```c
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c,a=1;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
printf("%3d",a++);
}
printf("\n");
}
getch();
}
```

```
Enter no of rows 3
  1
  2   3
  4   5   6
```

```
TC                                                    -  □  ×
Enter no of 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
```

$$\frac{n}{3}$$

r<=n	c<=r	a++
1	1 to 1	1
2	1 to 2	2 3
3	1 to 3	4 5 6

Floyd's triangle

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

```
for(r=1;r<=3;r++)
{
for(c=1;c<=r;c++)p(a++);

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

```
  File    Edit    Run    Compile    Project    Options    Debug    Break/watch
       Line 12      Col 17   Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c,a;
clrscr();
printf("Enter no of 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 no of rows 3
  6
  5  4
  3  2  1
```

```
Enter no of rows 4
 10
  9  8
  7  6  5
  4  3  2  1
_
```

```
Enter no of 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
_
```

a=4*5/2=10

a=3*4/2=6

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

for(r=1;r<=3;r++)

{

for(c=1;c<=r;c++)p(a--);

p("\n");

}

$\dfrac{n}{3}$

r<=n	c<=r	a++
1	1 to 1	1
2	1 to 2	2 3
3	1 to 3	4 5 6

```
6
5 4
3 2 1
```
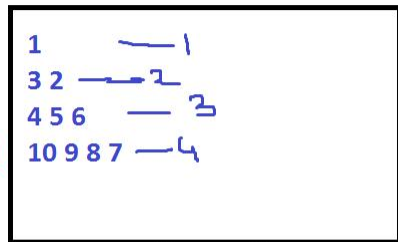
$\dfrac{n}{4}$

```
10
9 8
7 6 5
4 3 2 1
```
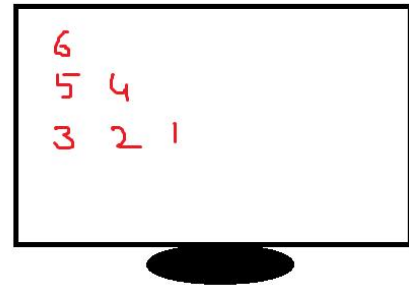
File   Edit   Run   Compile   Project   Options   Debug   Break/watch

Line 5   Col 16   Insert Indent Tab Fill Unindent * E:9AM.C

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c,a=1,b;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{ b=a+r-1;
for(c=1;c<=r;c++,a++)
{
if(r%2==0)printf("%3d",b--); else printf("%3d",a);
}
printf("\n");
}
getch();
}
```

```
                              TC                                    _ □ ×
Enter no of rows 10
  1
  3   2
  4   5   6
 10   9   8   7
 11 12 13 14 15
 21 20 19 18 17 16
 22 23 24 25 26 27 28
 36 35 34 33 32 31 30 29
 37 38 39 40 41 42 43 44 45
 55 54 53 52 51 50 49 48 47 46
```

a=1;
for(r=1; r<=4;r++)
{
b=a+r-1;

for(c=1;c<=r;c++,a++)
{
if(r%2==0) p(b--);

else p(a);
}
p("\n");
}

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=n;r>=1;r--)
{
for(c=1;c<=r;c++)
{
printf("%3d",c);
}
printf("\n");
}
getch();
}
```

```
Enter no of 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
```
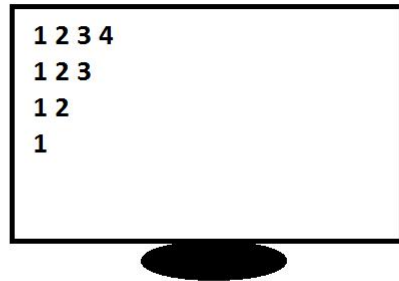
```
for(r=n;r>=1;r--)
{
for(c=1;c<=r;c++ )
{
 p(c);

