

## Python pattern problems

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### 1) Right-angle triangle of stars

#### Code

```
n = 5
for i in range(1, n+1):
    print("*" * i)
```

#### Output

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

---

### 2) Inverted right-angle triangle of stars

#### Code

```
n = 5
for i in range(n, 0, -1):
    print("*" * i)
```

#### Output

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

---

### 3) Number triangle (1..i)

#### Code

```
n = 5
```

```
for i in range(1, n+1):  
    print(" ".join(str(j) for j in range(1, i+1)))
```

#### **Output**

```
1  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5
```

---

#### **4) Centered star pyramid**

##### **Code**

```
n = 5  
for i in range(1, n+1):  
    print(" "*(n-i) + "*" * i)
```

##### **Output**

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

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#### **5) Inverted centered star pyramid**

##### **Code**

```
n = 5  
for i in range(n, 0, -1):  
    print(" "*(n-i) + "*" * i)
```

##### **Output**

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

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## 6) Floyd's triangle

### Code

```
n = 5
```

```
num = 1
```

```
for i in range(1, n+1):
```

```
    row = []
```

```
    for _ in range(i):
```

```
        row.append(str(num))
```

```
        num += 1
```

```
    print(" ".join(row))
```

### Output

```
1
```

```
2 3
```

```
4 5 6
```

```
7 8 9 10
```

```
11 12 13 14 15
```

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## 7) Pascal's triangle (first n rows)

### Code

```
from math import comb
```

```
n = 5
```

```
for i in range(n):
```

```
    print(" "*i + " ".join(str(comb(i, j)) for j in range(i+1)))
```

### Output

```
1
```

```
1 1
1 2 1
1 3 3 1
1 4 6 4 1
```

---

### 8) Hollow square of stars (n x n)

#### Code

```
n = 5
for i in range(1, n+1):
    if i == 1 or i == n:
        print("* " * n)
    else:
        print("* " + " "*(n-2) + "**")
```

#### Output

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

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### 9) Diamond pattern (top+middle+bottom)

#### Code

```
n = 5
# upper including middle
for i in range(1, n+1):
    print(" "*(n-i) + "*" * i)
# lower
for i in range(n-1, 0, -1):
    print(" "*(n-i) + "*" * i)
```

## Output

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

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## 10) Butterfly pattern

### Code

```
n = 5  
  
# top half  
for i in range(1, n+1):  
    print("*"*i + " "*(2*(n-i)) + "*"*i)  
  
# bottom half  
for i in range(n, 0, -1):  
    print("*"*i + " "*(2*(n-i)) + "*"*i)
```

### Output

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

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