

Loop Logic Mastery

1. Right-Angled Triangle

2. Inverted Right-Angled Triangle

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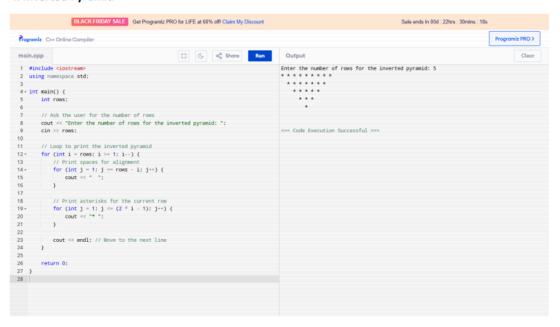
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The function of the inverted right-angled triangle:

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3. Full Pyramid

4. Inverted Pyramid



5. Hollow Pyramid

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   Programiz C++ Online Compiler
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   1 #include <iostream>
2 using namespace std;
                                                                                                                 Enter the number of rows for the hollow pyramid: 5
                                                                                                                ......
          // Ask the user for the number of rows
cout << "Enter the number of rows for the hollow pyramid: ";
cin >> rows;
 === Code Execution Successful ===
         // Print the hollow pyramid pattern

for (int j = 1: j << (2 * i - 1); j --) {

    if (j -- 1 || j -- (2 * i - 1) || i -- roms) {

        cout << ** *; // Print a star at the edges or the bottom row
    } else {

        cout << * *; // Print a space inside the pyramid
    }
}
           return 0;
32
```

6. Diamond

```
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Enter the number of rows for the diamond: S
 2 using namespace std;
3
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7. Square

8. Hollow Square

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9. Diagonal Line

10. Opposite Diagonal

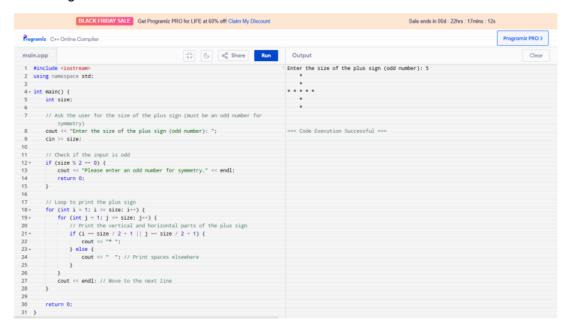


11. X Shape

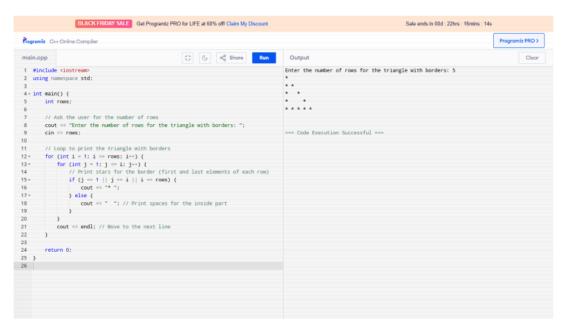
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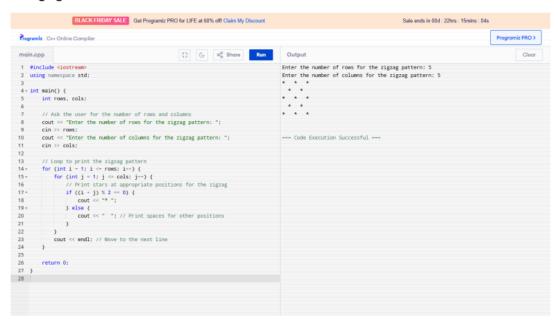
12. Plus Sign



13. Triangle with Borders



14. Zigzag Pattern



15. Sand Clock

17. Hollow Triangle



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Programiz C++ Ordino Compiler