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

$$\frac{n}{4} \rightarrow \frac{r--}{4}$$

3
2
1

c = 1 to r

1 2 3 4
1 2 3
1 2
1

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

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=n;r>=1;r--)
{
for(c=1;c<=r;c++) printf("%3d",c);
printf("\n");
}
getch();
}
```

```
Enter no of rows 5
  1  2  3  4  5
  1  2  3  4
  1  2  3
  1  2
  1
```

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=r;c<=n;c++) printf("%3d",c);
printf("\n");
}
getch();
}
```

```
Enter no of rows 10
  1  2  3  4  5  6  7  8  9 10
  2  3  4  5  6  7  8  9 10
  3  4  5  6  7  8  9 10
  4  5  6  7  8  9 10
  5  6  7  8  9 10
  6  7  8  9 10
  7  8  9 10
  8  9 10
  9 10
 10
```

```
   File    Edit    Run    Compile    Project    Options    Debug    Break/watch
        Line 10    Col 13   Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c; char ch='A';
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
if(c==1||c==r||r==n)printf("%3c",'*');else printf("%3c",ch++);
}
printf("\n");
}
getch();
}
```

```
Enter no of rows 5
  *
  *   *
  *   A   *
  *   B   C   *
  *   *   *   *   *
```

```c
        Line 18    Col 18   Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c; char ch='A';
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
if(c==1||c==r||r==n)printf("%3c",'*');else printf("%3c",ch++);
if(ch>'Z')ch='A';
}
printf("\n");
}
getch();
}
```

```
Enter no of rows 15
  *
  *   *
  *   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   *
  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *
```
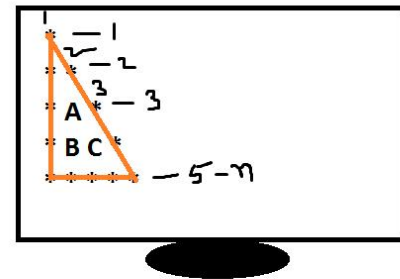
Page: 12 of 12   Words: 0   120%

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

$\dfrac{n}{5}$

r	$c=1$ to r	$\dfrac{ch}{A}$
1	1 to 1	
2	1 to 2	
3	— 3	
4	— 4	
5	— 5	

```
TC                                                                    – ☐ ×
   File    Edit    Run    Compile    Project    Options    Debug    Break/watch
      Line 5      Col 14   Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c; _
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=r;c++)
{
if((r+c)%2==0)printf("%3c",'$');else printf("%3c",'*');
}
printf("\n");
}
getch();
}
```

```
TC
Enter no of rows 10
  $
  *   $
  $   *   $
  *   $   *   $
  $   *   $   *   $
  *   $   *   $   *   $
  $   *   $   *   $   *   $
  *   $   *   $   *   $   *   $
  $   *   $   *   $   *   $   *   $
  *   $   *   $   *   $   *   $   *   $
```
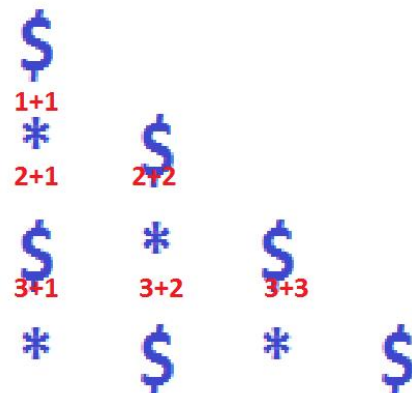
for(r=1;r<=n;r++)
{
for(c=r;c<=r;c++)
{

if(r+c%2==0)p($);else p(*);
}
p("\n");
}

$\frac{n}{5}$	r	c=1 to r
	1	1 to 1
	2	1 to 2
	3	— 3
	4	— 4
	5	— 5

$
1+1

* $
2+1   2+2

$ * $
3+1   3+2   3+3

* $ * $

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=n;c++)
{
if(r==1||r==n||r+c-1==n)printf("Z");else printf(" ");
}
printf("\n");
}
getch();
}
```

TC

