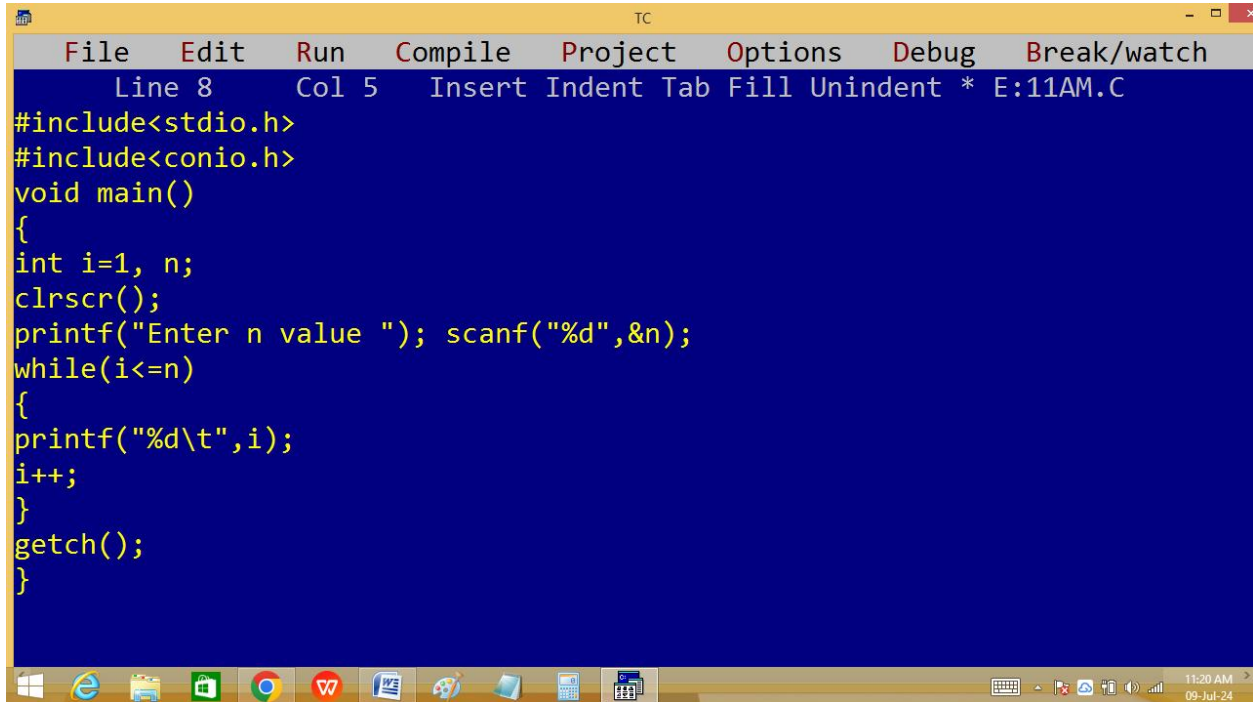


Printing 1..n no's:

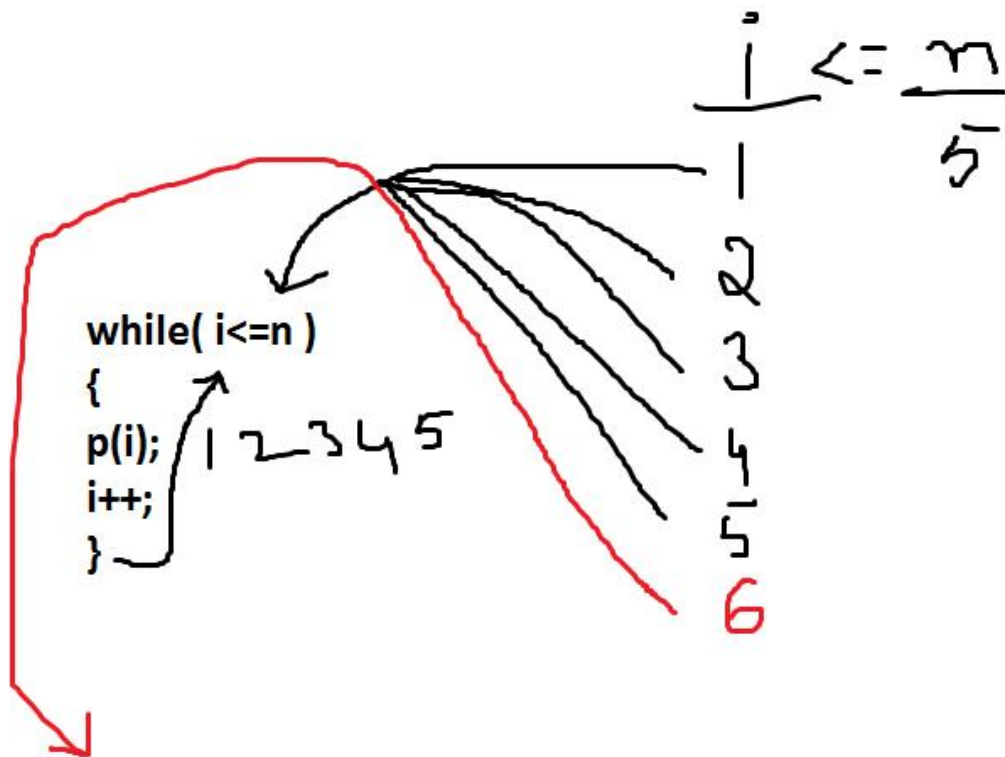
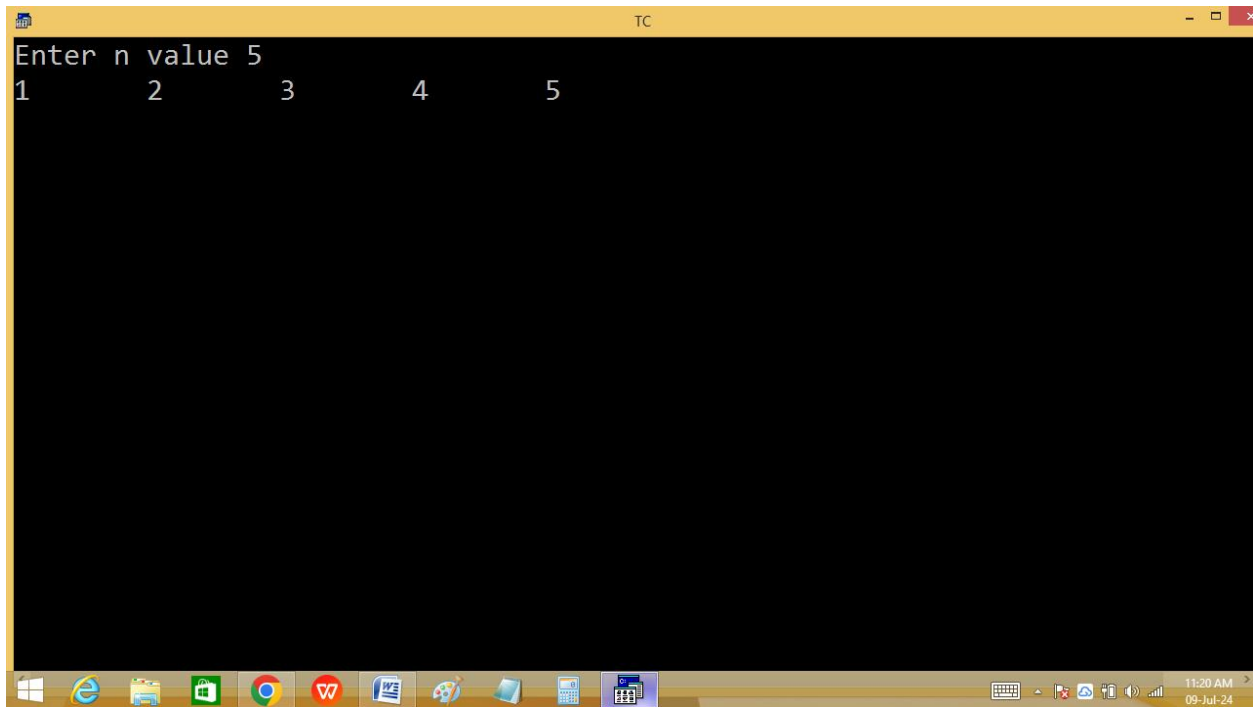
n=5 → 1 2 3 4 5

