

# Patterns

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

```
★  
★★  
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★★★★  
★★★★★  
★★★★★★
```

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

```
int n = 5;  
for (int i = 0; i < n; i++) {  
    for (int j = 0; j < n; j++) {  
        cout << "* ";  
    }  
    cout << endl;  
}
```

```
for (int i = 0; i < n; i++) {  
    for (int j = 0; j <= i; j++) {  
        cout << "* ";  
    }  
    cout << endl;  
}
```

```
for (int i = 0; i < n; i++) {  
    for (int j = i; j < n; j++) {  
        cout << "* ";  
    }  
    cout << endl;  
}
```

```

      ★
    ★ ★ ★
  ★ ★ ★ ★ ★
★ ★ ★ ★ ★ ★ ★

```

```

for (int i = 0; i < n; i++) {
    for (int j = i; j < n; j++) {
        cout << " ";
    }
    for (int j = 0; j <= i; j++) {
        cout << "* ";
    }
    for (int j = 0; j < i; j++) {
        cout << "* ";
    }
    cout << endl;
}

```

```

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★ ★ ★
★

```

```

for (int i = 0; i < n; i++) {
    for (int j = 0; j <= i; j++) {
        cout << " ";
    }
    for (int j = i; j < n-1; j++) {
        cout << "* ";
    }
    for (int j = i; j < n; j++) {
        cout << "* ";
    }
    cout << endl;
}

```

```

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★

```

```

for (int i = 0; i < n-1; i++) {
    for (int j = i; j < n; j++) {
        cout << " ";
    }
    for (int j = 0; j <= i; j++) {
        cout << "* ";
    }
    for (int j = 0; j < i; j++) {
        cout << "* ";
    }
    cout << endl;
}

for (int i = 0; i < n; i++) {
    for (int j = 0; j <= i; j++) {
        cout << " ";
    }
    for (int j = i; j < n-1; j++) {
        cout << "* ";
    }
    for (int j = i; j < n; j++) {
        cout << "* ";
    }
    cout << endl;
}

```

**1**  
**12**  
**123**  
**1234**  
**12345**

```
for (int i = 0 ; i < n; i++) {  
    for (int j = 0, p = 1; j <= i; j++) {  
        cout << p++ << " ";  
    }  
    cout << endl;  
}
```

**1**  
**22**  
**333**  
**4444**  
**55555**

```
for (int i = 0, p = 1 ; i < n; i++, p++) {  
    for (int j = 0; j <= i; j++) {  
        cout << p << " ";  
    }  
    cout << endl;  
}
```

**1**  
**0 1**  
**1 0 1**  
**0 1 0 1**  
**1 0 1 0 1**

```
for (int i = 0; i < n; i++) {  
    for (int j = 0; j <= i; j++) {  
        if ((i + j) % 2 == 0) {  
            cout << "1 ";  
        } else {  
            cout << "0 ";  
        }  
    }  
    cout << endl;  
}
```

```

1      1
12     21
123    321
12344321

```

```

for (int i = 0; i < n-1; i++) {
    for (int j = 0, p = 1; j <= i; j++) {
        cout << p++ << " ";
    }
    for (int j = i; j < n-2; j++) {
        cout << " ";
    }
    for (int j = i; j < n-2; j++) {
        cout << " ";
    }
    for (int j = 0, p = i+1; j <= i; j++, p--) {
        cout << p << " ";
    }
    cout << endl;
}

```

```

12345
1234
123
12
1

```

```

for (int i = 0; i < n; i++) {
    for (int j = i, p = 1; j < n; j++) {
        cout << p++ << " ";
    }
    cout << endl;
}

```

```

1
2 3
4 5 6
7 8 9 10
11 12 13 14 15

```

```

int n = 5, p = 1;
for (int i = 0; i < n; i++) {
    for (int j = 0; j <= i; j++, p++) {
        cout << p << " ";
    }
    cout << endl;
}

```

**A**

**AB**

**ABC**

**ABCD**

**ABCDE**

```
for (int i = 0; i < n; i++) {  
    for (int j = 0, p = 'A'; j <= i; j++) {  
        cout << char(p++) << " ";  
    }  
    cout << endl;  
}
```

**A**

**BB**

**CCC**

**DDDD**

**EEEE**

```
for (int i = 0, p = 'A'; i < n; i++, p++) {  
    for (int j = 0; j <= i; j++) {  
        cout << char(p) << " ";  
    }  
    cout << endl;  
}
```

**A**

**ABA**

**ABCBA**

**ABCD CBA**

```
for (int i = 0; i < n; i++) {  
    for (int j = i; j < n; j++) {  
        cout << " ";  
    }  
    int p = 'A';  
    for (int j = 0; j <= i; j++) {  
        cout << char(p++) << " ";  
    }  
    p-=2;  
    for (int j = 0; j < i; j++) {  
        cout << char(p--) << " ";  
    }  
    cout << endl;  
}
```

```

E
D E
C D E
B C D E
A B C D E

```

```

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

```

```

for (int i = 0, k = 'E'; i < n; i++, k--) {
    int p = k;
    for (int j = 0; j <= i; j++) {
        cout << (char)p++ << " ";
    }
    cout << endl;
}

```

```

for (int i = 0; i < n; i++) {
    for (int j = 0; j < n; j++) {
        if (i == 0 || j == 0 || i == n-1 || j == n-1) {
            cout << "* ";
        } else {
            cout << " ";
        }
    }
    cout << endl;
}

```

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

```
int n = 7;
for (int i = 0; i < n; i++) {
    for (int j = 0; j < n; j++) {
        if (i == 0 || j == 0 || i == n-1 || j == n-1) {
            cout << "4 ";
        } else if (i == 1 || j == 1 || i == n-2 || j == n-2) {
            cout << "3 ";
        } else if (i == 2 || j == 2 || i == n-3 || j == n-3) {
            cout << "2 ";
        } else if (i == 3 || j == 3 || i == n-4 || j == n-4) {
            cout << "1 ";
        } else {
            cout << " ";
        }
    }
    cout << endl;
}
return 0;
```