```
Enter no of rows 10
ZZZZZZZZZZ
         Z
        Z
       Z
      Z
     Z
    Z
   Z
  Z
 Z
ZZZZZZZZZZ
```

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


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

$$\frac{n}{5}$$

r	c=1 to r
1	1 to 1
2	1 to 2
3	— 3
4	— 4
5	— 5

①   * * * * *

2   21   22   23   24 -1=5
  *

3   31   32   33 *

4   41   42 *

⑤   * * * * *

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(c=1;c<=n;c++)
{
if(c<=n-r)printf(" ");else printf("%d",c);
}
printf("\n");
}
getch();
}
```

```
Enter no of rows 5
    5
   45
  345
 2345
12345
```

```
for(r=1;r<=n;r++)
{

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

n   r   c   c<=n-r   else

5 − 1 = 4   Space   c

5 − 2 = 3

5 − 3 = 2

5 − 4 = 1

5 − 5 = 0

```
+  2  3  4  5
+  +  3  45
+  +  345
-  2345
12345
```



```
                              TC                            - ⟶ ×
  File    Edit    Run    Compile    Project    Options    Debug    Break/watch
     Line 12     Col 38   Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  n, r,c;
clrscr();
printf("Enter no of 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();
}
```
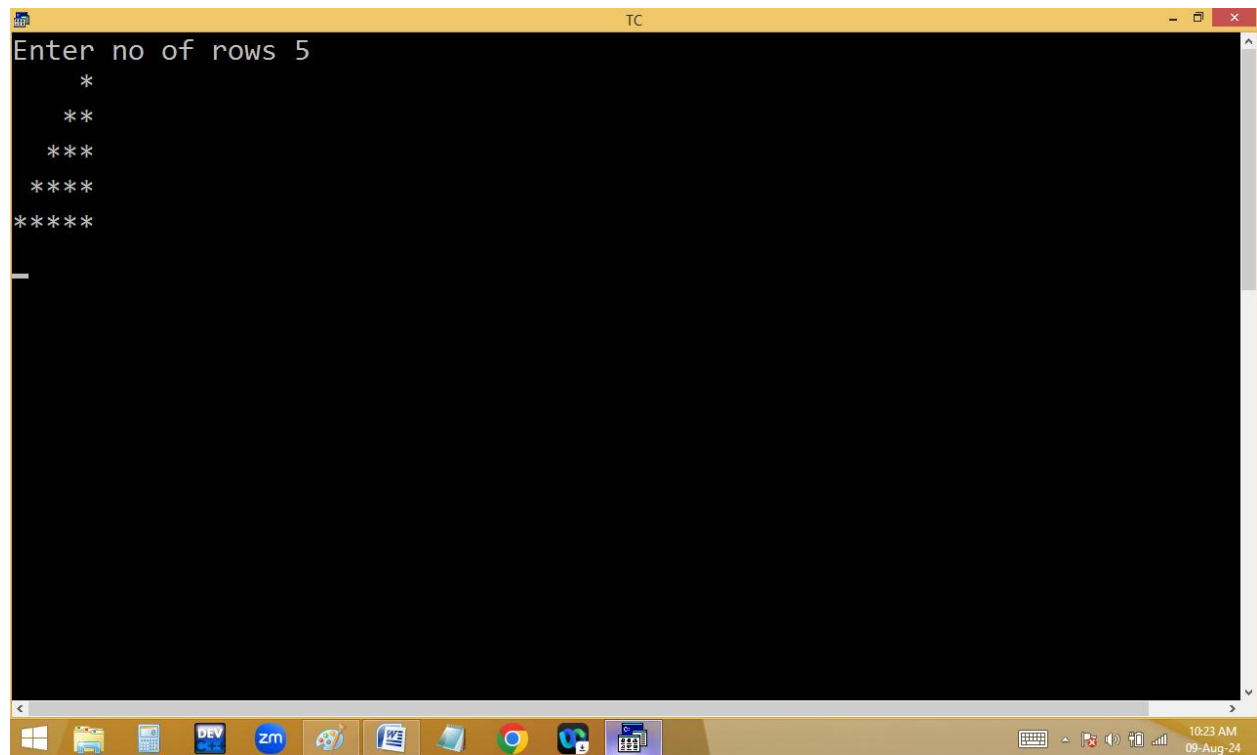
10:23 AM
09-Aug-24

