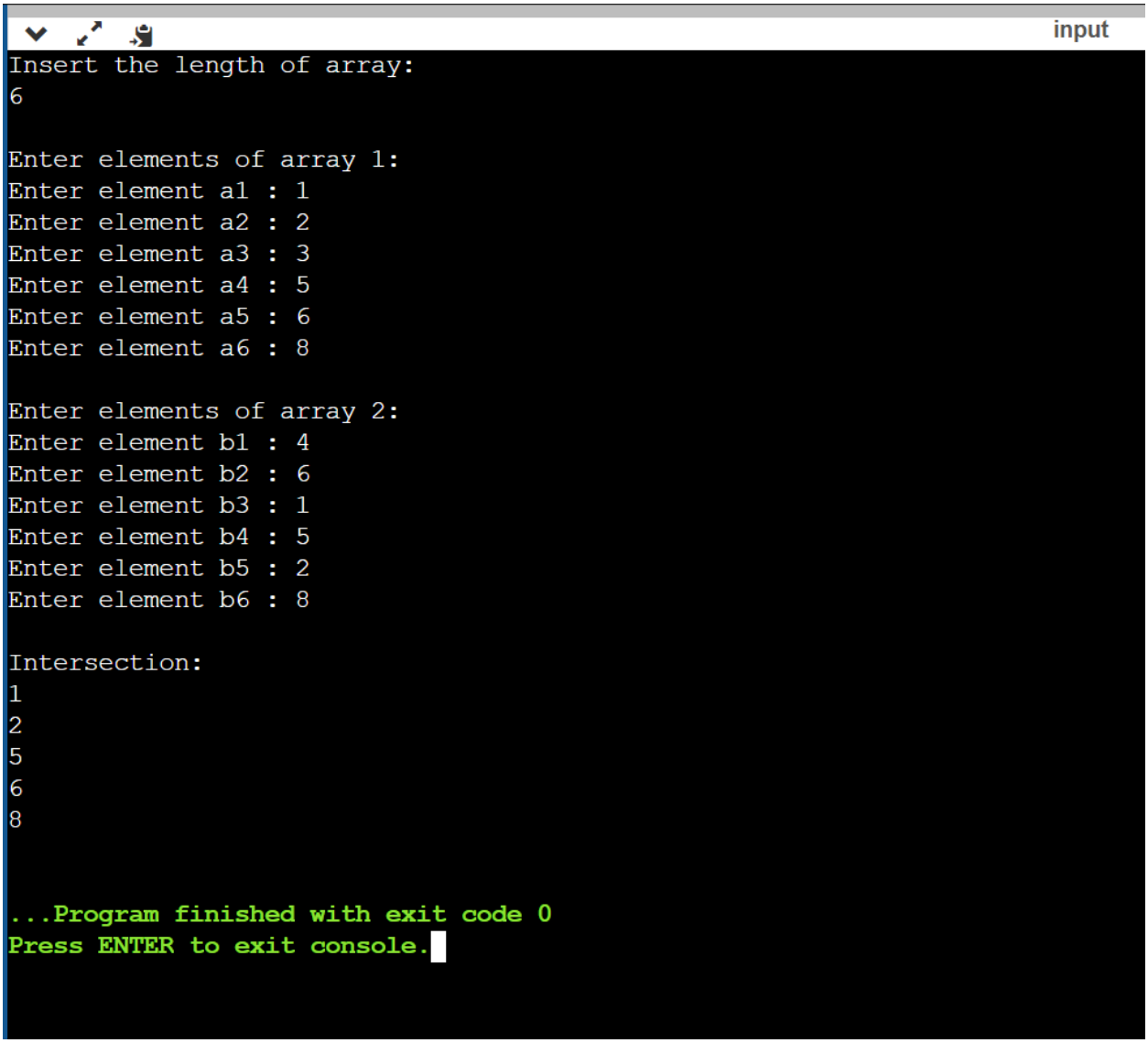
```
Insert a number : 17
The result of number 0 in binary is:
1 0 0 0 1

...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;

}
```

```cpp
#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;

}
```

