

Assignments | Pattern Printing - 2 | Week 3

1. Print the following pattern

Input: n = 5

Output:

```
1
1 2 3
1 2 3 4 5
1 2 3 4 5 6 7
```

Solution:-

```
• #include <iostream>
• using namespace std;
•
• void printPattern(int n) {
•     for (int i = 1; i <= n; i++) {
•         int num = 1;
•         for (int j = 1; j <= i; j++) {
•             cout << num << " ";
•             num++;
•         }
•         cout << endl;
•     }
• }
•
• int main() {
•     int n = 5;
•     cout << "Input: n = " << n << endl;
•     cout << "Output:" << endl;
•     printPattern(n);
•     return 0;
• }
```

2. Print the following pattern

Input: n = 4

Output:

```
A
A B C
A B C D E
A B C D E F G
```

Solution:-

```
• #include <iostream>
• using namespace std;
•
• int main() {
•     int n;
•     cin >> n;
•     for(int i = 0; i < n; ++i) {
•         for(int j = 0; j < n-i-1; ++j) {
•             cout << " ";
•         }
•         for(int j = 0; j < 2 * i + 1; ++j) {
•             cout << (char)('A' + j) << " ";
•         }
•         cout << endl;
•     }
•     return 0;
• }
```

3. Print the following pattern

Input: n = 4

Output:

```
A
B A B
C B A B C
D C B A B C D
```

Solution:-

```
• #include <iostream>
• using namespace std;
•
• void printPattern(int n) {
•     for (int i = 0; i < n; i++) {
•         // Printing spaces
•         for (int j = 0; j < n - i - 1; j++) {
•             cout << " ";
•         }
•         // Printing characters in decreasing order
•         for (int j = i; j >= 0; j--) {
•             cout << char('A' + j);
•             if (j != 0) {
•                 cout << " ";
•             }
•         }
•         // Printing characters in increasing order
•         for (int j = 1; j <= i; j++) {
•             cout << " " << char('A' + j);
•         }
•         cout << endl;
•     }
• }
•
• int main() {
•     int n = 4;
•     printPattern(n);
•     return 0;
• }
```

4. Print the following pattern

Input: n = 4

Output:

```
A B C D E F G
A B C E F G
A B F G
A G
```

Solution:-

```
• #include <iostream>
• using namespace std;
•
• int main() {
•     int n;
•     cin >> n;
•     for (int i = 0; i < 2 * n - 1; ++i) {
•         cout << (char)('A' + i) << " ";
•     }
•     cout << endl;
•     for (int i = 1; i < n; ++i) {
```

```

•     for (int j = 0; j < n - i; ++j) {
•         cout << (char)('A' + j) << " ";
•     }
•     for (int j = 0; j < 2 * i - 1; ++j) {
•         cout << " ";
•     }
•     for (int j = 0; j < n - i; ++j) {
•         cout << (char)('A' + n + i + j - 1) << " ";
•     }
•     cout << endl;
• }
• return 0;
• }
•
•

```

5. Print the following pattern

Input: n = 4

Output:

```

1 2 3 4 3 2 1
1 2 3 3 2 1
1 2 2 1
1 1

```

• Solution:-

```

C++ assign4.cpp 5 x
C++ assign4.cpp 5 x
C++ assign4.cpp 5 x

1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int n;
6     cin >> n;
7
8     // Printing the first line of the pattern
9     for(int i = 0; i < n; ++i) {
10         cout << i + 1 << " ";
11     }
12     for(int i = n - 1; i >= 1; --i) {
13         cout << i << " ";
14     }
15     cout << endl;
16
17 // Printing the rest of the pattern
18 for(int i = 1; i < n; ++i) {
19     // Printing the numbers in decreasing order
20     for(int j = 0; j < n - i; ++j) {
21         cout << j + 1 << " ";
22     }
23     // Printing spaces
24     for(int j = 0; j < 2 * i - 1; ++j) {
25         cout << " ";
26     }
27     // Printing the numbers in decreasing order
28     for(int j = n - i; j >= 1; --j) {
29         cout << j << " ";
30     }
31     cout << endl;
32 }
33
34 return 0;
35
36
37
38
39
40
41
42
43
44

PROBLEMS 5 OUTPUT DEBUG CONSOLE TERMINAL PORTS
sushantshekhars@sushants-Air c++ % cd "/Users/sushantshekhars/Desktop/...sushant coding/c++/" && g++ assign4.cpp -o assign4
4
1 2 3 4 3 2 1
1 2 3 3 2 1
1 2 2 1
1 1
sushantshekhars@sushants-Air c++ %

