```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nc;c++)
{
if(r%2==0)printf("%2c",96+c);else printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows and columns 10 26
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 a b c d e f g h i j k l m n o p q r s t u v w x y z
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 a b c d e f g h i j k l m n o p q r s t u v w x y z
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 a b c d e f g h i j k l m n o p q r s t u v w x y z
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 a b c d e f g h i j k l m n o p q r s t u v w x y z
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 a b c d e f g h i j k l m n o p q r s t u v w x y z
```

```c
for( r=1; r<=4; r++ )
{
for( c=1; c<=4; c++)
{
if(r%2==0) p(96+c);
else  p(64+c);
}
printf("\n");
}
```
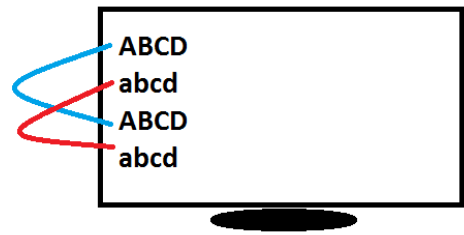
ABCD
abcd
ABCD
abcd

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nc;c++)
{
if(c%2==0)printf("%2c",96+c);else printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows and columns 10 26
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
 A b C d E f G h I j K l M n O p Q r S t U v W x Y z
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nc;c++)
{
if(r%2==0)printf("%2c",96+r);else printf("%2c",64+r);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows and columns 10 20
 A A A A A A A A A A A A A A A A A A A A
 b b b b b b b b b b b b b b b b b b b b
 C C C C C C C C C C C C C C C C C C C C
 d d d d d d d d d d d d d d d d d d d d
 E E E E E E E E E E E E E E E E E E E E
 f f f f f f f f f f f f f f f f f f f f
 G G G G G G G G G G G G G G G G G G G G
 h h h h h h h h h h h h h h h h h h h h
 I I I I I I I I I I I I I I I I I I I I
 j j j j j j j j j j j j j j j j j j j j
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c; char U='A', L='a';
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nc;c++)
{
if(r%2==0)printf("%2c",L);else printf("%2c",U);
}
printf("\n"); if(r%2==0)L++;else U++;
}
getch();
}
```

```
Enter how many rows and columns 10 26
 A A A A A A A A A A A A A A A A A A A A A A A A A A
 a a a a a a a a a a a a a a a a a a a a a a a a a a
 B B B B B B B B B B B B B B B B B B B B B B B B B B
 b b b b b b b b b b b b b b b b b b b b b b b b b b
 C C C C C C C C C C C C C C C C C C C C C C C C C C
 c c c c c c c c c c c c c c c c c c c c c c c c c c
 D D D D D D D D D D D D D D D D D D D D D D D D D D
 d d d d d d d d d d d d d d d d d d d d d d d d d d
 E E E E E E E E E E E E E E E E E E E E E E E E E E
 e e e e e e e e e e e e e e e e e e e e e e e e e e
```

