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1). Print 1 2 3 4.
1 2 3 4
1 2 3 4.
1 2 3 4.

```
int main(){
int n; cin>>n;
    for (int i=1; i<=n; i++){
        for(int j=1; j<=n; j++){
            cout<< j <<" ";
        }
        cout<<endl;
    }
    return 0;
}.
```

2). Print 1 2 3
4 5 6
7 8 9.

```
int main(){
    int n;
    cin>>n;
    int toPrint=1;
    for (int i=1; i<=n; i++){
        for (int j=1; j<=n; j++){
            cout<< toPrint<<" ";
            toPrint++;
        }
        cout <<endl;
    }
    return 0;
}
```

Signature .....

3). Print 9 8 7
6 5 4.
3 2 1.

```
int main(){
    int n;
    cin>>n;
    int toPrint=n*n;
    for(int i=1;i<=n;i++){
        for(int j=1;j<=n;j++){
            cout<<toPrint<<" ";
            toPrint--;
        }
        cout<<endl;
    }
    return 0;
}
```

4). Print
*
* *
* * *
* * * *

```
int main(){
    int n;
    cin>>n;
    int row, col;
    for(row=1;row<=n;row++){
        for(col=1;col<=row;col++){
            cout<<"*"<<" ";
        }
        cout<<endl;
    }
    return 0;
}.
```

5). Print 1
2 2
3 3 3
4 4 4 4

```
int main(){
    int n;
    cin>>n;
    int row,col;
    for(row=1;row<=n;row++){
        for(col=1;col<=row;col++){
            cout<<row<<" ";
        }
        cout<<endl;
    }
}.
```

6). Print 1 Floyd's Triangle.
2 3
4 5 6
7 8 9 10.

```
int main(){
    int n;
    cin>>n;
    int row,col;
    int toprint=1;
    for(row=1;row<=n;row++){
        for(col=1;col<=row;col++){
            cout<<toprint<<" ";
            toprint++;
        }cout<<endl;
    }.
}
```

Signature .....

7). Print 1
2 3
3 4 5
4 5 6 7.

```
int main(){
    int n;
    cin>>n;
    int row,col;
    int toprint=1;
    for(row=1;row<=n;row++){
        toprint=row;
        for(col=1;col<=row;col++){
            cout<<toprint<<" ";
            toprint++;
        }
        cout<<endl;
    }
```

8). Print 1
2 1
3 2 1
4 3 2 1.

toprint=row

toprint--;

Logic. column = 1 2 3 4. n=4.
row = 1 1
2 2 1
3 3 2 1
4. 4 3 2 1

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```
int main(){
    int n;
    cin>>n;
    int row, col;
    for (row=1; row<=n; row++){
        for (col=1; col<=row; col++){
            cout<< row-col+1 <<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

9). Print
```
A A A
B B B
C C C.
```

```
int main(){
    int n;
    cin>>n;
    int row, col;
    for(row=1; row<=n; row++){
        for(col=1; col<=n; col++){
            cout<<char(65+row-1)<<" ";
        }
        cout<<endl;
    }
}
```

Signature .....

10). Print A B C
A B C
A B C

```
int main(){
    int n;
    cin>>n;
    int row,col;
    char ch='A';
    for(row=1; row<=n; row++){
        ch='A';
        for(col=1; col<=n; col++){
            cout<<char(ch)<<" ";
            ch++;
        }
        cout<<endl;
    }
    return 0;
}
```

11). Print A B C D
E F G H
I J K L
M N O P.

```
int main(){
    int n;
    cin>>n;
    int row,col;
    char ch='A';
    for(row=1; row<=n; row++){
        for(col=1; col<=n; col++){
            cout<<char(ch)<<" ";
            ch++;
        }
        cout<<endl;
    }
    return 0;
}
```

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12) Print A B C
B C D
C D E

```
int main(){
    int n;
    cin>>n;
    int row,col;
     char ch;
    for(row=1;row<=n;row++){
        { ch='A'+row-1;
          for(col=1;col<=n;col++){
              cout<<char(ch)<<" ";
              ch++;
          }
```

13) Print A
B B
C C C

```
int main(){
    int n;
    cin>>n;
    int row,col;
     char ch;
   for(row=1;row<=n;row++){
        for(col=1;col<=row;col++){
            cout<<char('A'+row-1)<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

Signature .....

14). Print
A
B C
D E F
G H I J

```
int main(){
    int n;
    cin>>n;
    char toPrint='A';
    for(int row=1;row<=n;row++){
        for(int col=1;col<=row;col++){
            cout<<char(toPrint)<<" ";
            toPrint++;
        }
        cout<<endl;
    }
    return 0;
}
```

15). Print
A
B C
C D E.
D E F G.