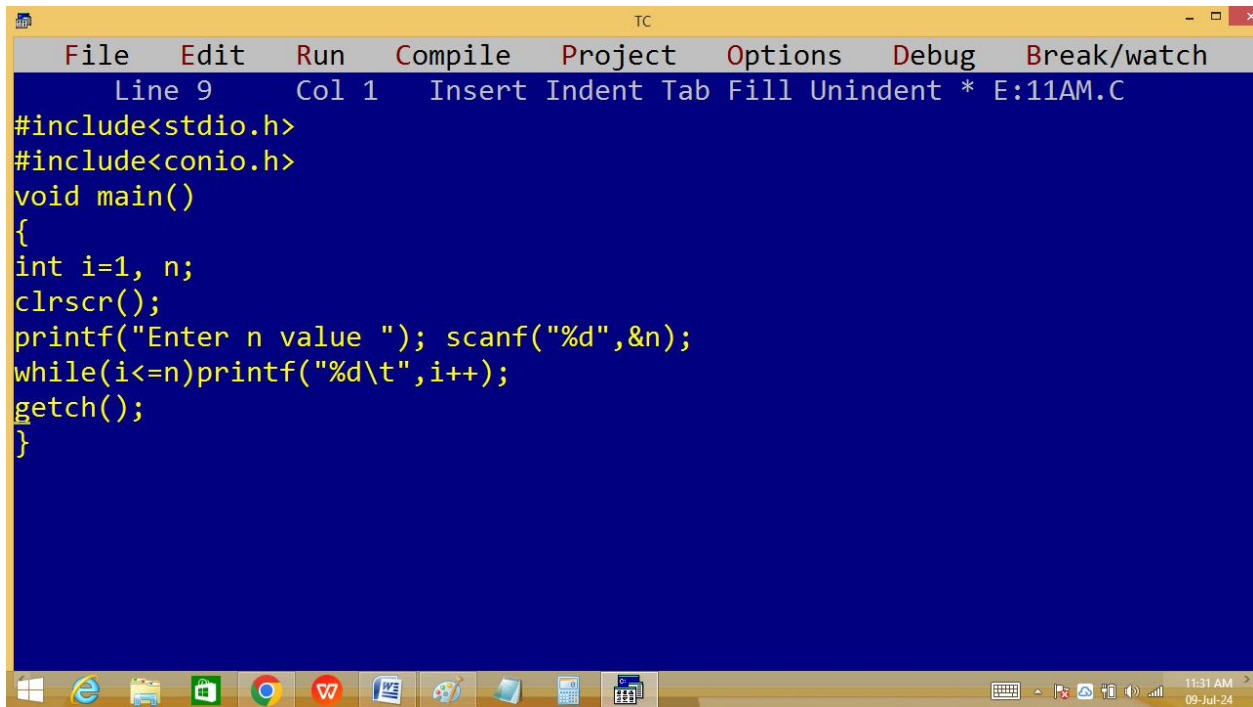


The screenshot shows a Turbo C++ (TC) IDE window. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 8', 'Col 5', and 'Insert Indent Tab Fill Unindent * E:11AM.C'. The main editing area has a dark blue background with yellow text. The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1, n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
printf("%d\t",i);
i++;
}
getch();
}
```

The Windows taskbar is visible at the bottom, showing icons for various applications and the system clock displaying 11:20 AM on 09-Jul-24.

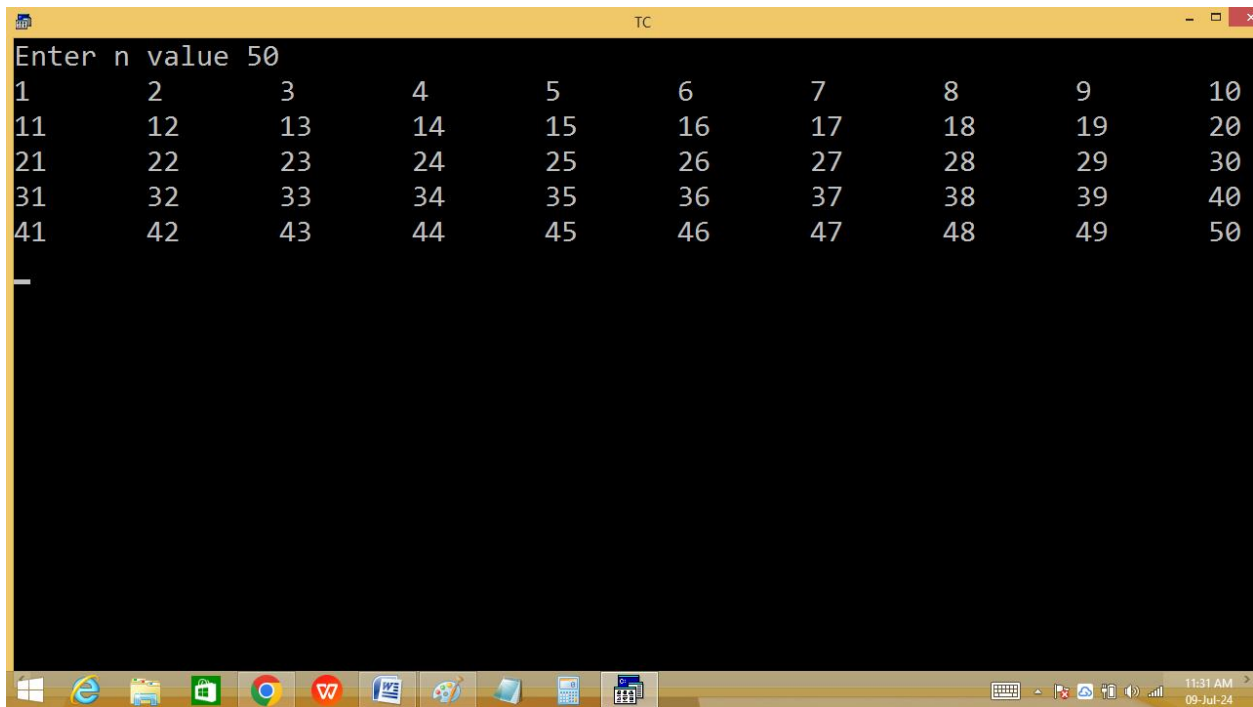




The screenshot shows the Turbo C++ (TC) IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a status bar (Line 9, Col 1, Insert, Indent, Tab, Fill, Unindent, * E:11AM.C). The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1, n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)printf("%d\t",i++);
getch();
}
```

The Windows taskbar at the bottom shows icons for various applications and the system clock indicating 11:31 AM on 09-Jul-24.

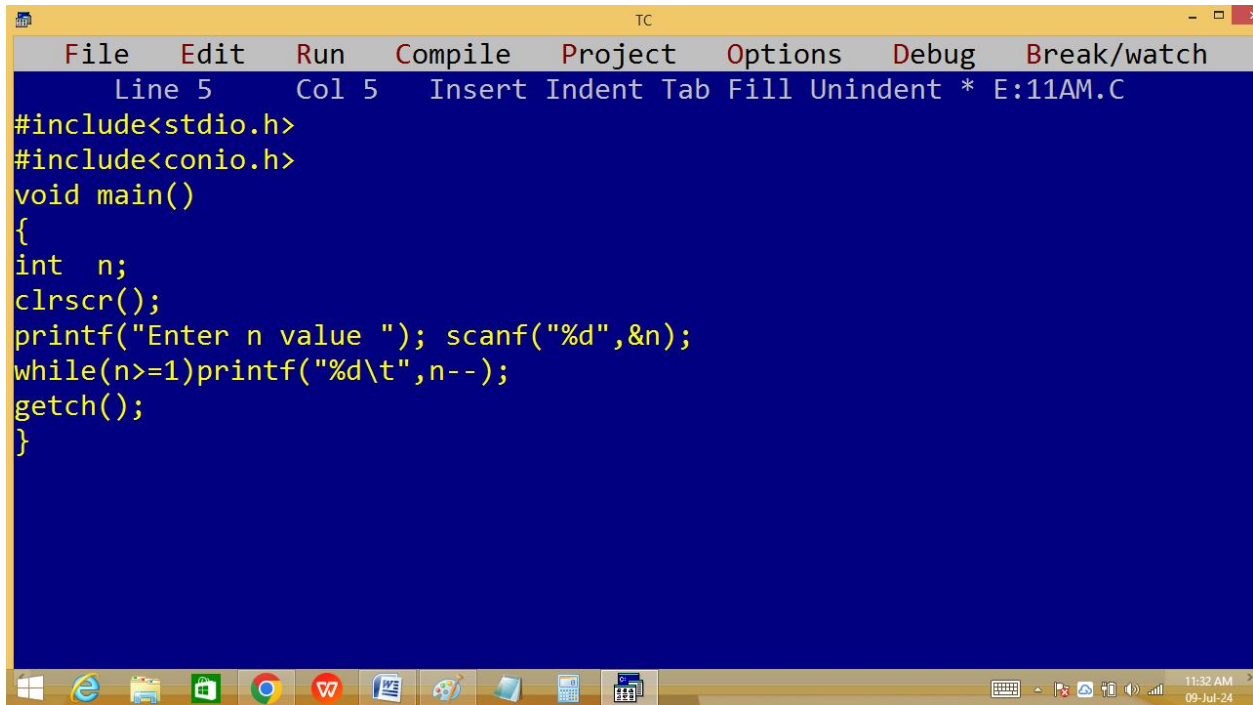


The screenshot shows the Turbo C++ (TC) IDE displaying the output of the program. The prompt "Enter n value 50" has been entered, and the program has printed numbers 1 through 50 in a 5x10 grid format, separated by tabs. The output is as follows:

```
Enter n value 50
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
```

The Windows taskbar at the bottom shows icons for various applications and the system clock indicating 11:31 AM on 09-Jul-24.

1..n in reverse order:

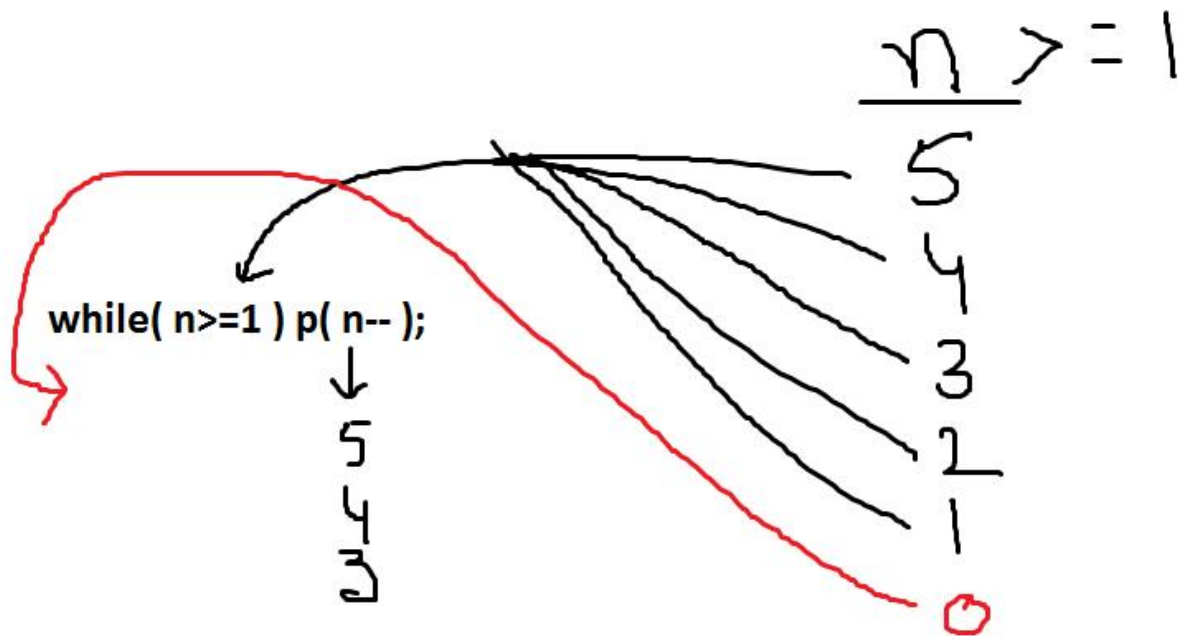


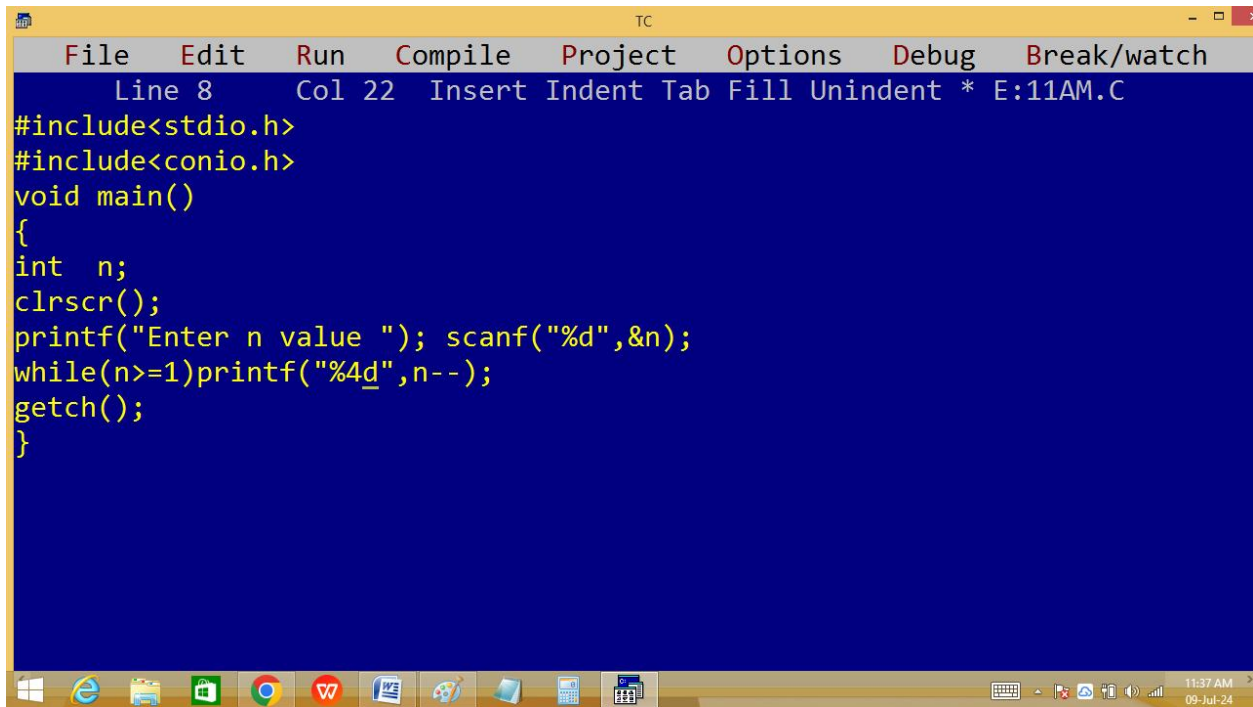
The screenshot shows the Turbo C++ (TC) IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 5', 'Col 5', and 'Insert' mode. The main editing area has a dark blue background with yellow text. The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(n>=1)printf("%d\t",n--);
    getch();
}
```

The Windows taskbar is visible at the bottom, showing icons for various applications and the system clock displaying 11:32 AM on 09-Jul-24.

```
TC
Enter n value 10
10  9  8  7  6  5  4  3  2  1
_
```

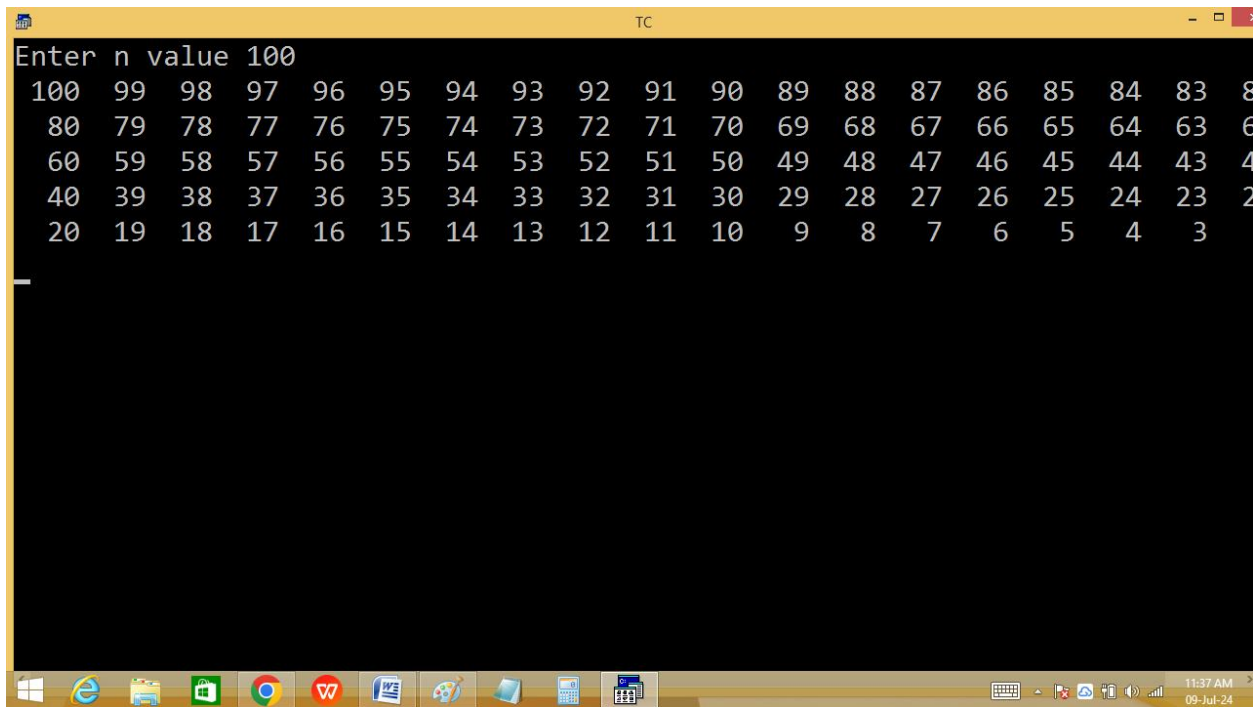




The screenshot shows the Turbo C++ (TC) IDE with a blue background. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 8 Col 22 Insert Indent Tab Fill Unindent * E:11AM.C'. The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(n>=1)printf("%4d",n--);
    getch();
}
```

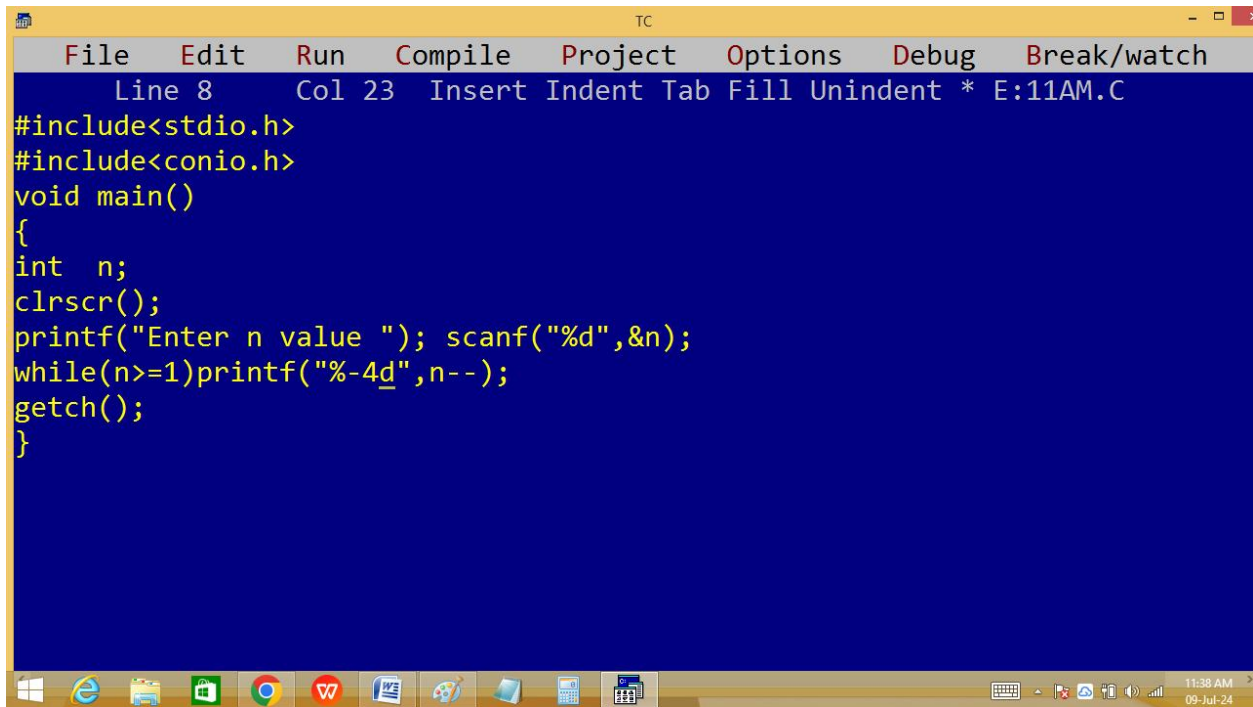
The Windows taskbar at the bottom shows various application icons and the system clock displaying 11:37 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with a black background, displaying the output of the program. The prompt 'Enter n value 100' is followed by a descending staircase pattern of numbers from 100 down to 1, with each number formatted with a width of 4 characters. The output is as follows:

```
Enter n value 100
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 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
```