```
char U='A', L='a';
for( r=1; r<=4; r++ )
{
for( c=1; c<=4; c++)
{
if(r%2==0) p( L );
else  p( U );
}
printf("\n");    if(r%2==0)L++;else U++;
}
```

6
1
2 ✓
3
4

E

AAAA
aaaa
BBBB
bbbb

L

2 a aaa
4 b bbb
6 c ccc

U

1 A A A A
3 B B B B
5 C C C C

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{char U='A', L='a';
for(c=1;c<=nc;c++)
{
if(c%2==0)printf("%c",L++);else printf("%c",U++);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows and columns 10 52
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c; char ch='A';
clrscr();
printf("Enter how many rows and columns "); scanf("%d%d",&nr,&nc);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nc;c++)
{
if(r==1||c==1||r==nr||c==nc)printf("* ");else printf("%c ",ch++);
if(ch>'Z')ch='A';
}
printf("\n");
}
getch();
}
```

```
Enter how many rows and columns 10 20
* * * * * * * * * * * * * * * * * * * *
* A B C D E F G H I J K L M N O P Q R *
* S T U V W X Y Z A B C D E F G H I J *
* K L M N O P Q R S T U V W X Y Z A B *
* C D E F G H I J K L M N O P Q R S T *
* U V W X Y Z A B C D E F G H I J K L *
* M N O P Q R S T U V W X Y Z A B C D *
* E F G H I J K L M N O P Q R S T U V *
* W X Y Z A B C D E F G H I J K L M N *
* * * * * * * * * * * * * * * * * * * *
```
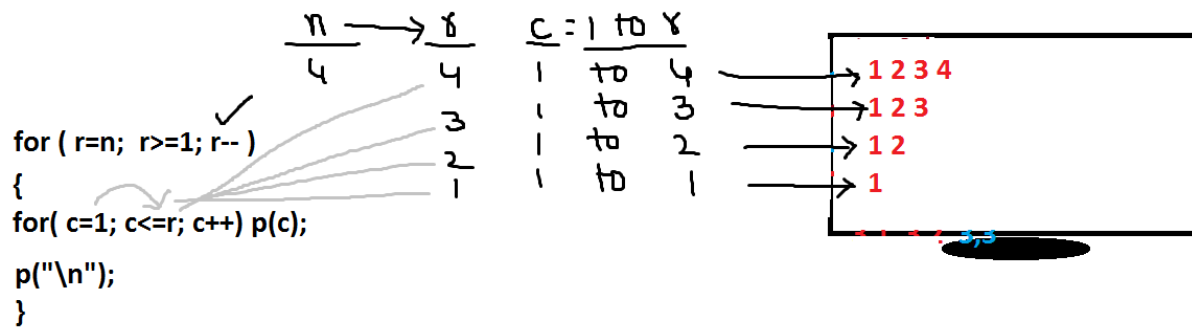
```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,r,c;
clrscr();
printf("Enter how many rows  "); scanf("%d",&nr);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nr;c++)
{
if(c<=nr-r)printf("1 ");else printf("%d ",r);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  4
1 1 1 1
1 1 2 2
1 3 3 3
4 4 4 4
```

```
Enter how many rows   9
1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 2 2
1 1 1 1 1 1 3 3 3
1 1 1 1 1 4 4 4 4
1 1 1 1 5 5 5 5 5
1 1 1 6 6 6 6 6 6
1 1 7 7 7 7 7 7 7
1 8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9 9
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,r,c;
clrscr();
printf("Enter how many rows  "); scanf("%d",&nr);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nr;c++)
{
if(c<=nr-r)printf("%3d",1);else printf("%3d",r);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  15
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1  1  1  1  1  1  1  1  1  1  2  2
  1  1  1  1  1  1  1  1  1  1  1  1  3  3  3
  1  1  1  1  1  1  1  1  1  1  1  4  4  4  4
  1  1  1  1  1  1  1  1  1  1  5  5  5  5  5
  1  1  1  1  1  1  1  1  1  6  6  6  6  6  6
  1  1  1  1  1  1  1  1  7  7  7  7  7  7  7
  1  1  1  1  1  1  1  8  8  8  8  8  8  8  8
  1  1  1  1  1  1  9  9  9  9  9  9  9  9  9
  1  1  1  1  1 10 10 10 10 10 10 10 10 10 10
  1  1  1  1 11 11 11 11 11 11 11 11 11 11 11
  1  1  1 12 12 12 12 12 12 12 12 12 12 12 12
  1  1 13 13 13 13 13 13 13 13 13 13 13 13 13
  1 14 14 14 14 14 14 14 14 14 14 14 14 14 14
 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15
```

```
                    ✓        ch='A';
         for( r=1; r<=4; r++ )
         {
         for( c=1; c<=4; c++)
         {      4-3=1          3
                4-2=2          2
                4-1=3          1
         if(c<=n-r)p(1);else p(r);

         }
         printf("\n"); ✓
         }
```

$$\frac{r}{4} - \frac{c}{1} = \frac{1}{3} \qquad \frac{r}{1}$$

$$4 - 2 = ② \qquad 2$$

$$4 - 3 = ① \qquad 3$$

$$4 - 4 = ⓪ \qquad 4$$

$$\frac{L}{a}$$

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

$$\frac{U}{A\ A\ A\ A}$$

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,r,c;
clrscr();
printf("Enter how many rows  "); scanf("%d",&nr);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nr;c++)
{
if(r==c)printf("1 ");else if(r>c)printf("2 ");else printf("0 ");
}
printf("\n");
}
getch();
}
```

```
Enter how many rows   9
1 0 0 0 0 0 0 0 0
2 1 0 0 0 0 0 0 0
2 2 1 0 0 0 0 0 0
2 2 2 1 0 0 0 0 0
2 2 2 2 1 0 0 0 0
2 2 2 2 2 1 0 0 0
2 2 2 2 2 2 1 0 0
2 2 2 2 2 2 2 1 0
2 2 2 2 2 2 2 2 1
```

```c
                ch='A';
for( r=1; r<=4; r++ )
{
for( c=1; c<=4; c++)

if(r==c)p(1);else if(r>c)p(2);
else p(0);
}
printf("\n");
}
```

$\dfrac{nr}{4} - \dfrac{c}{1} = \dfrac{1}{3}$ $\dfrac{r}{1}$

$4 - 2 = ②$ 2

$4 - 3 = ①$ 3

$4 - 4 = ⓪$ 4

$\dfrac{L}{q}$ $\dfrac{c}{\text{A A A A}}$

