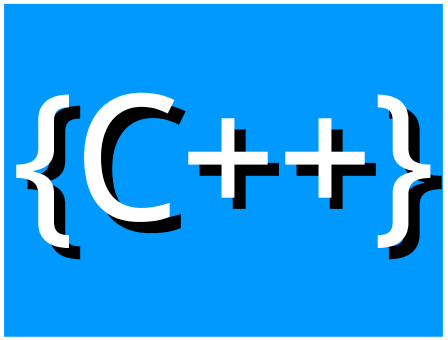
Control Statements

Week 3
Nested for-loops



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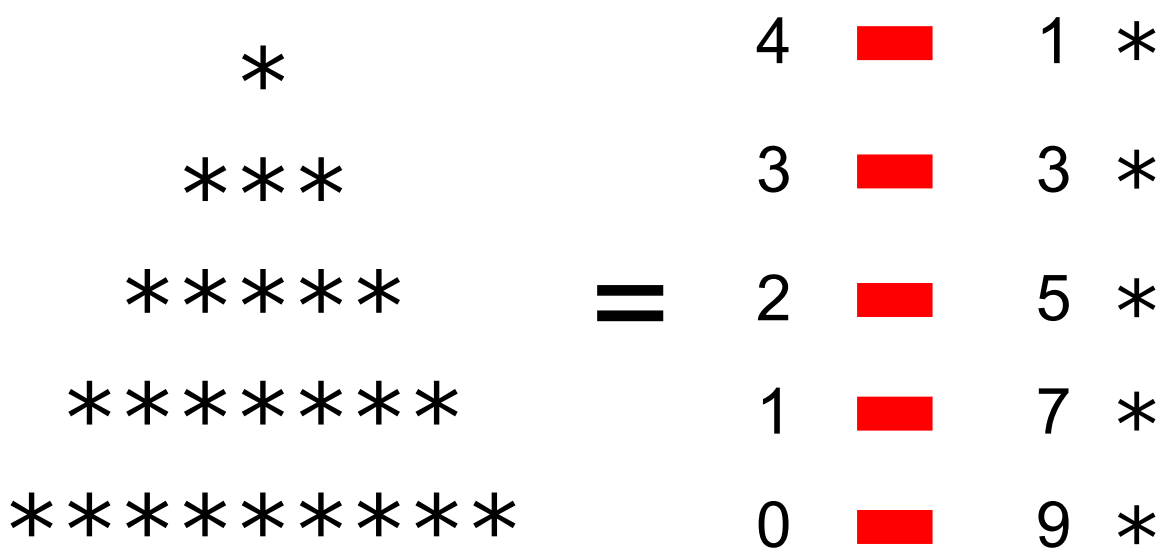
Example

- Use asterisks(*) to draw a regular triangle

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

Thought

- Find out how the graph changes



= space

First Step

- Output the sequences of the total amounts of asterisks for each line

```
#include <iostream>
using namespace std;
int main(int argc, const char *argv[])
{
    int height = 0;
    cin >> height;
    cout << endl;
    for (int i = 1; i < 2 * height; i+=2) {
        cout << i << endl;
    }
    return 0;
}
```

```
1
3
5
7
9
```

Second Step

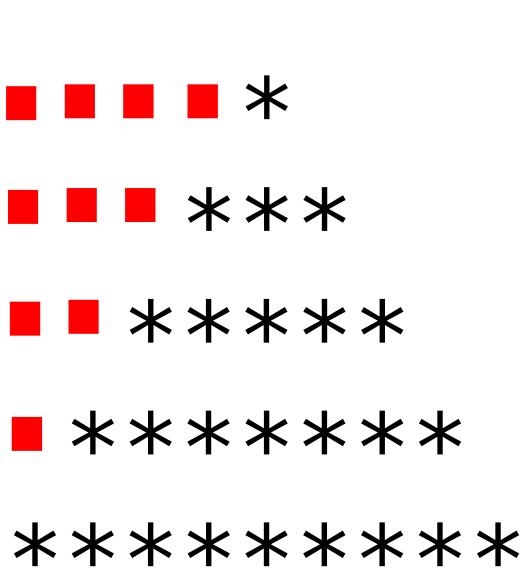
- Ignore spaces, just draw a right triangle

```
#include <iostream>
using namespace std;
int main(int argc, const char *argv[])
{
    int height = 0;
    cin >> height;
    cout << endl;
    for (int i = 1; i < 2 * height; i+=2) {
        for ( int j = 1; j <= i; j++ ) {
            cout << "*";
        }
        cout << endl;
    }
    return 0;
}
```

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

Last Step

- Find the pattern



=

■	*
4	1
3	3
2	5
1	7
0	9

Last Step

- Add the condition to print spaces

```
#include <iostream>
using namespace std;
int main(int argc, const char *argv[])
{
    int height = 0;
    cin >> height;
    cout << endl;
    for (int i = 1; i < 2 * height; i+=2) {
        for ( int m = height - 1 - i/2; m > 0; m--) {
            cout << " ";
        }
        for ( int j = 1; j <= i; j++ ) {
            cout << "*";
        }
        cout << endl;
    }
    return 0;
}
```

■ ∗

4 1

3 3

2 5

1 7

0 9

Week 3 Assignment

- Write a C++ program, let a user to input daily sales of pencils and ballpoint pens for the first four days, and use these data to draw a vertical bar graph.
- You can use asterishks(*) or plus(+) to draw graphs.
- You should check the validity of the input values
  - Must be in the range 0~5
- You should check the validity of total daily sales
  - Must be in the range 0~5
- Use nested for-loops and condition control statements to solve this problem

Input Format

- Input Example

```
Please input the daily sales of pencils for the
first four days( use a space to separate each
character )
2 1 3 1

Please input the daily sales of ballpoint pens
for the first four days( use a space to separate
each character )
3 1 1 2
```

Input and Output Format

- Constraint
  You should not use two dimension array

- Output Example

```
* daily sales of pencils
+ daily sales of ballpoint pens
```

Total daily sales <= 5

```
*
*   *
+   * *
+ * * +
+ + + +
1 2 3 4
```

space