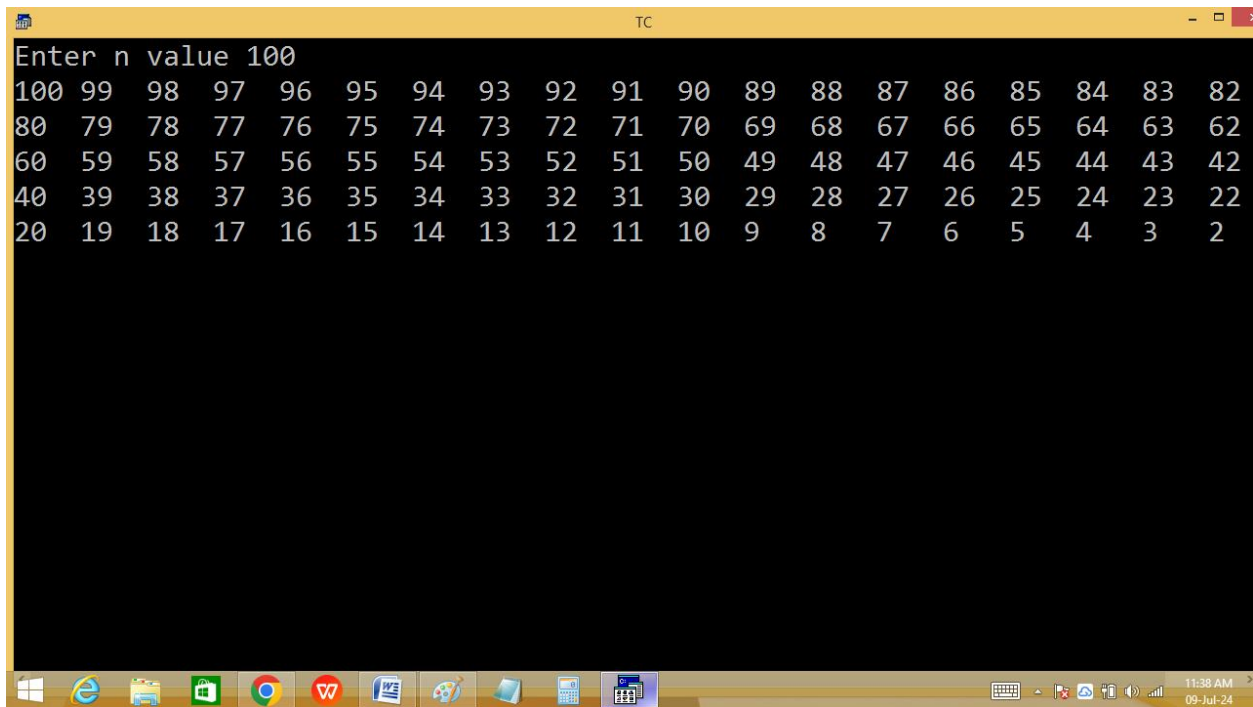
The Windows taskbar at the bottom shows various application icons and the system clock displaying 11:37 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with a blue background. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 8 Col 23 Insert Indent Tab Fill Unindent * E:11AM.C'. The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(n>=1)printf("%-4d",n--);
    getch();
}
```

The Windows taskbar at the bottom shows various icons including the Start button, Internet Explorer, File Explorer, and several other applications. The system clock in the bottom right corner shows 11:38 AM on 09-Jul-24.

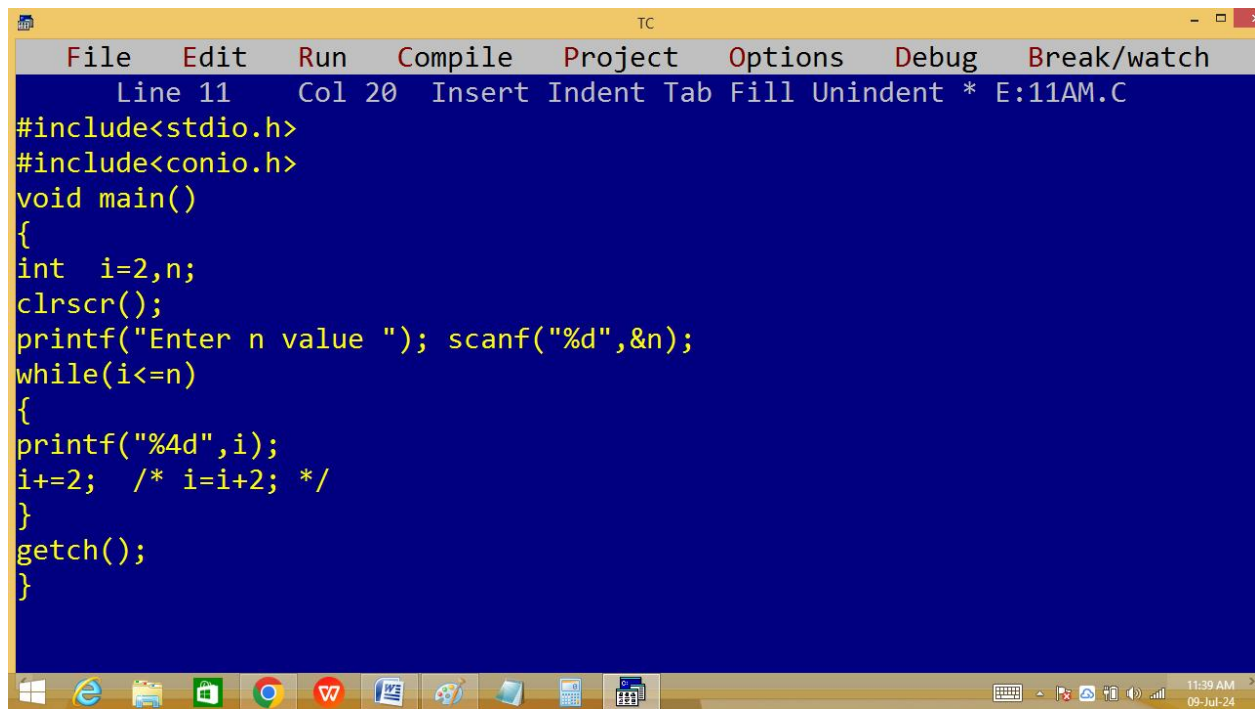


The screenshot shows the Turbo C++ (TC) IDE with a black background. The output of the program is displayed in the console window. The first line shows the prompt 'Enter n value' followed by the input '100'. The subsequent lines show the numbers from 100 down to 2, printed in a grid-like format with 10 columns and 10 rows. The numbers are right-aligned within each column.

```
Enter n value 100
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82
80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62
60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
```

The Windows taskbar at the bottom is identical to the first screenshot, showing the same set of icons and system clock.

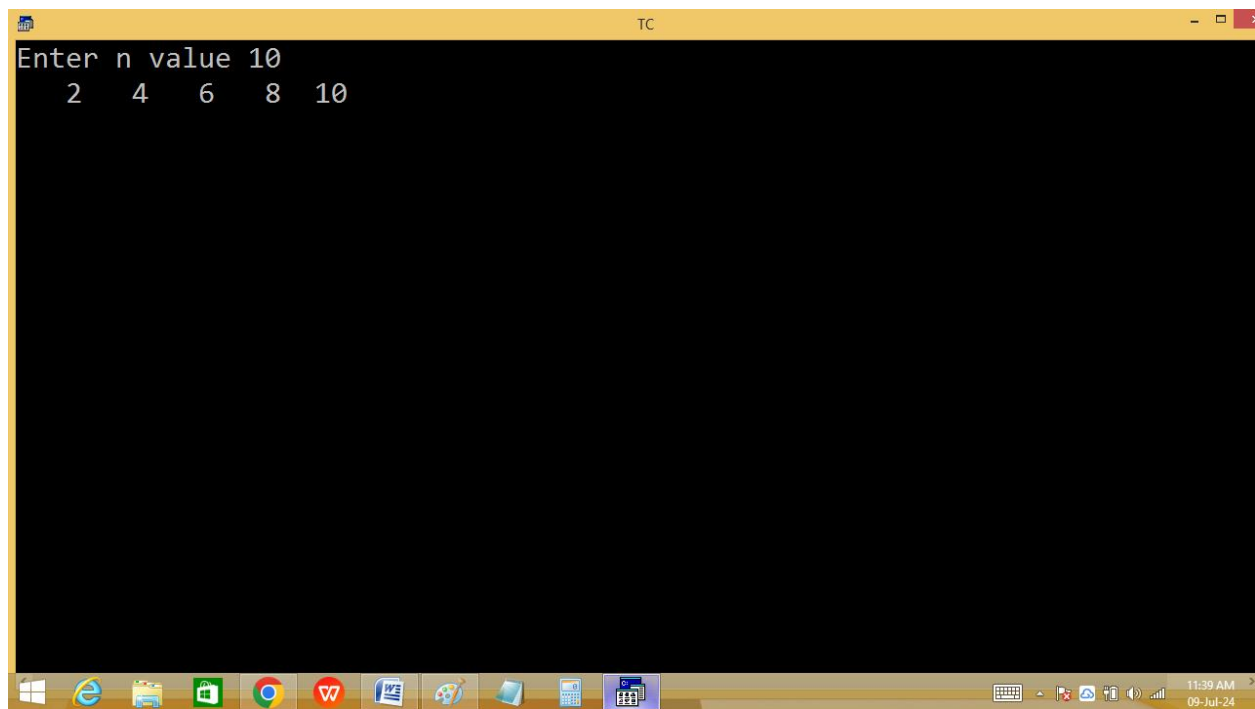
1..n even no':



The screenshot shows the Turbo C++ (TC) IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a status bar (Line 11, Col 20, Insert, Indent, Tab, Fill, Unindent, * E:11AM.C). The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=2,n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(i<=n)
    {
        printf("%4d",i);
        i+=2; /* i=i+2; */
    }
    getch();
}
```

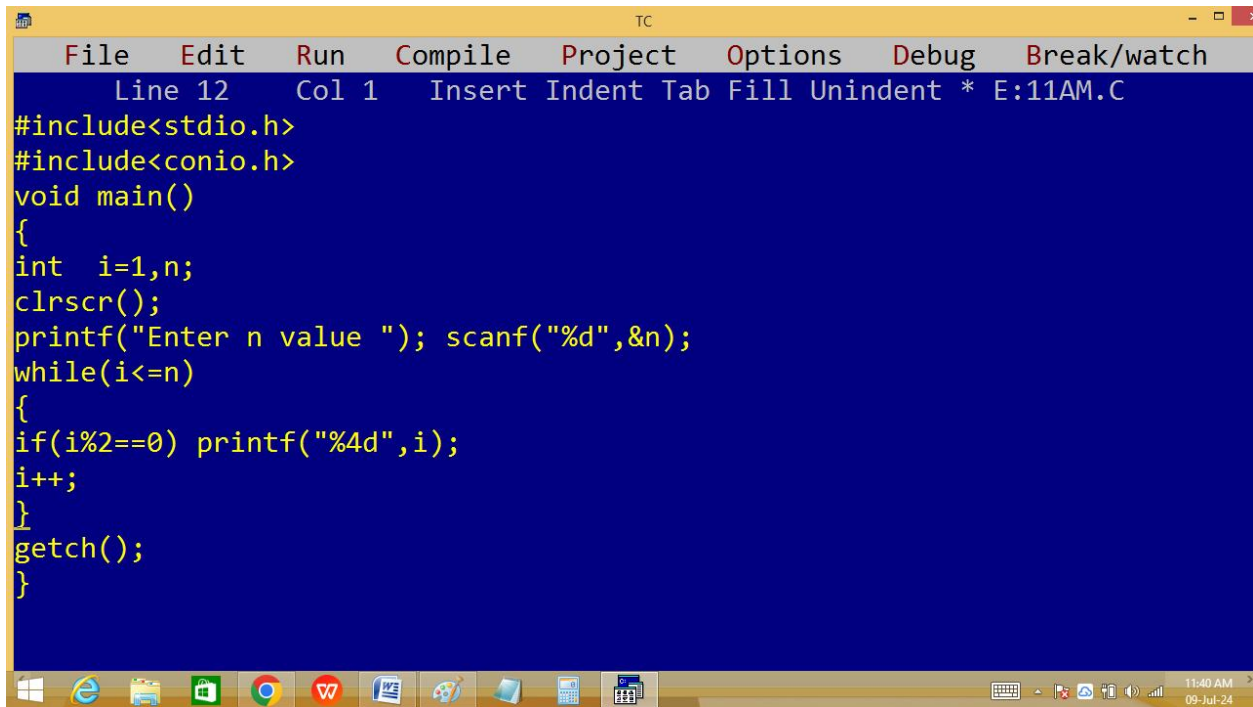
The Windows taskbar at the bottom shows the time as 11:39 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with the same menu bar and status bar. The output window displays the result of the program's execution:

```
Enter n value 10
    2    4    6    8   10
```