```
Enter no of rows 5
        *
       **
      ***
     ****
    *****
```

File   Edit   Run   Compile   Project   Options   Debug   Break/watch

      Line 12   Col 38   Insert Indent Tab Fill Unindent * E:9AM.C

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c;
clrscr();
printf("Enter no of 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 no of rows 10
         *
        * *
       * * *
      * * * *
     * * * * *
    * * * * * *
   * * * * * * *
  * * * * * * * *
 * * * * * * * * *
* * * * * * * * * *
```

```
for(r=1;r<=n;r++)
{

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

$$\frac{n}{5} \quad \frac{r}{1} = \frac{s}{4}$$

$$5 - 1 = 4$$
$$5 - 2 = 3$$
$$5 - 3 = 2$$
$$5 - 4 = 1$$
$$5 - 5 = 0$$

```
- - - - - * -
- - - - * - * -
- - * - * - * -
- * - * - * - * -
* - * - * - * - * -
```

With 3 loops:

```
File    Edit    Run    Compile    Project    Options    Debug    Break/watch
      Line 12     Col 1     Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c,s;
clrscr();
printf("Enter no of 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 no of rows 10
         *
        * *
       * * *
      * * * *
     * * * * *
    * * * * * *
   * * * * * * *
  * * * * * * * *
 * * * * * * * * *
* * * * * * * * * *
```