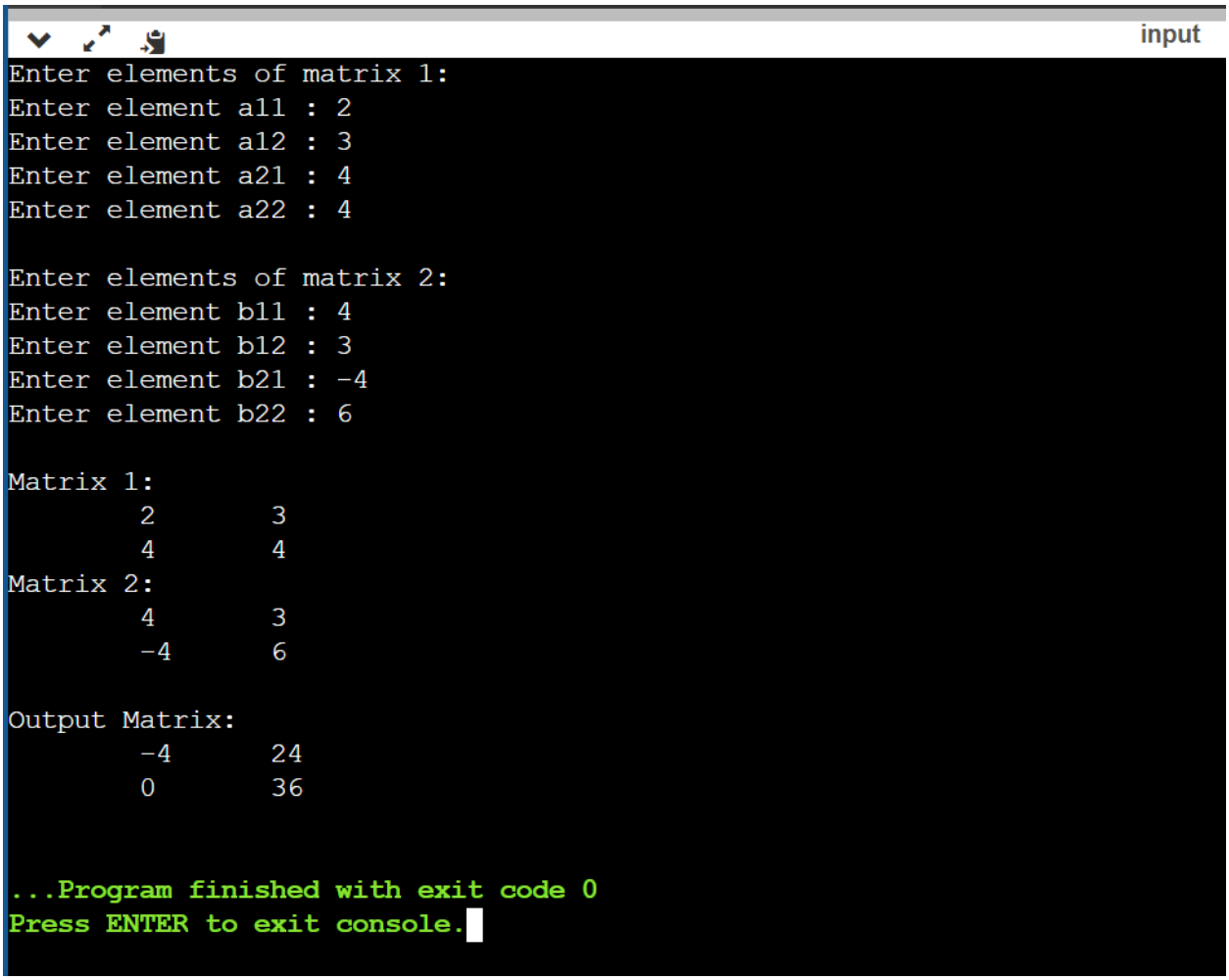

input
Insert the length of array:
6
Enter elements of array 1:
Enter element a1 : 1
Enter element a2 : 2
Enter element a3 : 3
Enter element a4 : 5
Enter element a5 : 6
Enter element a6 : 8
Enter elements of array 2:
Enter element b1 : 4
Enter element b2 : 6
Enter element b3 : 1
Enter element b4 : 5
Enter 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;
}
```

```cpp
#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;
}

```


input
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;
}
```

```cpp
#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;
}
```

```
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.
```