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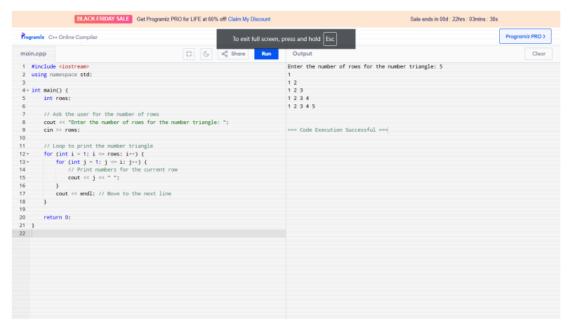
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18. Number Triangle



19. Inverted Number Triangle

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               Programiz C++ Online Compiler
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           1 #include <iostream>
2 using namespace std;
3
4 = int main() {
                                   // Ask the user for the number of rows
cout << "Enter the number of rows for the inverted number triangle: ";
cin >> rows;
=== Code Execution Successful ===
```

20. Number Pyramid

```
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   Programiz C++ Online Compiler
  main.cpp
                                                            α<sub>0</sub> Share Run Output
                                                                                                                                                                                       Clear
   1 #include <iostream>
2 using namespace std;
                                                                                                  Enter the number of rows for the number pyramid: 5
                                                                                                 1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
    3
4 - int main() {
          // Ask the user for the number of rows
cout << "Enter the number of rows for the number pyramid: ";
cin >> rows;
=== Code Execution Successful ===
```

21. Number Inverted Pyramid

```
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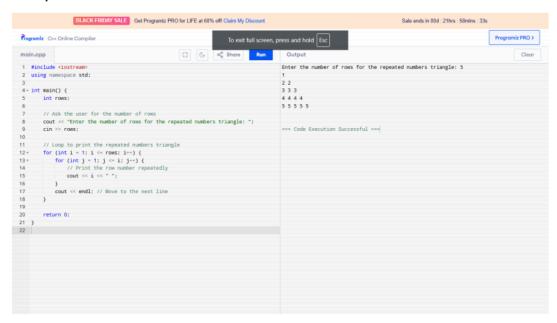
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**Clouds <1 ostream**

1 **Sinclude <1 ostream**
2 **using namespace std;
3 **Int sain() {
5 **Int rows;
6 **Clouds <1 ostream**
7 **/ Ask the user for the number of rows
8 **cut <1 ostream**
9 **Cut <1 ostream**
1 **Int sain() {
1 **Int sain(
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22. Repeated Numbers



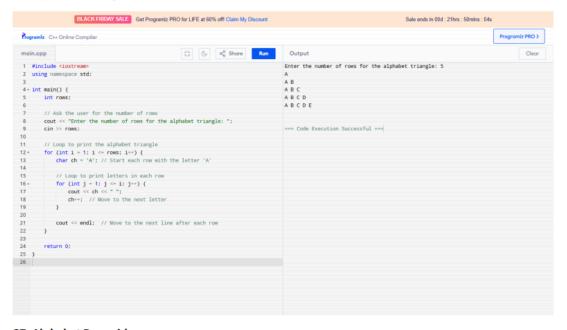
23. Numbers in Columns

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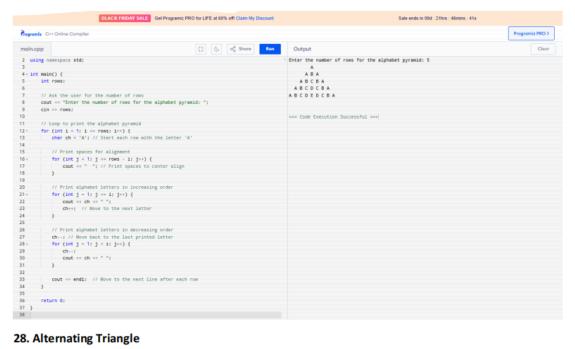
24. Floyd's Triangle