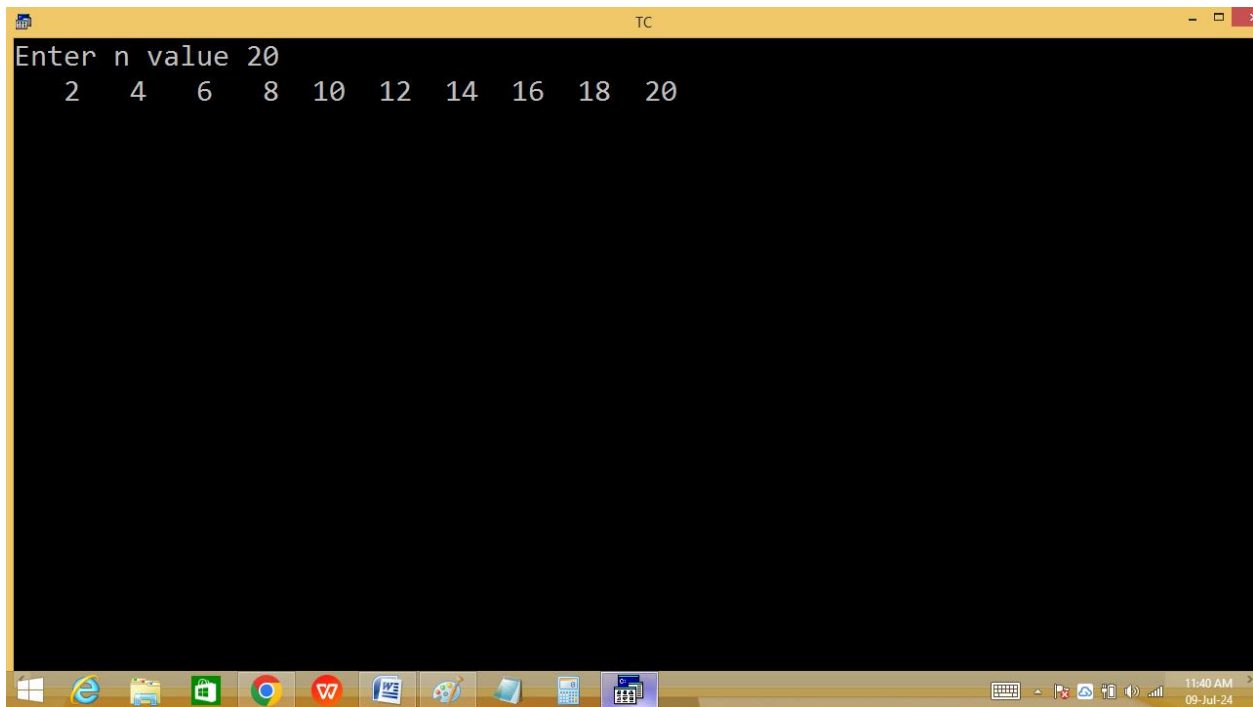
The Windows taskbar at the bottom shows the time as 11:39 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with a blue background. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 12 Col 1 Insert Indent Tab Fill Unindent * E:11AM.C'. The code is as follows:

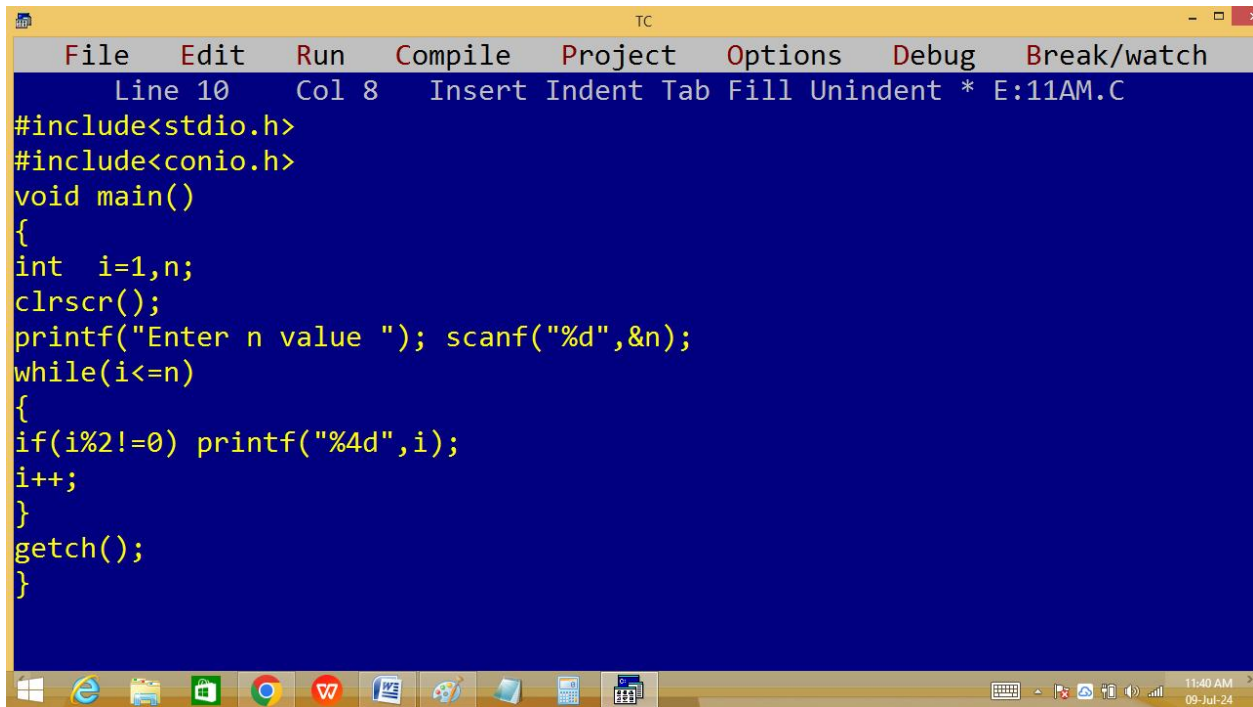
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=1,n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(i<=n)
    {
        if(i%2==0) printf("%4d",i);
        i++;
    }
    getch();
}
```

The Windows taskbar at the bottom shows the time as 11:40 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with a black background, displaying the output of the program. The text 'Enter n value 20' is on the first line. The second line displays the even numbers from 2 to 20, formatted with a width of 4 characters: '2 4 6 8 10 12 14 16 18 20'. The Windows taskbar at the bottom shows the time as 11:40 AM on 09-Jul-24.

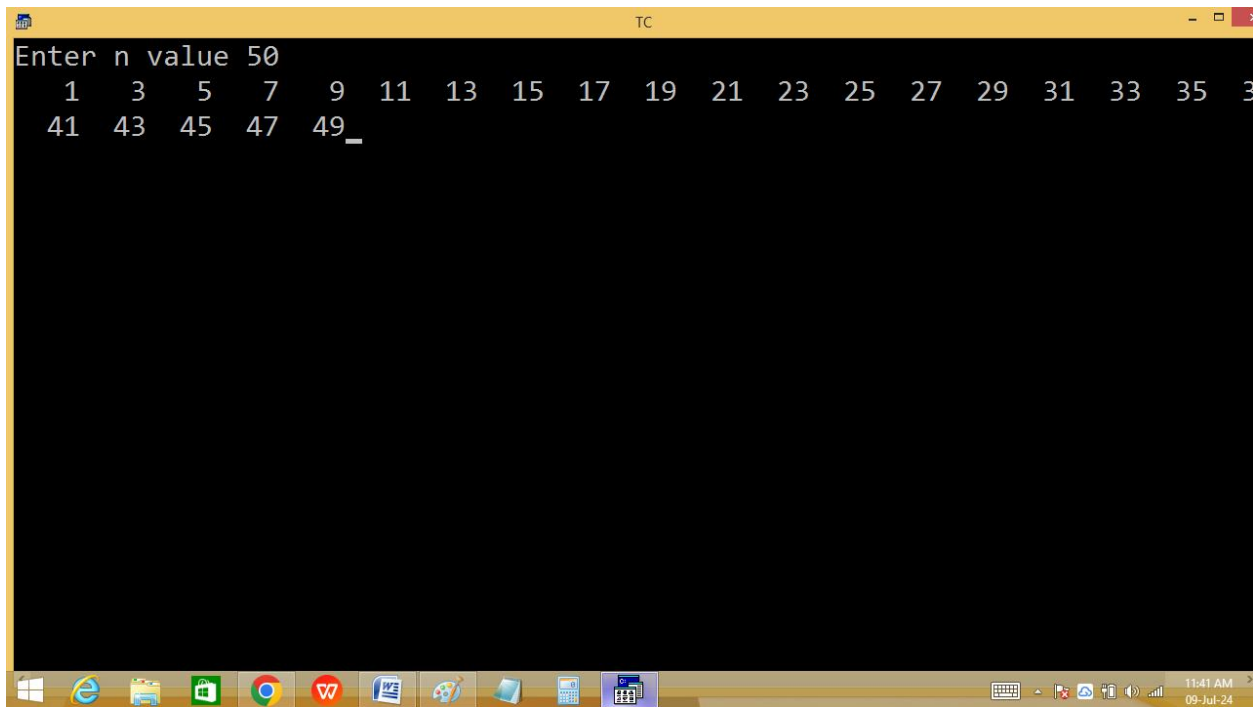
Odd numbers:



The screenshot shows the Turbo C++ (TC) IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a status bar (Line 10, Col 8, Insert, Indent, Tab, Fill, Unindent, *, E:11AM.C). The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=1,n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(i<=n)
    {
        if(i%2!=0) printf("%4d",i);
        i++;
    }
    getch();
}
```

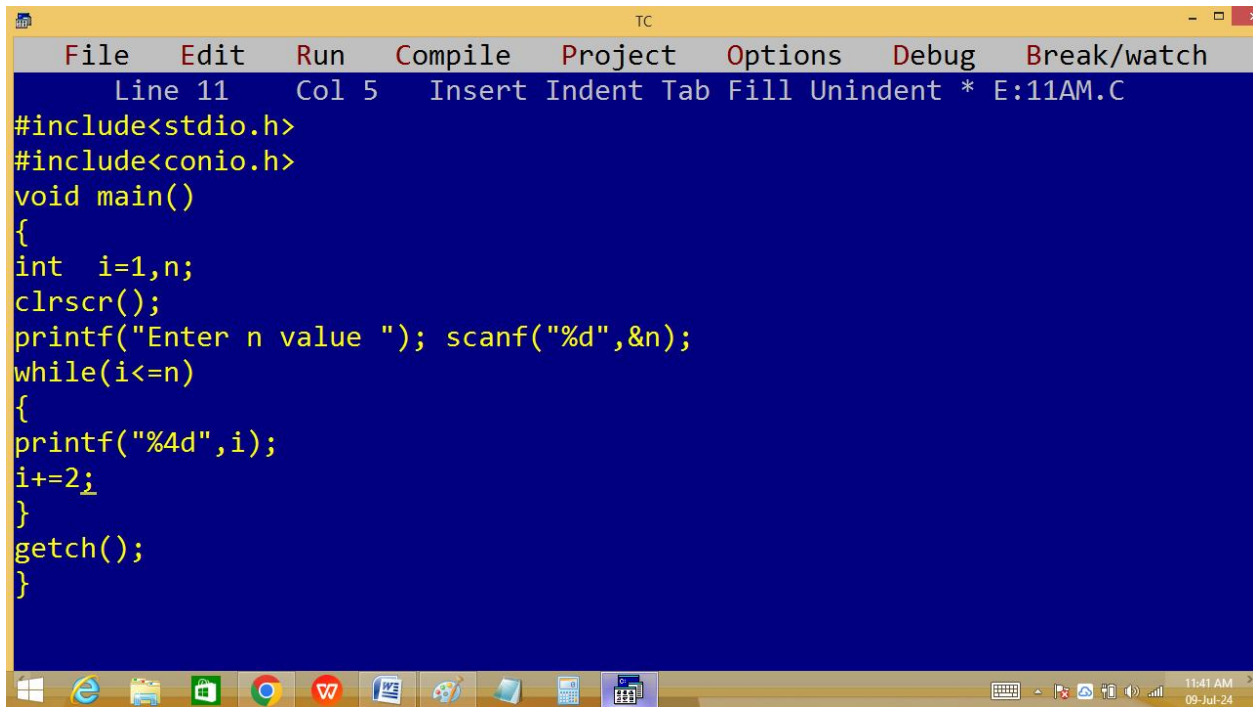
The Windows taskbar at the bottom shows the time as 11:40 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with the same menu bar and status bar. The output window displays the result of running the program with n=50:

```
Enter n value 50
 1  3  5  7  9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49_
```

