Program 1

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

//declare variables
int rows, i, j, space;

int main()
{

   //receive input from the users (how many rows)
  cout << "Enter number of rows: ";
  cin >> rows;

   //nested for loops to iterate from 1 until == rows (number of rows, input from users)
  for(i = 1; i <= rows; i++)
  {
    //for loop to output spaces before outputing *
    //spaces will decrease by 1 for each new line created
    for(space = i; space < rows; space++)
    {
      cout << setw(2) << "";
    }
    //for loop to output * after the spaces
    //* will increase by (2*i)-1 for each new line created
    //and will iterate until the condition is false or (j == 2*i - 1)
    for(j = 1; j <= (2 * i - 1); j++)
    {
      cout << " *";
    }
   // after the for loops above evaluated as false, then it will make
   // a new line and continues to output stars until (i == rows)
    cout << endl;
  }

  return 0;
}
```

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

//declare variables
int rows, i, j, space;

int main()
{

    //receive input from the users (how many rows)
   cout << "Enter number of rows: ";
   cin >> rows;

    //nested for loops to iterate from 1 until == rows (number of rows, input from users)
   for(i = 1; i <= rows; i++)
   {
      //for loop to output spaces before outputing *
      //spaces will decrease by 1 for each new line created
      for(space = i; space < rows; space++)
      {
         cout << setw(2) << "";
      }
      //for loop to output * after the spaces
      //* will increase by (2*i)-1 for each new line created
      //and will iterate until the condition is false or (j == 2*i - 1)
      for(j = 1; j <= (2 * i - 1); j++)
      {
         cout << " *";
      }
    // after the for loops above evaluated as false, then it will make
    // a new line and continues to output stars until (i == rows)
      cout << endl;
   }

   return 0;
}

```

```
Enter number of rows: 3
     *
   * * *
 * * * * *


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

```
Enter number of rows: 5
          *
        * * *
      * * * * *
    * * * * * * *
  * * * * * * * * *


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

```
Enter number of rows: 10
                    *
                  * * *
                * * * * *
              * * * * * * *
            * * * * * * * * *
          * * * * * * * * * * *
        * * * * * * * * * * * * *
      * * * * * * * * * * * * * * *
    * * * * * * * * * * * * * * * * *
  * * * * * * * * * * * * * * * * * * *


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

```
Enter number of rows: 9
                  *
                * * *
              * * * * *
            * * * * * * *
          * * * * * * * * *
        * * * * * * * * * * *
      * * * * * * * * * * * * *
    * * * * * * * * * * * * * * *
  * * * * * * * * * * * * * * * * *


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

Program 2

```
#include <iostream>
#include <iomanip> //library used for adjusting the spaces between numbers [setw()]
using namespace std;
//declare the each variables
   int num_max; //number from user to define the maximum multiplication table
   int i; //i used for the starting number (0)
   int firstrow, secondrow; //variables used for making the first and second rows

int main() {

   //receive inputs from the user
   cout << "Insert the maximum number to calculate the multiplication table: ";
   cin >> num_max;

   // make a nested loops to make the table
   for (i = 0; i <= num_max; i++) {
      //statement used to make the first row of the table
      if (i == 0) {
      cout << setw(5) << "    ";
      //for loop used to output the first row number from 0 till num_max
      for (firstrow = 0; firstrow <= num_max; firstrow++) {
         cout << " " << setw(2) << firstrow << " ";
      }
   cout << setw(4) << "  ";
   cout << endl;
   }

      //nested for loops to output the number on each columns
      for (int j = 0; j <= num_max; j++) {
         //if statement to output number on each rows until num_max
         if (j == 0) {
            cout << setw(3)<<  i << " -";
         }

         //output the number to fill each columns by multiplying x & y
         cout << setw(3) << (i * j) << " ";
      }

      //end of the line, repeats until the i = num_max
      cout << endl;
   }
   return 0;
}
```

```cpp
#include <iostream>
#include <iomanip> //library used for adjusting the spaces between numbers [setw()]
using namespace std;
//declare the each variables
    int num_max; //number from user to define the maximum multiplication table
    int i; //i used for the starting number (0)
    int firstrow, secondrow; //variables used for making the first and second rows

int main() {

    //receive inputs from the user
    cout << "Insert the maximum number to calculate the multiplication table: ";
    cin >> num_max;

    // make a nested loops to make the table
    for (i = 0; i <= num_max; i++) {
        //statement used to make the first row of the table
        if (i == 0) {
        cout << setw(5) << "    ";
        //for loop used to output the first row number from 0 till num_max
        for (firstrow = 0; firstrow <= num_max; firstrow++) {
            cout << " " << setw(2) << firstrow << " ";
        }
    cout << setw(4) << "  ";
    cout << endl;
    }

        //nested for loops to output the number on each columns
        for (int j = 0; j <= num_max; j++) {
            //if statement to output number on each rows until num_max
            if (j == 0) {
                cout << setw(3)<<  i << " -";
            }

            //output the number to fill each columns by multiplying x & y
            cout << setw(3) << (i * j) << " ";
        }

        //end of the line, repeats until the i = num_max
        cout << endl;
    }
    return 0;
}