25. Pascal's Triangle

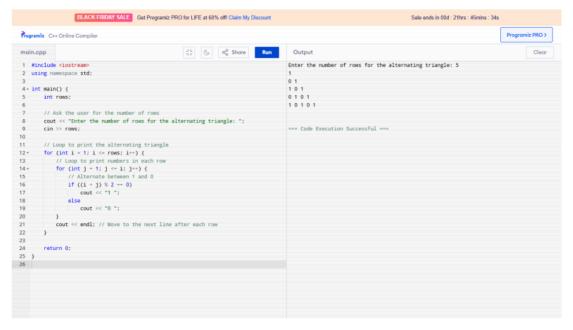
26. Alphabet Triangle



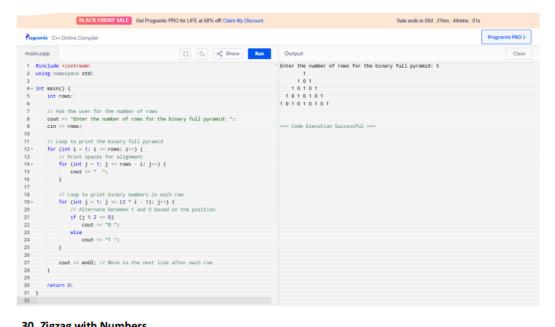
27. Alphabet Pyramid



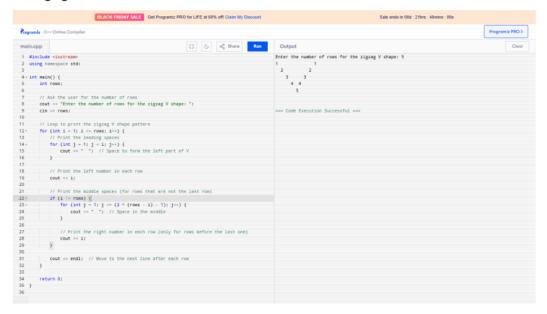
28. Alternating Triangle



29. Binary Pyramid

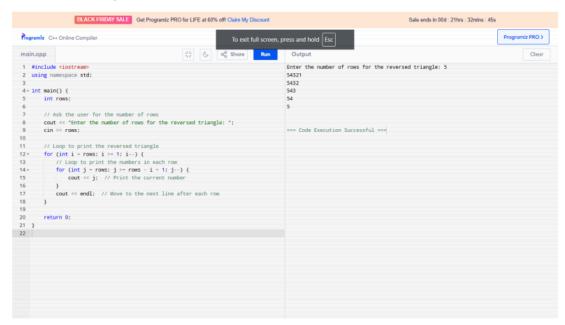


30. Zigzag with Numbers

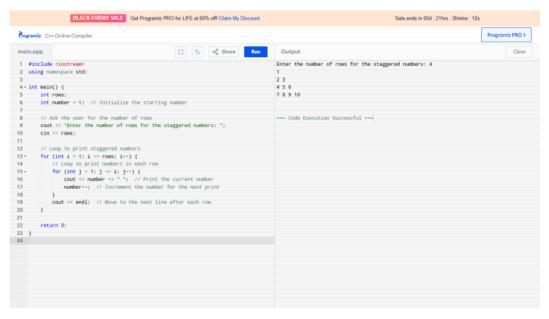


31. Number X Shape

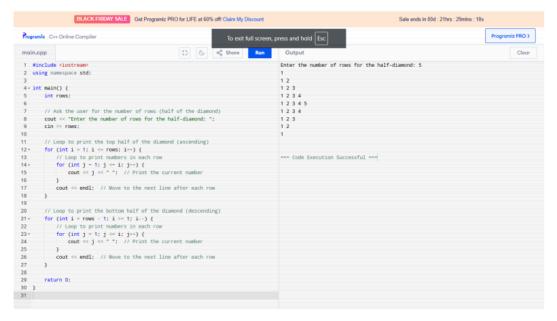
32. Reversed Triangle



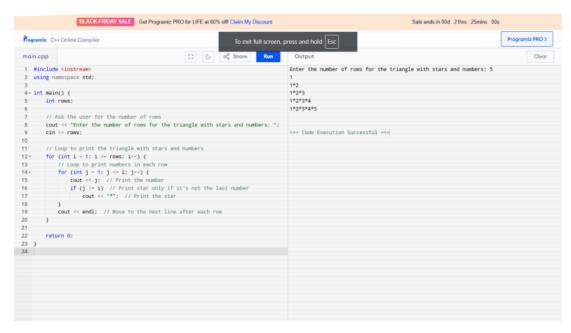
33. Staggered Numbers



34. Half-Diamond Numbers



35. Triangle with Stars and Numbers



36. Number Borders

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 main.cpp
                                                                                          Output
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  1 #include <iostream>
2 using namespace std;
                                                                                          Enter the size for the number border: 5
                                                                                          11111
                                                                                          10001
10001
   4 - int main() {
                                                                                          11111
       // Ask the user for the size of the square
cout << "Enter the size for the number border: ";
cin >> size;
                                                                                          === Code Execution Successful ===
       cout << endl; // Move to the next line after each row
}</pre>
```

37. Nested Loops

```
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38. Pyramid of Digits



39. Inverted Triangle Numbers

```
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                                                                                                                                                                                                                                                        Clear
  1 #include <iostream>
2 using namespace std;
                                                                                                                                     Enter the number of rows for the inverted triangle: 5
    3
4 = int main() {
                                                                                                                                     321