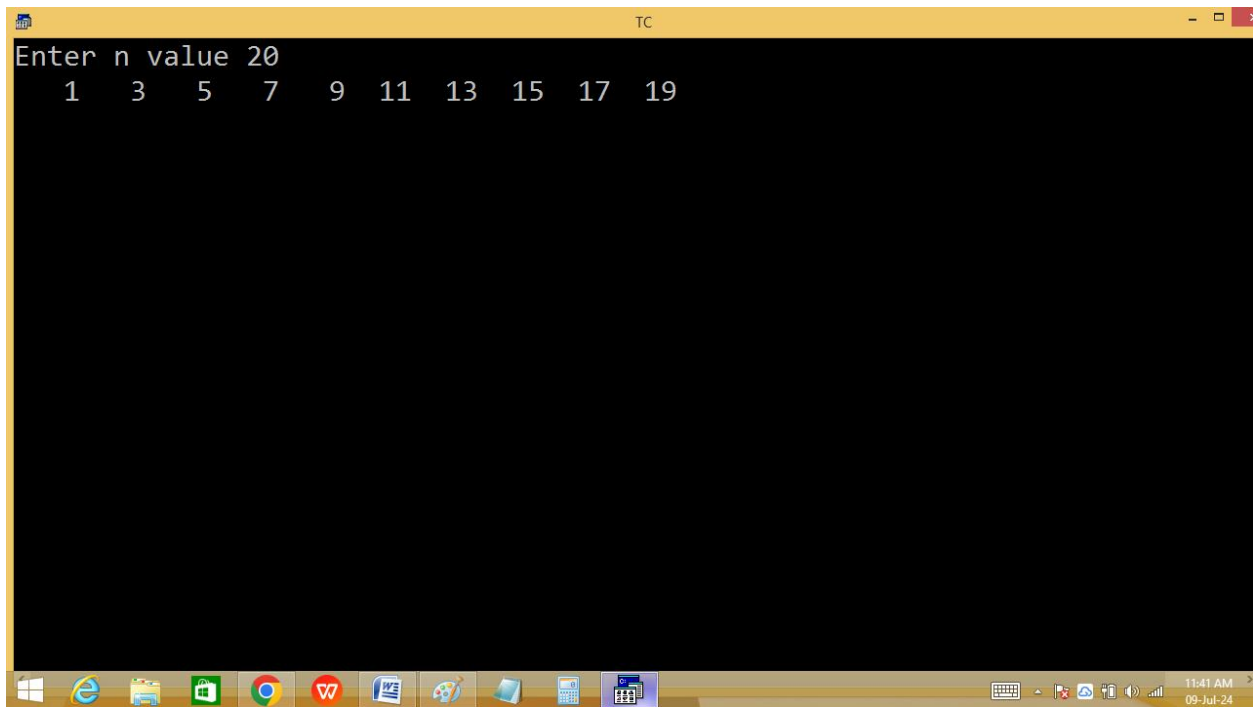
The Windows taskbar at the bottom shows the time as 11:41 AM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a status bar (Line 11, Col 5, Insert, Indent, Tab, Fill, Unindent, * E:11AM.C). The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=1,n;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(i<=n)
    {
        printf("%4d",i);
        i+=2;
    }
    getch();
}
```

The Windows taskbar at the bottom shows the time as 11:41 AM on 09-Jul-24.



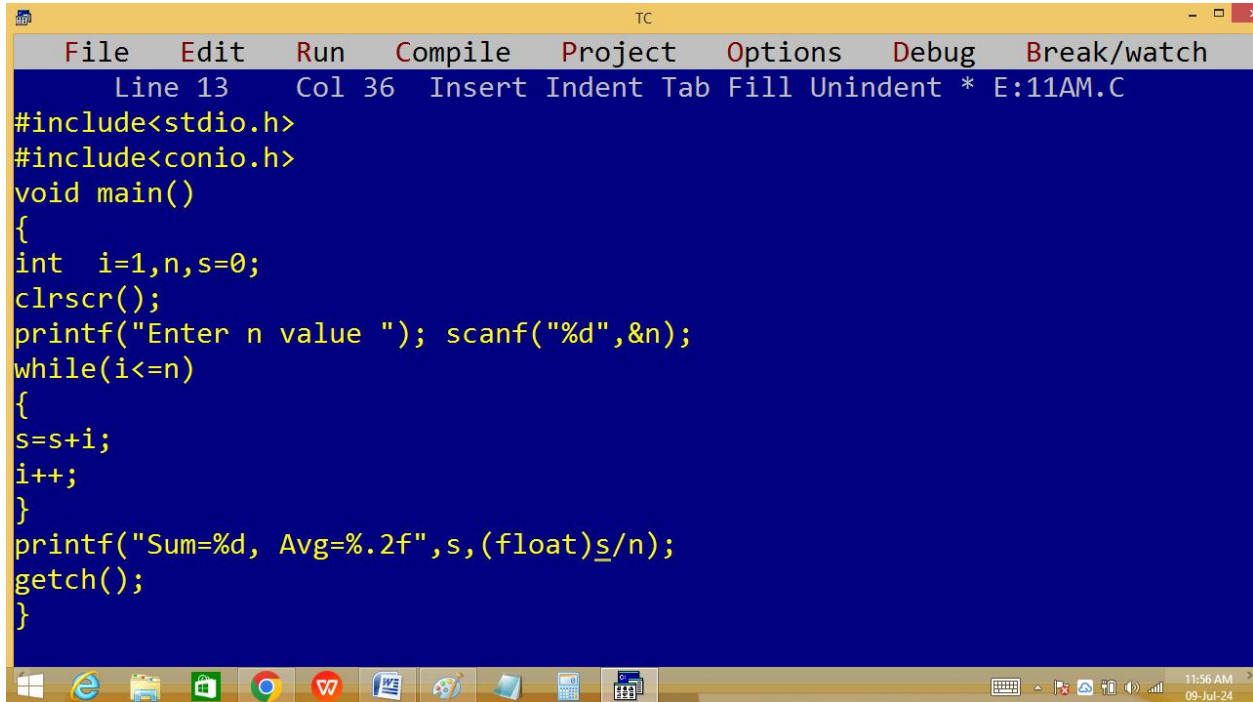
The screenshot shows the Turbo C++ (TC) IDE with the same menu bar and status bar. The output window displays the result of the program execution:

```
Enter n value 20
1  3  5  7  9 11 13 15 17 19
```

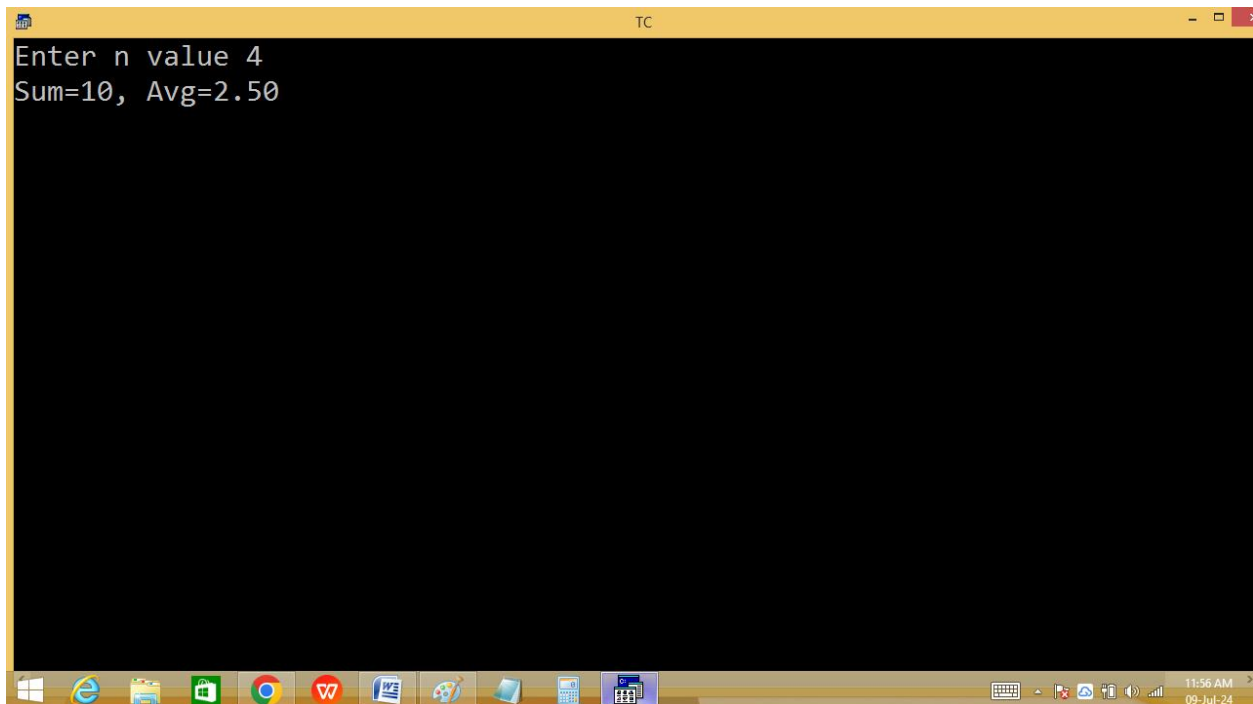
The Windows taskbar at the bottom shows the time as 11:41 AM on 09-Jul-24.

Finding 1..n numbers sum and avg [mean]:

Eg: $n=5 \rightarrow 1+2+3+4+5=15 \leftarrow \text{sum} \rightarrow 15/5=3 \leftarrow \text{avg}$

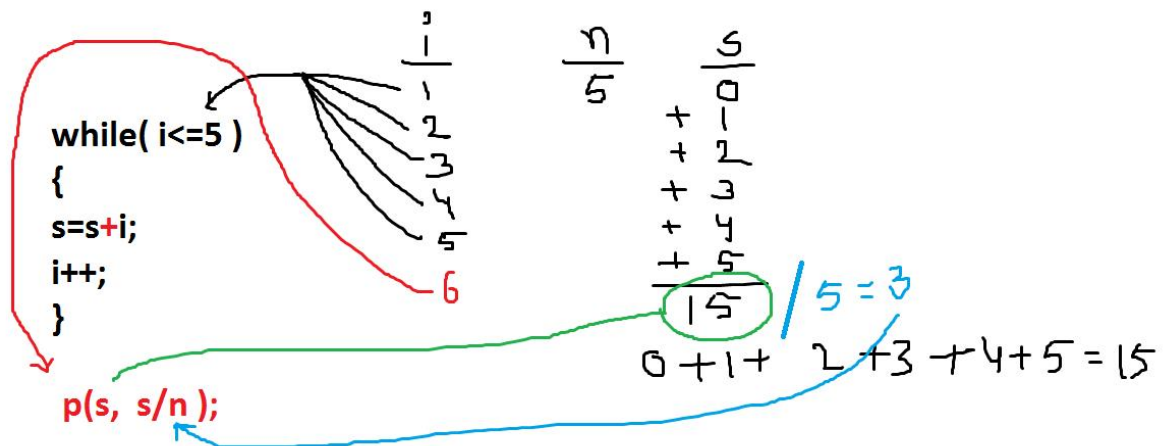