```

6. Print the following pattern

Input : n = 5

Output:

```

* *
* *

```

* *
 * *
 *

```

1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int n;
6     cin >> n;
7
8     // Printing entire pattern except the bottommost star
9     for(int i = 0; i < n-1; ++i) {
10        for(int j = 0; j < i; ++j) {
11            cout << " ";
12        }
13        cout << "*";
14        int m = 2 * (n - i - 1);
15        for(int j = 0; j < m-1; ++j) {
16            cout << " ";
17        }
18        cout << "*" << endl;
19    }
20
21    // Printing last star
22    for(int i = 0; i < n-1; ++i) {
23        cout << " ";
24    }
25    cout << "*";
26
27    return 0;
28 }
29
30
31

```

```

sushantshekh@Air c++ % cd "/Users/sushantshekh/Desktop/....sushant coding/c++/" && g++ assign4.cpp -o assign4
&& ./assign4
4
* *
* *
* *
* *
*

```

7. Print the following pattern
 Sample Input : m = 4, n = 6
 Sample Output :

*
 * *
 * *
 * *
 * *
 * *
 *

Solution:
 #include <iostream>
 using namespace std;

```

int main() {
    int m, n;
    cin >> m >> n;

```

```

// Printing the upper part of the pattern
for (int i = 0; i < m; ++i) {
    // Printing leading spaces
    for (int j = 0; j < m - i - 1; ++j)
        cout << " ";

```

```

// Printing the star
cout << "*";

```

```

// Printing spaces between stars
for (int j = 0; j < 2 * i - 1; ++j)
    cout << " ";

// Printing the second star (if not the first line)
if (i > 0)
    cout << "*";

cout << endl;
}

// Printing the lower part of the pattern
for (int i = m - 2; i >= 0; --i) {
    // Printing leading spaces
    for (int j = 0; j < m - i - 1; ++j)
        cout << " ";

    // Printing the star
    cout << "*";

    // Printing spaces between stars
    for (int j = 0; j < 2 * i - 1; ++j)
        cout << " ";

    // Printing the second star
    cout << "*";

    cout << endl;
}

return 0;
}

```

8. Print the following pattern
Sample
Input : n = 4
Output :

```

    1
  2 2
3    3
4      4

```

9. Print the following pattern
Sample
Input : n = 5
Output :

```

*
***
* * *
* * *
* * *
*****
* * *
* * *
* * *

```

The screenshot shows a C++ IDE with a file explorer on the left, a code editor in the center, and a terminal at the bottom. The code editor displays the C++ program for printing a diamond pattern. The terminal shows the command to compile and run the program, followed by the output of the program, which matches the pattern shown in the previous blocks.

```

C++ assignment3.cpp assignment4.cpp X
1 #include <iostream>
2 using namespace std;
3 int main() {
4     int n;
5     cin >> n;
6     for(int i = 0; i < n; ++i) {
7         cout << " ";
8     }
9     cout << " " << endl;
10    for(int i = 1; i <= n; ++i) {
11        for(int j = 0; j < n - i; j++) {
12            cout << " ";
13        }
14        cout << i;
15        for(int j = 0; j < 2 * i - 1; ++j) {
16            cout << " ";
17        }
18        if (i != 1) cout << i;
19        cout << endl;
20    }
21    return 0;
22 }
23
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
sushantshekar@sushants-Air c++ % cd "/Users/sushantshekar/Desktop/..." && g++ assign4.cpp -o assign4
&& "/Users/sushantshekar/Desktop/..."sushant coding/c++/"assign4
    1
  2 2
3    3
4      4
sushantshekar@sushants-Air c++ %
Ln 19, Col 22 Spaces: 4 UTF-8 LF C++ Go Live Mac Prettier

