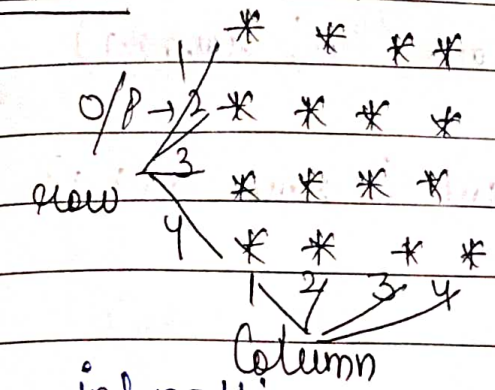
Pattern :- I/P n=4

(1) 

for each row we are printing a column and a new line after each row.

```
int n=4;
for (int row = 1, row <=n; row++)
  {                          // for row
for (int col = 1; col <=n; col++)   // for column
    cout << "* ";
  }
  cout <<endl;
}
```

* * * * 1st R → print * (for col – 1 to 4th)
* * * * 2nd R → " " " " " "
* * * * 3rd R → " " " " " "
* * * * 4th R → " " " " " "

(2) I/P → n=5
O/P →

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

```
for(
row → 1 → n)
  {
//for each row
  * count = row no
for (col 1 → row no)
    { }
  }
```

```
int n=5;
for(int row=1; row<=n; row++)
 {
for ( int col = 1; col <= row; col++)
  {
   cout << " * ";
  }
  // after every row
   cout << endl;
  }
}
```

1C 2C 3C 4C

(3) 1R * * * *
2R * * *
3R * *
4R *

$n=4$

$(n-row)+1$

$4-1+1 \rightarrow 4$

$4-2+1 \rightarrow 3$

$4-3+1 \rightarrow 2$

$4-4+1 \rightarrow 1$

```
for (row 1 to n)
 {
  for (col 1 → n-row+1)
   {
     cout(*)
   }
   cout << endl;
  }
```

Code →

```
for (int row = 1; row <= n; row++)
{
for (int col = 1; col <= n - row + 1; col++)
{
  cout << "* ";
}
cout << endl;
}
```

(4)

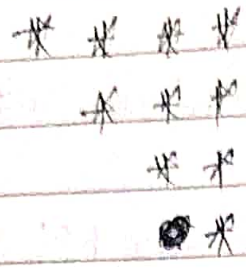
I — — — *
II — — * *
III — * * *
IV * * * *

n - row = space
4 - 1 = (3)

Space → n - row
stars → row.

```
int n = 5;
for (int row = 1; row <= n; row++)
{
 for (int col = 1; col <= n - row; col++)
 {
    cout << " ";        //spaces
 }
for (int col = 1; col <= row; col++) //stars
 {
  cout << "* ";
 }
 cout << endl;
}
```

(5)



Row	space
1	0
2	1
3	2
4	3

Space → row − 1

Row	star
1	4
2	3
3	2
4	1

star → n − row + 1

```
int n=4;
for(int row=1; row<=n; row++)
  {
    //spaces
   for(int col=1; col<=row-1; col++)
     {
       cout<<" ";
     }
   //stars
   for(int col=1; col<=n-row+1; col++)
     {
       cout<<"*";
     }
   cout<<endl;
  }
```

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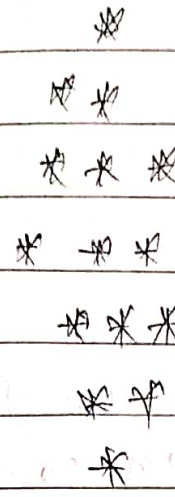
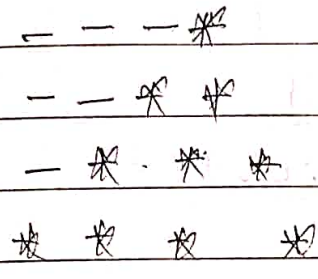
4/10.



Solid diamond heart pattern.

(6)



Row	Space	star
1	3	1
2	2	2
3	1	3
4	0	4
	n-row	row

```
for (int row = 1; row <= n; row++)
  {
  //spaces
  for (int col = 1; col <= n-row; col++)
    {
    cout << " ";
    }
                    //stars
  for (int col = 1; col <= row; col++)
    {
    cout << "_*";  }
```

Date:

```
cout <<endl;
}
```

⑦ # Solid Diamond

```
* * * *      space → row - 1
- * * *      star → n - row + 1
- - * *
- - - *
```

row = 1

n = 4

star → n - row + 1

```
for(int row = 1; row <= n; row++)
{
for(int col = 1; col <= row - 1; col++)
    {
    cout << " - ";
    }
for(int col = 1; col <= n - row + 1; col++)
    {
    cout << " * ";
    }
cout <<endl;
```

(8) Hollow Inverted Half Pyramid -

```
* * * * * *   n=6
*  - - - *
*  - - *
*  - *
*  *
*
```

```
for(row → 1 to n)
{
   if(row==1 || row==n)
   {
   }
   else
   {
      cout << *
      // space
      cout << *
   }
```

because there is no space in last row.

space → n - row - 1

```
for(int row=1; row<=n; row++)
  {
    if(row==1 || row==n)
    {
      for(int col=1; col<=n-row+1; col++)
      {
        cout<<"*";
      }
    }else
      {
        cout<<"*";
      for(int col=1; col<=n-row-1; col++)
        {
          cout<<" ";
        }
        cout<<"*";
      }
    cout<<endl; }.
```