```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 36 Insert Indent Tab Fill Unindent * E:11AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=1,n,s=0;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    while(i<=n)
    {
        s=s+i;
        i++;
    }
    printf("Sum=%d, Avg=%.2f",s,(float)s/n);
    getch();
}
```



```
TC
Enter n value 4
Sum=10, Avg=2.50
```

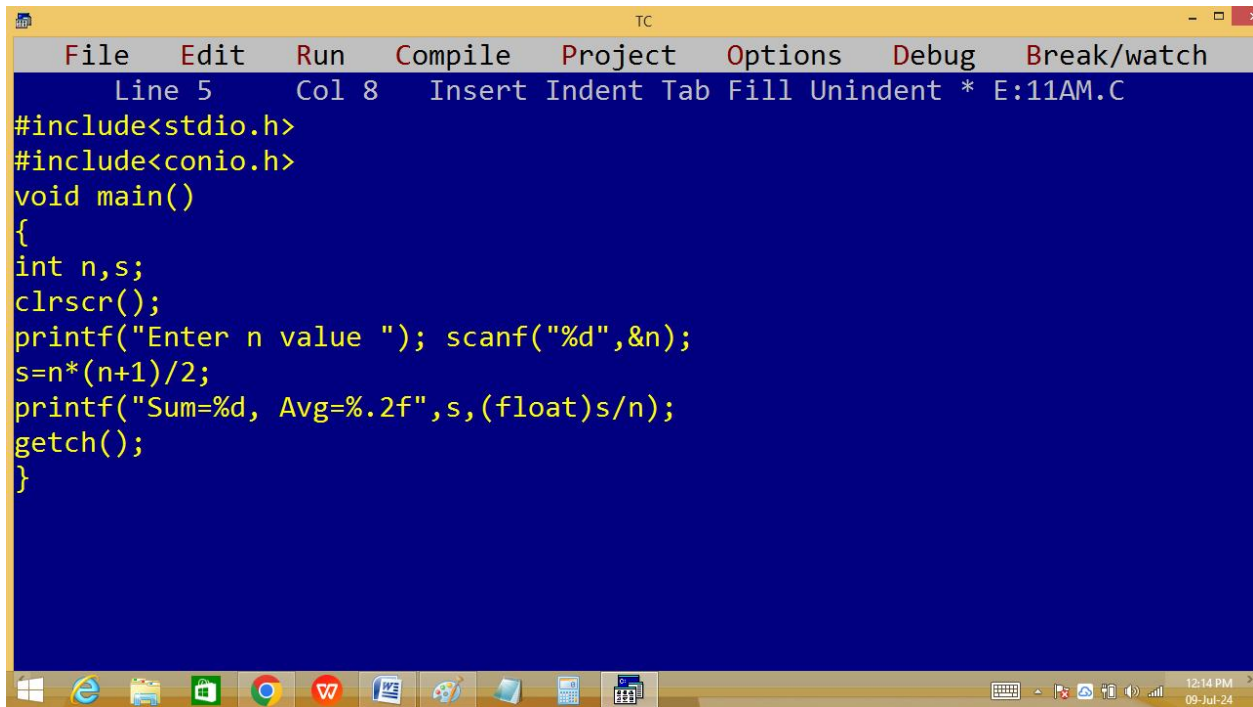
```
Enter n value 5
Sum=15, Avg=3.00_
```



Without loop:

$$s = n*(n+1)/2;$$

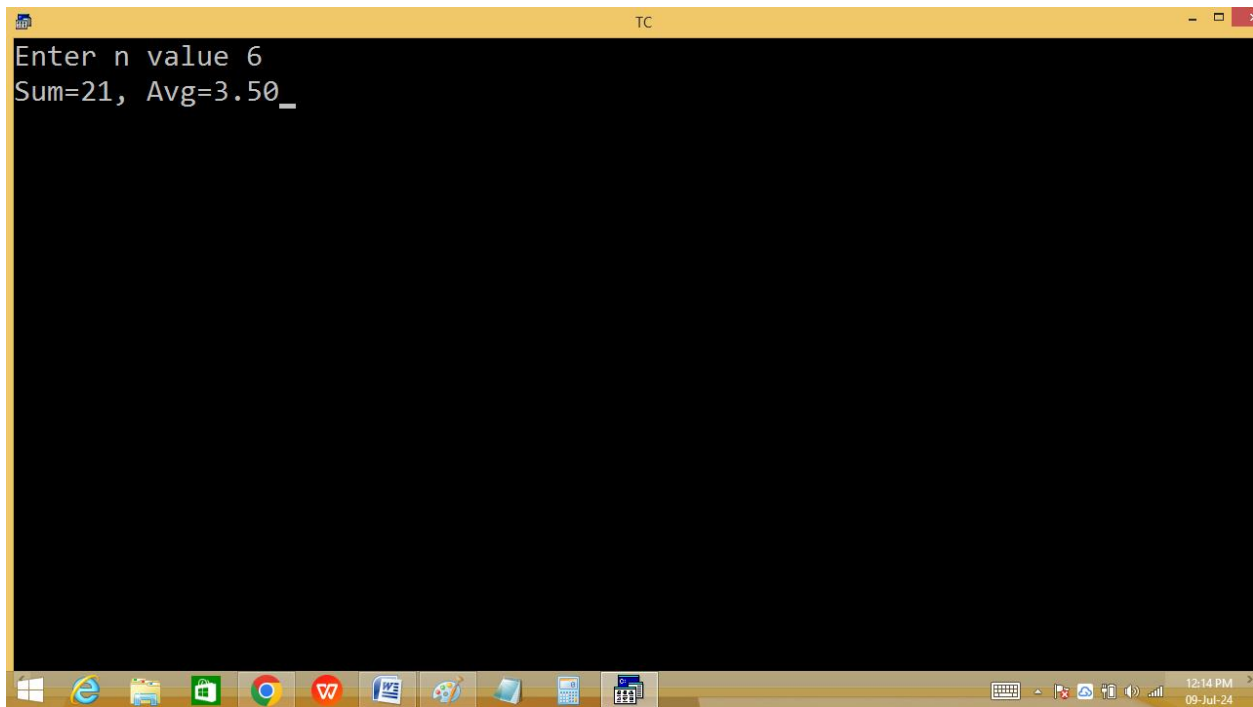
$$s = 4*(4+1)/2 \rightarrow 4*5/2=10$$



The screenshot shows the Turbo C++ (TC) IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a status bar (Line 5, Col 8, Insert, Indent, Tab, Fill, Unindent, *, E:11AM.C). The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,s;
clrscr();
printf("Enter n value "); scanf("%d",&n);
s=n*(n+1)/2;
printf("Sum=%d, Avg=%.2f",s,(float)s/n);
getch();
}
```

The Windows taskbar at the bottom shows the Start button and several application icons, including Internet Explorer, File Explorer, Google Chrome, and Word. The system clock in the bottom right corner displays 12:14 PM on 09-Jul-24.



The screenshot shows the Turbo C++ (TC) IDE with the same menu bar and status bar as the first image. The output window displays the results of the program's execution:

```
Enter n value 6
Sum=21, Avg=3.50_
```

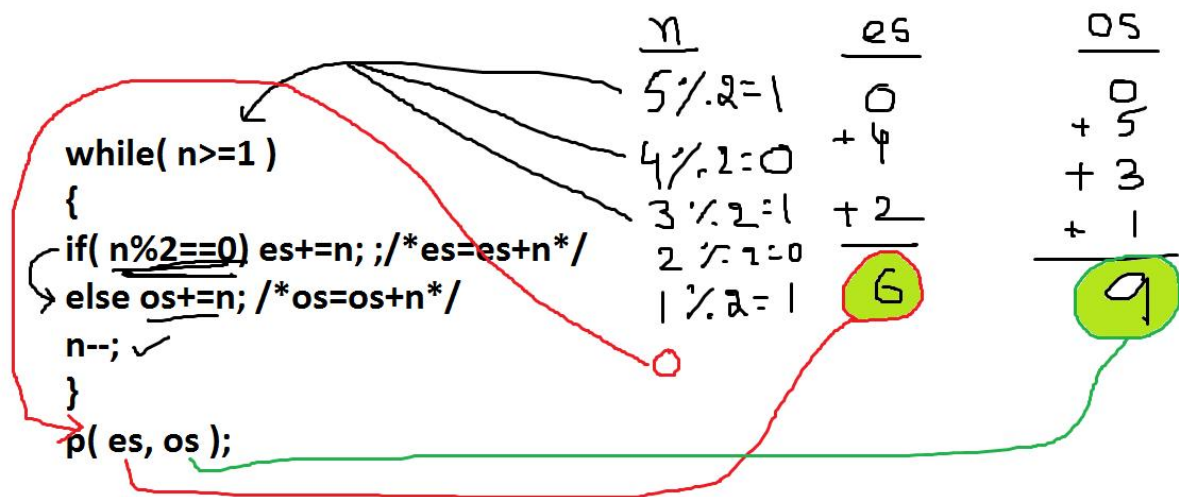
The Windows taskbar at the bottom is identical to the first image, showing the same application icons and system clock (12:14 PM on 09-Jul-24).