```
int main(){
    int n;
    cin>>n;
    char toPrint='A';
    for(int row=1;row<=n;row++){
        toPrint='A'+row-1;
        for(int col=1;col<=row;col++){
            cout<<char(toPrint)<<" ";
            toPrint++;
        }
        cout<<endl;
    }
    return 0;
}
```

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16). Print :
D
C D
B C D
A B C D.

```
int main(){
    int n;
    cin>>n;
    char toPrint;
    int row,col;
for (row=1; row<=n; row++){
    toPrint = 'A'+n-row;   or // toPrint = 'D'-row+1;
    for (col=1; col<=row; col++){
            cout<<char(toPrint)<<" ";
            toPrint++;
        }
        cout<<endl;
return 0;
}
```

17). Print

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

Logic: For row 'i', we are first printing n-i spaces and then printing i stars.

```
int main(){
    int n; cin>>n; int i,j;
for (i=1; i<=n; i++){        n, i<=i → check
    for (int space=1; space<=n-i; space++){
            cout<<" ";
        }
    for (j=1; j<=i; j++){
            cout<<"*";
        }
    cout<<endl;
}
return 0;
}
```

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18). Print: * * * *
* * *
* *
*

```
int main(){
    int n; cin>>n; int i,j;
    for(i=1;i<=n;i++){
        for(j=1;j<=n;j++){
            cout<<"*"<<" ";
        }
        cout<<endl;
    }return 0;
```

19). Print: * * * *
* * *
* *
*

Logic: Printing i-1 spaces; and n-i+1 stars for ith row.

```
int main(){
    int n; cin>>n; int i,j;
    for(i=1;i<=n;i++){
        for(int space=1;space<i;space++){
            cout<<" ";
        }
        for(j=1;j<=n-i+1;j++){
            cout<<"*";
        }
        cout<<endl;
    }
return 0;
}
```

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20) Print : 1 1 1 1
2 2 2
3 3
4.

```
int main(){
    int n;
    cin>>n;
    int i,j;
    for(i=1;i<=n;i++){
        for(int space=1;space<i;space++){
            cout<<" ";
        }
        for(j=1;j<=n-i+1;j++){
            cout<<i;
        }
        cout<<endl;
    }
    return 0;
}
```

21) Print : 1
2 2
3 3 3
4 4 4 4

```
int main(){
    int n; cin>>n;int i,j;
    for(i=1;i<=n;i++){
        for(int space=1;space<=n-i;space++){
            cout<<" ";
        }
        for(j=1;j<=i;j++){
            cout<<i;
        }
        cout<<endl;
    }
    return 0;
}
```

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22). Print :
1
2 3
4 5 6.
7 8 9 10..

Logic : print space (n-i) times and print num and then increment num.

```
int main(){
    int n; cin>>n; int i,j,num=1;
    for(i=1; i<=n;i++){
        for(int space=1; space<=n-i; space
            cout<<" ";
        }
    for(j=1;j<=i;j++){
        cout<<num;
        num++;
    }
    cout<<endl;
}}
```

23). Print :

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

Logic : Use 2 while loops for each row i.
One for printing (n-i) "_" [double spaces]
One for printing from 1 to i
other for printing from (i-1) to 1.

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```
int main(){
    int n; cin>>n;
    for(i=1;i<=n;i++){
        for(space=1;space<=n-i;space++){
            cout<<" ";
        }
        for(j=1;j<=i;j++){
            cout<<j<<" ";
        }
        for(j=i-1;j>=1;j--){
            cout<<j<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

24). Print

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

```
for(i=1;i<=n;i++){
    for(j=1;j<=n-i+1;j++){
        cout<<j<<" ";
    }
    for(j=1;j<=(i-1)*2;j++){
        cout<<"* ";
    }
    for(j=n-i+1;j>=1;j--){
        cout<<j<<" ";
    }
    cout<<endl;
}
return 0;
}
```

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25). Print:
```
    *
  * *
* * *
```

```
void main(){
    int n; cin>>n ;int i,j,k,t=0;
for(i=1; i<=n; i++){
        for(k=t; k<n; k++){
            printf(" ");
        }
        for(j=0; j<i; j++){
            printf("*");
            t=t+1;
        }
        printf("\n");
    }
}.
```

:OR:

```
void main(){
    int i, space, rows, k=0;
    int n; cin>>n;
for(i=1; i<=rows; i++, k=0){
        for(space=1; space<=rows-i; space++){
            cout<<" ";
        }
        while(k!=2*i-1){
            cout<<"* ";
            k++;
        }
        cout<<"\n";
    }
return 0;
}
```

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26). Print :

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