```
for(r=1;r<=n;r++)
{

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

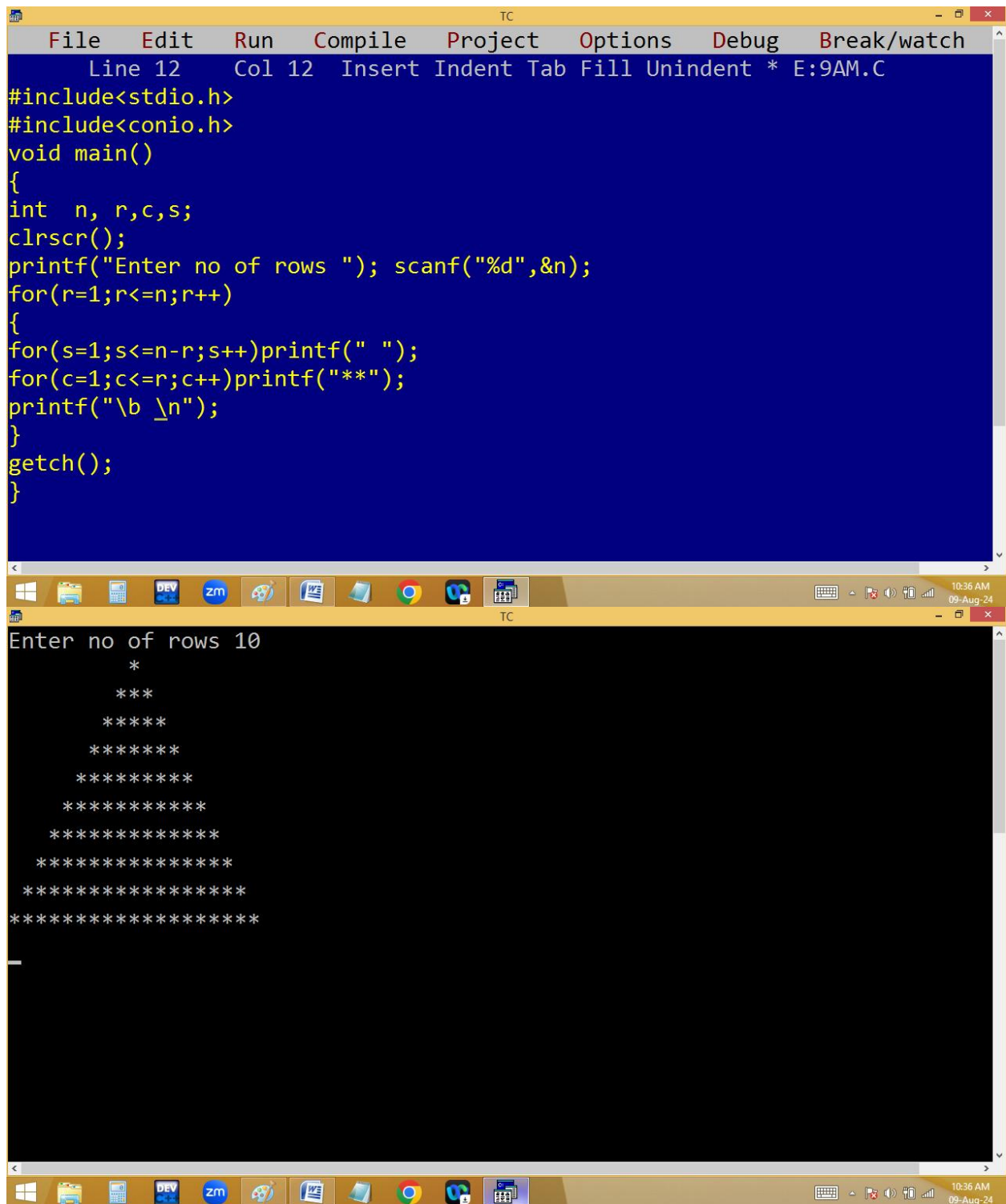| n	r	s	c=1 to r	
5	− 1	= 4	1 to 1	*
5	− 2	= 3	1 to 2	✓
5	− 3	= 2	1 to 3	✓
5	− 4	= 1	1 to 4	
5	− 5	= 0	1 to 5	

```
- - - - - * -
- - - * - * -
- - * - * - * -
- * - * - * - * -
* - * - * - * - * -
```

File   Edit   Run   Compile   Project   Options   Debug   Break/watch
Line 12   Col 12   Insert Indent Tab Fill Unindent * E:9AM.C

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c,s;
clrscr();
printf("Enter no of 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("\b \n");
}
getch();
}
```

10:36 AM
09-Aug-24

```
Enter no of rows 10
         *
        ***
       *****
      *******
     *********
    ***********
   *************
  ***************
 *****************
*******************
```

10:36 AM
09-Aug-24

Without using \b:

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int   n, r,c,s;
clrscr();
printf("Enter no of rows "); scanf("%d",&n);
for(r=1;r<=n;r++)
{
for(s=1;s<=n-r;s++)printf(" ");
for(c=1;c<=2*r-1;c++)printf("*");
printf("\n");
}
getch();
}
```

```
Enter no of rows 10
         *
        ***
       *****
      *******
     *********
    ***********
   *************
  ***************
 *****************
*******************
```

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

for(c=1;c<=r;c++)p(* * );

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

2*r-1
2*1-1=1 star
2*2-1=3 star
2*3-1=5 star
2*4-1=7 star

n	r	s	c=1 to r
5 − 1 = 4			1 to 1 ✶
5 − 2 = 3			1 to 2 ✓
5 − 3 = 2			1 to 3 ✓
5 − 4 = 1			1 to 4
5 − 5 = 0			1 to 5

```
----- *
--- * * *
-- * * * * *
- * * * * * * *
* * * * * * * * *
```