```
1    0    0
1,1  1,2  1,3

2    1    0
2,1  2,2  2,3

2    2    1
3,1  3,2  3,3
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&nr);
for(r=1;r<=nr;r++)
{
for(c=1;c<=nr;c++)
{
if(r==c){textcolor(LIGHTRED);cprintf("1 ");}
else if(r>c){textcolor(LIGHTGREEN);cprintf("2 ");}
else {textcolor(YELLOW);cprintf("0 ");}
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  9
1 0 0 0 0 0 0 0 0
2 1 0 0 0 0 0 0 0
2 2 1 0 0 0 0 0 0
2 2 2 1 0 0 0 0 0
2 2 2 2 1 0 0 0 0
2 2 2 2 2 1 0 0 0
2 2 2 2 2 2 1 0 0
2 2 2 2 2 2 2 1 0
2 2 2 2 2 2 2 2 1
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=n;r>=1;r--)
{
for(c=1;c<=r;c++)
{
printf("%3d",c);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  10
  1  2  3  4  5  6  7  8  9 10
  1  2  3  4  5  6  7  8  9
  1  2  3  4  5  6  7  8
  1  2  3  4  5  6  7
  1  2  3  4  5  6
  1  2  3  4  5
  1  2  3  4
  1  2  3
  1  2
  1
```

$$\frac{n \longrightarrow 8}{4}$$

$c : 1 \ to \ 8$

4	1 to	4
3	1 to	3
2	1 to	2
1	1 to	1

```
for ( r=n;  r>=1; r-- )
{
for( c=1; c<=r; c++) p(c);

p("\n");
}
```

→ 1 2 3 4
→ 1 2 3
→ 1 2
→ 1

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
printf("%3d",c);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  10
  1
  1  2
  1  2  3
  1  2  3  4
  1  2  3  4  5
  1  2  3  4  5  6
  1  2  3  4  5  6  7
  1  2  3  4  5  6  7  8
  1  2  3  4  5  6  7  8  9
  1  2  3  4  5  6  7  8  9 10
```
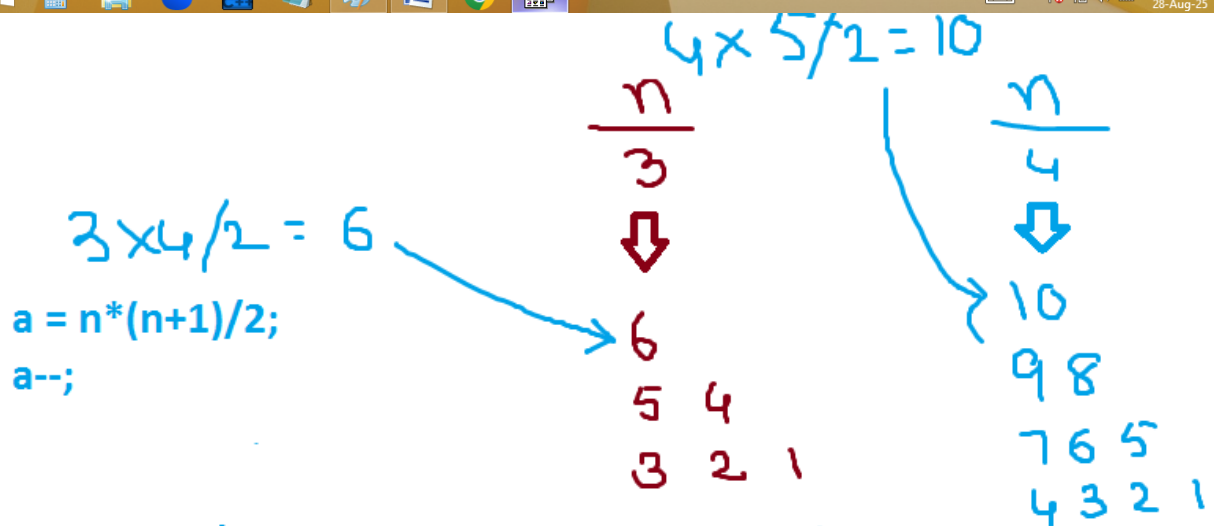
```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
printf("* ");
}
printf("\n");
}
getch();  _
}
```

```
Enter how many rows   10
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * * * *
* * * * * * * *
* * * * * * * * *
* * * * * * * * * *
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
if((r+c)%2==0)printf("$ ");else printf("* ");
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  10
$
* $
$ * $
* $ * $
$ * $ * $
* $ * $ * $
$ * $ * $ * $
* $ * $ * $ * $
$ * $ * $ * $ * $
* $ * $ * $ * $ * $
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,a=1; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
printf("%3d",a++);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows   5
  1
  2   3
  4   5   6
  7   8   9  10
 11  12  13  14  15
```

```
Enter how many rows    10
  1
  2   3
  4   5   6
  7   8   9  10
 11  12  13  14  15
 16  17  18  19  20  21
 22  23  24  25  26  27  28
 29  30  31  32  33  34  35  36
 37  38  39  40  41  42  43  44  45
 46  47  48  49  50  51  52  53  54  55
```

```
Enter how many rows    3
  1
  2   3
  4   5   6
```