```
int main(){
    int i, space, rows, k=0, count=0, count1=0;
    cin >> rows;
    for(i=1; i<=rows; i++){
        for(space=1; space<=rows-i; space++){
            cout << " ";
            count++;
        }
        while(k != 2*i-1){
            if(count <= rows-1){
                cout << i+k;
                count++;
            }else{
                count1++;
                cout << i+k-2*count1;
            }
            k++;
        }
        count1 = count = k = 0;
        cout << "\n";
    }
    return 0;
}
```

27) Print:
```
* * * * *
  * * *
    *
```

```
int main(){
    int rows, i, j, space;
    cin >> rows;
    for (i=rows; i>=1; i--) {
        for (space=0; space<rows-i; space++){
            cout << " ";
        for (j=i; j<=2*i-1; j++)
            cout << " * ";
        for (j=0; j<i-1; j++) {
            cout << " * ";
        cout << "\n";
    }
    return 0;
}.
```

28). Print:
```
      1
    1   1
  1   2   1
1   3   3   1
```
PASCAL TRIANGLE.

```
int main(){
    int rows, coef=1, space, i, j;
    cin >> rows;
    for (i=0; i<rows; i++){
        for (space=1; space<=rows-i; space++)
            cout << " ";
        for (j=0; j<=i; j++) {
            if (j==0 || i==0)
                coef = 1;
            else
                coef = coef*(i-j+1)/j;
            cout << coef;
        }
    cout << "\n";
```

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24) Print: * * * * Hollow rectangle.
* *
* *
* *
* * * *

```
int main(){
    int rows, columns;
    cin >> rows >> columns;
    for (int i=1; i<=rows; i++){
        for (int j=1; j<=columns; j++){
            if (i==1 || i==rows || j==1 || j==columns){
                cout << "*";
            }
            else {
                cout << " ";
            }
        }
        cout << endl;
    }
    return 0;
}
```

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30) Print 0-1 Pattern:

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

```
int main(){
    int i,j,r;
    cin>>r;
    for(i=1;i<=r;i++){
        for(j=1;j<=i;j++){
            if((i+j)%2==0){
                cout<<"1";
            else
                cout<<" 0";
            }
            cout<<endl;
        }
        return 0;
}.
```

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31). Palindromic pattern:

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

```
int main(){
    int i,j,r;
    cin>>r;
    for(i=1;i<=r;i++){
        int k=i;
        for(j=1;j<=(r-i);j++){
            cout<<" ";
        }
        for(;j<=r;j++){
            cout<<k<<" ";
            k--;
        }
        k=1;
        for(;j<(r+i);j++){
            k++;
            cout<<k<<" ";
        }
        for(;j<=(2*r-1);j++){
            cout<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

Signature .....

32). Print Diamond using stars : Given n, print diamond with 2*n rows.

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

```
int main(){
    int n;
    cin>>n;
    int space=(2*n-1)/2;
    for(int i=1; i<=n ;i++){
        for(int j=1;j<=space;j++){
            cout<<" ";
        }
        for(int j=1;j<=2*i-1;j++){
            cout<<"*";
        }
        cout<<endl;
        space--;
    }
    space=0;
    for(int i=n;i>=1;i--){
        for(int j=1;j<=space;j++){
            cout<<" ";
        }
        for(int j=1;j<=2*i-1;j++){
            cout<<"*";
        }
        cout<<endl;
        space++;
    }
    return 0;
}
```

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33). Print Solid Rhombus:

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

```
int main(){
    int n;
    cin>>n;
    for(int i=1;i<=n;i++){
        for(int j=1;j<=n-i;j++){
            cout<<" ";
        }
        for(int j=1;j<=n;j++){
            cout<<"*";
        }
        cout<<"*";
    }
    cout<<"\n";
}
return 0;
}.
```

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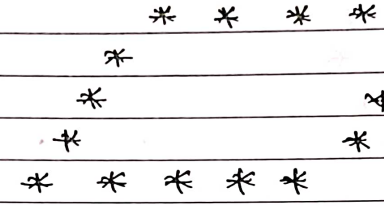
34). Print Hollow Rhombus



```
int main(){
    int n;
    cin>>n;
    for(int i=1;i<=n;i++){
        for(int j=1;j<=n-i;j++){
            cout<<" ";
        }
        for(int j=1;j<=n;j++){
            if(i==1 || i==n){
                cout<<"*";
            }else{
                if(j==1 || j==n){
                    cout<<"*";
                }else{
                    cout<<" ";
                }
            }
        }
        cout<<"\n";
    }
    return 0;
}
```

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35). Print:

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

```
int main(){
    int n;
    cin>>n;
    int space = n-1;
    for(int i=1 ; i<=n ; i++){
        for(int j=1 ; j<=space ; j++){
            cout<<" ";
        }
        space--;
        for(int j=1 ; j<=i ; j++){
            cout<<i<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

Signature .....

36) Print:

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

```
int main(){
    int n;
    cin>>n;
    int space=n-1;
    for(int i=1;i<=n;i++){
        for(int j=1;j<=space;j++){
            cout<<" ";
        }
        space--;
        for(int j=1;j<=i;j++){
            cout<<j<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

37) Zig-zag pattern. 9-i/p.

o/p -

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

```
int main(){
    int i,j,n;
    cin>>n;
    for(i=1;i<=3;i++){
        for(j=1;j<=n;j++){
            if(((i+j)%4==0)||((i==2)&&(j%4==0)))
                cout<<"* ";
            else
                cout<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

38) Print :

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

PASCAL'S TRIANGLE.

```
void main(){
    int n, temp=1, i,j,k;
    cin>>n;
    for(i=0;i<n;i++){
        for(k=1;k<=n-i;k++){
            cout<<" ";
        for(j=0;j<=i;j++){
            if(j==0 || i==0)
                temp=1;
            else
                temp= temp*(i-j+1)/j;
            cout<<" "<<temp<<" ";
        }
        cout<<endl;
    }
}
```

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39). Half Pyramid Pattern:

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

```
void main(){
    int i, j, k, n;
    cout << cin >>n;
    for (i=1 ; i<=n ; i++) {
        for (k=1; k<= i; k++) {
            cout <<" * ";
        }
        cout <<"\n"}
    }
    for (i=n ;i> 1 ; i--){
        for (k = i ; k>1; k--) {
            cout<<"*";
        }
        cout<<"\n";
    }
}
```

40) Left Half Diamond Pyramid:

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

```
Void main(){
    int i,j,k,n;
    cin>>n;
    for(i=0;i<n;i++){
        for(j=0;j<n;j++){
            cout<<" ";
        }
        for(k=0;k<=i;k++){
            cout<<"*";
        }
        cout<<"\n";
    }
    for(i=n-1;i>0;i--){
        for(j=n;j>=i;j--){
            cout<<" ";
        for(k=i;k>0;k--){
            cout<<"*";
        }
        cout<<"\n";
    }
}
```

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41) Left inclined solid Rhombus:

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

```
void main(){
    int i,j,n,k;
    cin>>n;
    for(i=n; i>=1 ;i--){
        for(j=1; j<=n-i ;j++){
            cout<<" ";
        }
        for(k=1; k<=n;k++){
            cout<<"*";
        }
        cout<<"\n";
    }
}
```

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42). Solid Rectangle:

```
* * * *
* * * *
* * * *.
```

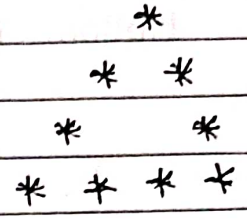
```
void main(){
    int i,j,row,columns;
    cin>>row>>columns;
    for(i=1;i<=row;i++){
        for(j=1;j<=columns;j++){
            cout<<"*"<<" ";
        }
        cout<<endl;
    }
}.
```

43). Hollow square:

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

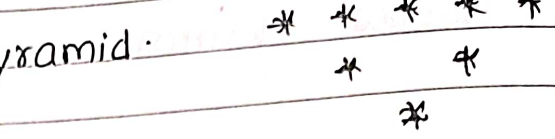
```
int main(){
    int i,j,d;
    cin>>d;
    for(i=0;i<d;i++){
        for(j=0;j<d;j++){
            if(i==0||i==d-1||j==0||j==d-1
                cout<<"* ";
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }
}
```

44). Print Hollow Pyramid star pattern.



```
int main(){
    int i,j,k,r;
    cin>>r;
    for(i=0; i<r ;i++){
        for(k=r; k>i+1 ;k--){
            cout<<" ";
        }
        for(j=0; j<=i*2 ;j++){
            if(i==r-1){
                cout<<"*";
            }
            else{
                if(j==0||j>=i*2){
                    cout<<"*";
                }
                else{
                    cout<<" ";
                }
            }
        }
        cout<<endl;
    }
```

45). Hollow inverted Pyramid:



n=3

```
int main(){
    int i,j,k,r;
    cin>>r;
    for(i=r; i>0; i--){
        for(k=r; k>i; k--){
            cout<<" ";
        }
        for(j=0; j<i*2-1; j++){
            if(i==r){
                cout<<"*";
            }
            else{
                if(j==0 || j==i*2-2)
                    cout<<"*";
                }
                else{
                    cout<<" ";
                }
            }
        }
        cout<<endl;
    }
}
```