```

*

Solution:-

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

```
int main() {
    int n;
    cout << "Enter the number of rows (odd number): ";
    cin >> n;
```

```
    // Upper half of the diamond
    for(int i = 1; i <=n; i++) {
        // Print leading spaces
        for(int j = 1; j <= n ;j++) {
            if(i+j==n+1) cout<<"*";
            else if(j==n||i==n) cout<<"*";
            else cout<<" ";
        }
        // Print stars
        for(int j = 1; j <=n-1; j++) {
            if (j == i-1) cout<<"*";
            else if(j==n||i==n) cout<<"*";
            cout << "*";
```

ELSE

```
        cout << " ";
    }
    cout << endl;
}
n--;
// Lower half of the diamond
for(int i = 1; i <=n; i++) {
    cout<<" ";
    for(int j = 1; j <=n; j++) {
        if (i==j)
            cout << "*";
        else if(j==n||i==n) cout<<"*";
        else
            cout << " ";
    }
    for (int j=1; j<=n-1;j++){
        if(i+j==n) cout<<"*";
        else cout<<" ";
    }
    cout << endl;
}
```

```
    return 0;
```

}

10. Print the following pattern

Input : n = 4

Output :

```
* *
** **
*** ***
*****
*****
*** ***
** **
* *
```

• Solution:-

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

```
void printPattern(int n) {
    // Upper part of the pattern
    for (int i = 1; i <= n; ++i) {
        for (int j = 1; j <= i; ++j)
            cout << "*";
        for (int j = i + 1; j <= n; ++j)
            cout << " ";
        for (int j = i + 1; j <= n; ++j)
            cout << " ";
        for (int j = 1; j <= i; ++j)
            cout << "*";
        cout << endl;
    }
```

```
    // Lower part of the pattern
    for (int i = n - 1; i >= 1; --i) {
        for (int j = 1; j <= i; ++j)
            cout << "*";
        for (int j = i + 1; j <= n; ++j)
            cout << " ";
        for (int j = i + 1; j <= n; ++j)
            cout << " ";
        for (int j = 1; j <= i; ++j)
            cout << "*";
        cout << endl;
    }
}
```

```
int main() {
    int n = 4;
    printPattern(n);
    return 0;
}
```

11. Print the following pattern
Input: n = 4

Output:

```
*** **
** **
* *
** **
*** **
*****
```

```
1 #include <iostream>
2 using namespace std;
3
4 void printPattern(int n) {
5     // Upper triangle
6     for (int i = n; i >= 1; i--) {
7         for (int j = 1; j <= i; j++)
8             cout << " * ";
9         cout << " \n";
10        for (int j = 1; j <= 2 * (n - i); j++)
11            cout << " ";
12        for (int j = 1; j <= i; j++)
13            cout << " * ";
14        cout << endl;
15    }
16
17    // Lower triangle
18    for (int i = 2; i <= n; i++) {
19        for (int j = 1; j <= i; j++)
20            cout << " * ";
21        for (int j = 1; j <= 2 * (n - i); j++)
22            cout << " ";
23        for (int j = 1; j <= i; j++)
24            cout << " * ";
25        cout << endl;
26    }
27
28    int main() {
29        int n = 4;
30        printPattern(n);
31    }
32
33 }
```

```
sushantshekar@sushants-Air c++ % cd "/Users/sushantshekar/Desktop/....sushant coding/c++/" && g++ assign4.cpp -o assign4 && "/Users/sushant shekar/Desktop/....sushant coding/c++/"assign4
*** **
** **
* *
** **
*** **
*****
sushantshekar@sushants-Air c++ %
```