                                                                                                                                     4321
                                                                                                                                     54321
            // Ask the user for the number of rows for the inverted triangle
cout << "Enter the number of rows for the inverted triangle: ";
cin >> rows;
                                                                                                                                     === Code Execution Successful ===
          // Loop to print the inverted triangle

for (int i = 1; i <= rows; i -> ) {

    // Loop to print numbers in each row (decreasing from i to 1)

    for (int j = i; j >= 1; j -> ) {

        cout << j; // Print the current number

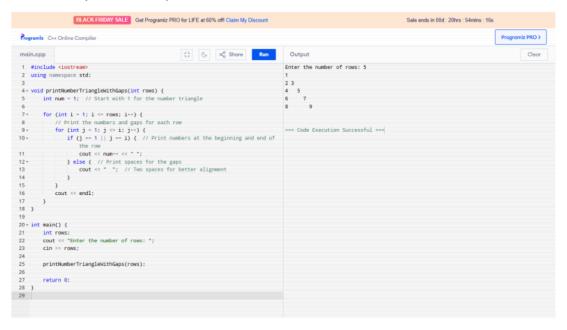
}
           cout << j; // Print the current number
}
cout << end1; // Move to the next line after each row
}</pre>
             return 0;
```

40. Spiral Matrix

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   main.cpp
                                                                                                                                                  Enter the size of the matrix (n x n): 4
1 2 3 4
12 13 14 5
11 16 15 6
10 9 8 7
1 #include <iostream>
2 #include <vector>
3 using namespace std;
    3 using namespace std;
4
5- void generateSpiralMatrix(int n) {
    6  // Create an empty n x n matrix
7  vector<vector<int>> matrix(n, vector<int>(n, 0));
                                                                                                                                                   === Code Execution Successful ===
           int left = 0, right = n - 1, top = 0, bottom = n - 1;
int num = 1;
           // Start filling the matrix from the center
while (left < right && top <= bottom) {
    // Traverse from left to right
    for (int i = left; i <= right; ++i) {
        matrix[top][i] - num++;</pre>
                 // Traverse downwards
for (int i = top; i <= bottom; ++i) {
    matrix[i][right] = num++;</pre>
                     right--;
                  // Traverse from right to left
for (int i = right; i >= left; --i) {
    matrix[bottom][i] - num++;
}
                     }
bottom--;
  31
32 // Traverse upwards
```

41. Number Pyramid with Gaps



42. Diamond Spiral



43. Checkerboard Numbers with Conditions



44. Snake Pattern