```

```
Insert the maximum number to calculate the multiplication table: 10
      0   1   2   3   4   5   6   7   8   9  10
  0 -  0   0   0   0   0   0   0   0   0   0   0
  1 -  0   1   2   3   4   5   6   7   8   9  10
  2 -  0   2   4   6   8  10  12  14  16  18  20
  3 -  0   3   6   9  12  15  18  21  24  27  30
  4 -  0   4   8  12  16  20  24  28  32  36  40
  5 -  0   5  10  15  20  25  30  35  40  45  50
  6 -  0   6  12  18  24  30  36  42  48  54  60
  7 -  0   7  14  21  28  35  42  49  56  63  70
  8 -  0   8  16  24  32  40  48  56  64  72  80
  9 -  0   9  18  27  36  45  54  63  72  81  90
 10 -  0  10  20  30  40  50  60  70  80  90 100


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

```
Insert the maximum number to calculate the multiplication table: 3
      0   1   2   3
  0 -  0   0   0   0
  1 -  0   1   2   3
  2 -  0   2   4   6
  3 -  0   3   6   9


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

Program 3

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

//declare variables
int number, even, odd, base_num;

int main(){

   //receive input from the users
   cout << "Input any positive integer number: ";
   cin >> number;

   //sort the interger value whether it's a even or odd
   if (number % 2 == 0){
      //if even, we dont need to substract by 1
      even = number - 0;
      base_num = even;
   }
   else {
      //if odd, we need to substract by 1 so the value is less then
      //or equal to the input number (even)
      odd = number - 1;
      base_num = odd;
   }
   //use nested for loops to iterate the number from the biggest even number
   //till == 0
   for (int i = 0; i <= base_num; i++)
         {
               if (i % 2 == 0)
                     cout << base_num - i << " ";
         }

   return 0;
}
```

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

//declare variables
int number, even, odd, base_num;

int main(){

    //receive input from the users
    cout << "Input any positive integer number: ";
    cin >> number;

    //sort the interger value whether it's a even or odd
    if (number % 2 == 0){
        //if even, we dont need to substract by 1
        even = number - 0;
        base_num = even;
    }
    else {
        //if odd, we need to substract by 1 so the value is less then
        //or equal to the input number (even)
        odd = number - 1;
        base_num = odd;
    }
    //use nested for loops to iterate the number from the biggest even number
    //till == 0
    for (int i = 0; i <= base_num; i++)
    {
        if (i % 2 == 0)
            cout << base_num - i << " ";
    }

    return 0;
}
```

```
Input any positive integer number: 33
32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0

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

```
Input any positive integer number: 11
10 8 6 4 2 0

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

Program 4

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

//declare variables
int num1, num2;

int main() {

   //receive input from the user
   cout << "Enter two integers: ";
   cin >> num1 >> num2;

   int multiple = num2;
   //use nested for loops to iterate the output
   for (int i = 1; i <= num1; i++){

      //if the i == the multiples of 2nd integers then output *
      if (i == num2){
      cout << "* ";
      //after print out the *, we add the value of 2nd integer
      num2 = num2 + multiple;
      }
      //if the i != to multiples of 2nd integer, then
      //output reguler interger number
      else{
      cout << i << " ";
      }
   }

   return 0;
}
```