FLOYD'S TRIANGLE

```
1
2 3
4 5 6
7 8 9 10
```
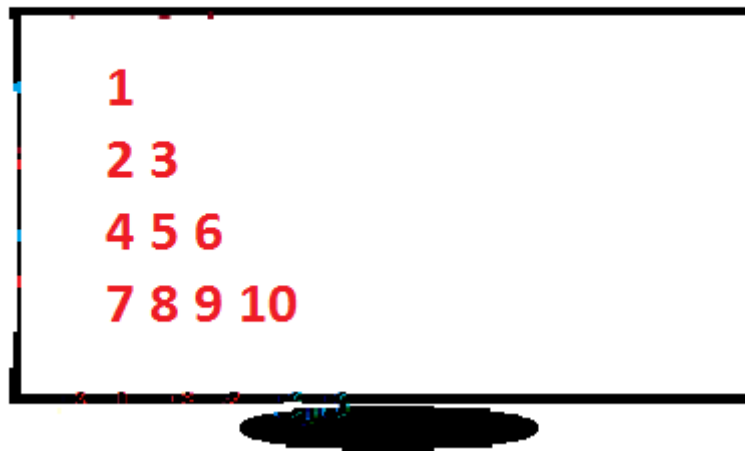
```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,a; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
a=n*(n+1)/2;
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
printf("%3d",a--);
}
printf("\n");
}
getch();
}
```

```
Enter how many rows   10
 55
 54 53
 52 51 50
 49 48 47 46
 45 44 43 42 41
 40 39 38 37 36 35
 34 33 32 31 30 29 28
 27 26 25 24 23 22 21 20
 19 18 17 16 15 14 13 12 11
 10  9  8  7  6  5  4  3  2  1
```

```
TC                                                    –  □  ×
Enter how many rows   3
  6
  5   4
  3   2   1
```

$4 \times 5 / 2 = 10$

$\dfrac{n}{3}$

$3 \times 4 / 2 = 6$

$\dfrac{n}{4}$

a = n*(n+1)/2;

a--;

6
5   4
3   2   1

10
9 8
7 6 5
4 3 2 1

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=n;c++)
{
if(c<=n-r)printf(" "); else printf("*");
}
printf("\n");
}
getch();
}
```

```
Enter how many rows  10
         *
        **
       ***
      ****
     *****
    ******
   *******
  ********
 *********
**********

```

```
for( r=1; r<=4; r++ )
{
for( c=1; c<=4; c++ )
{
if(c<=n-r)p(" ");else p(*);
}
p("\n");
}
```

$$\frac{n}{4} \quad \frac{r}{1} \quad = \quad \frac{"\ "}{3} \quad \frac{c=1\ to\ Y}{1-1}$$

$$4 - 2 = 2 \quad 1-2$$

$$4 - 3 = 1 \quad 1-3$$

$$4 - 4 = 0 \quad 1-4$$

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,s; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(s=1;s<=n-r;s++)printf(" ");
for(c=1;c<=r;c++) printf("*");
printf("\n");
}
getch();
}
```

```
Enter how many rows  5
    *
   **
  ***
 ****
*****
```

```
for( r=1; r<=4; r++ )
{
for(s=1;s<=n-r;s++)p(" ");

for( c=1; c<=r; c++ )
{
 p(*);
}
p("\n");
}
```

$$n \quad r \quad " \, " \quad c=1 \text{ to } r$$

n		r		" "	c=1 to r
4	−	1	=	3	1-1
4	−	2	=	2	1-2
4	−	3	=	1	1-3
4	−	4	=	0	1-4

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,s; clrscr();
printf("Enter how many rows  "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(s=1;s<=n-r;s++)printf(" ");
for(c=1;c<=r;c++) printf("* ");
printf("\n");
}
getch();
}
```

```
Enter how many rows  10
         *
        * *
       * * *
      * * * *
     * * * * *
    * * * * * *
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