Finding 1..n even, odd numbers sum:

$$5 < \begin{matrix} 2 + 4 = 6 \\ 1 + 3 + 5 = 9 \end{matrix}$$

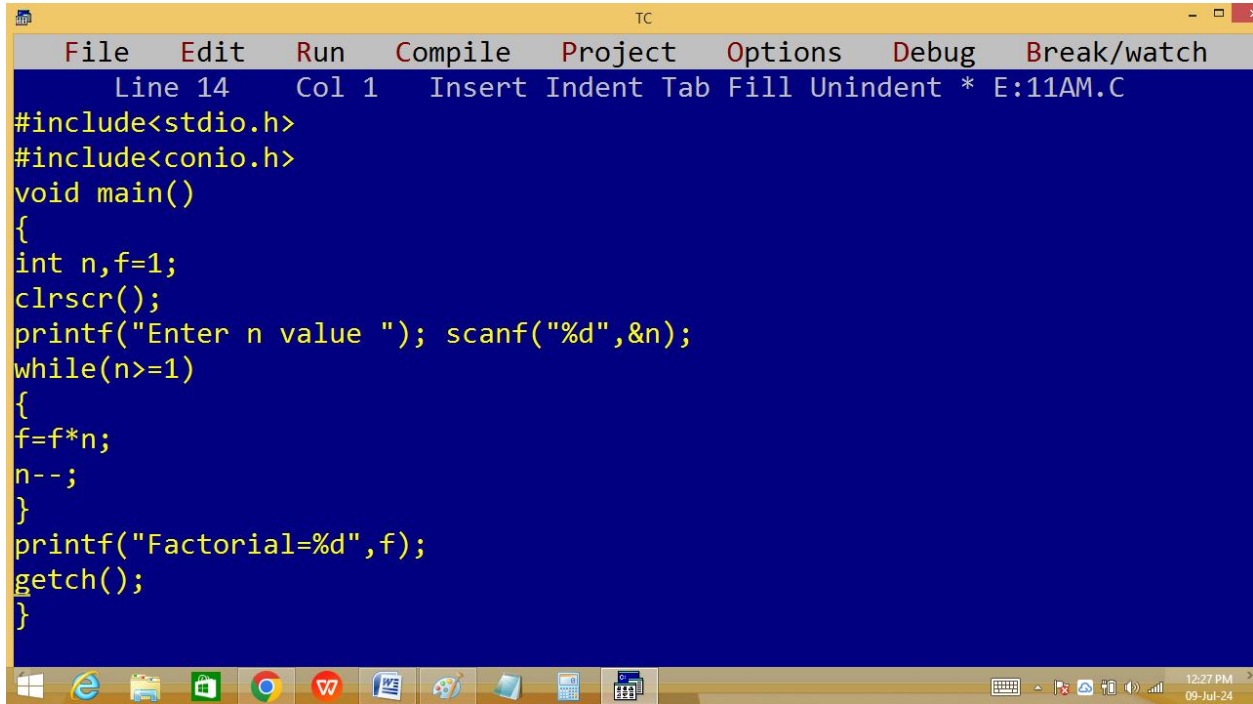
```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 39 Insert Indent Tab Fill Unindent * E:11AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n,es=0, os=0;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(n>=1)
{
if(n%2==0) es+=n;
else os+=n;
n--;
}
printf("Even Sum=%d, Odd Sum=%d",es,os);
getch();
}
```

```
Enter n value 5
Even Sum=6, Odd Sum=9
```

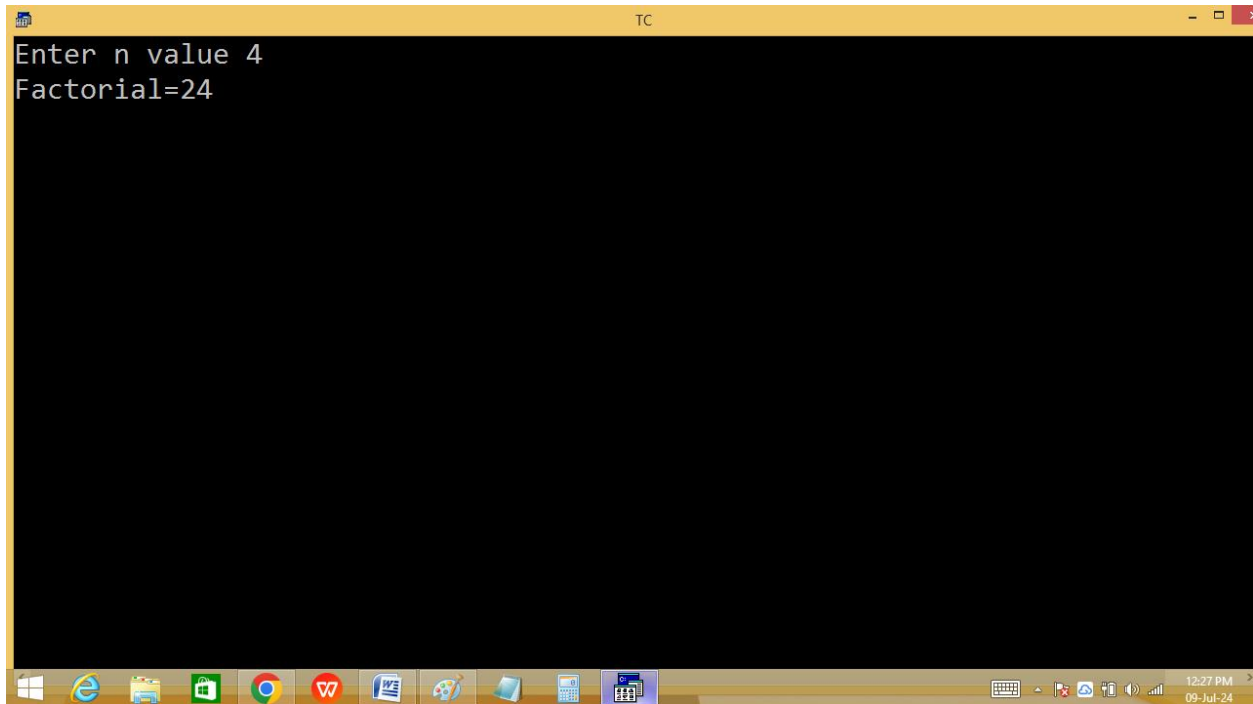


Finding factorial of given no.

4 factorial is $4*3*2*1=24$

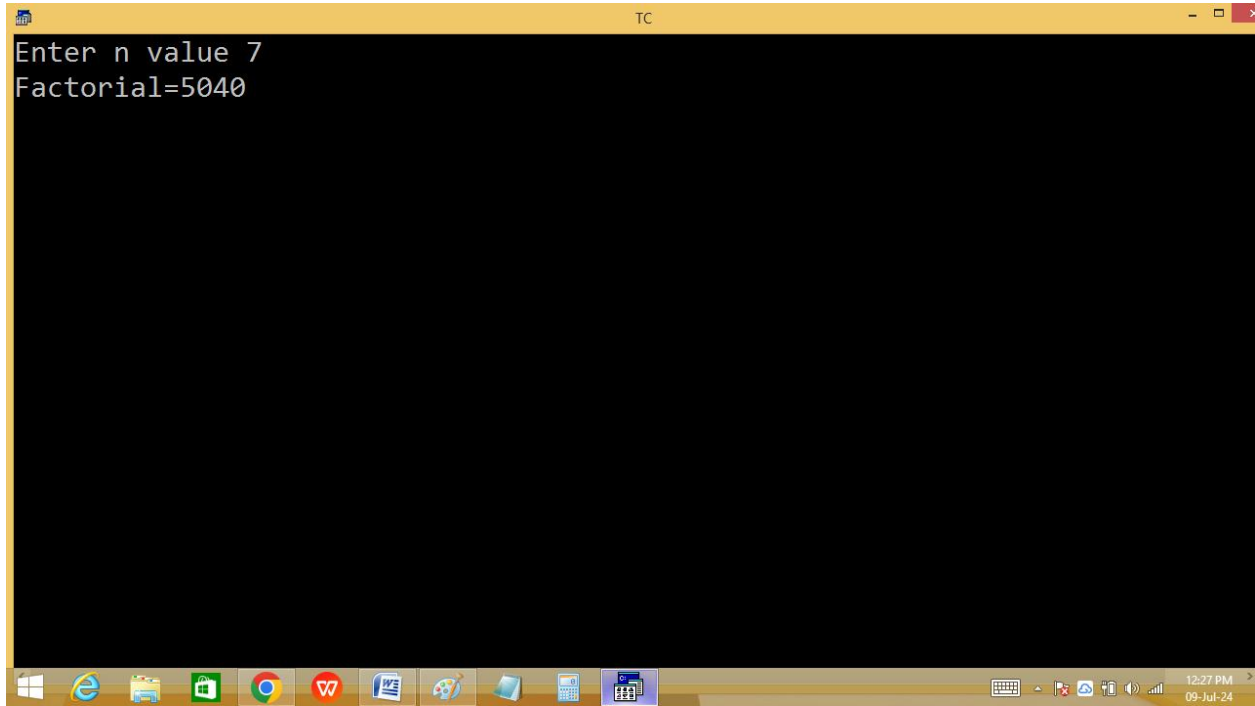


```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 1 Insert Indent Tab Fill Unindent * E:11AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n,f=1;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(n>=1)
{
f=f*n;
n--;
}
printf("Factorial=%d",f);
getch();
}
```

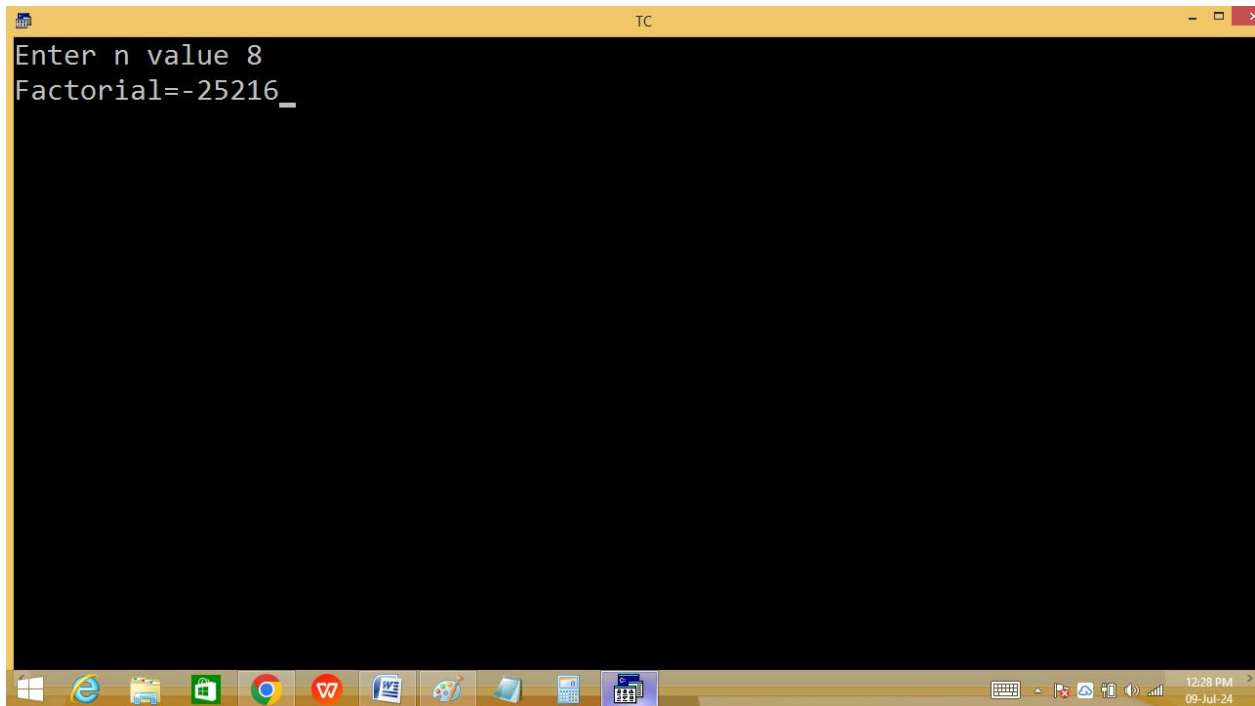


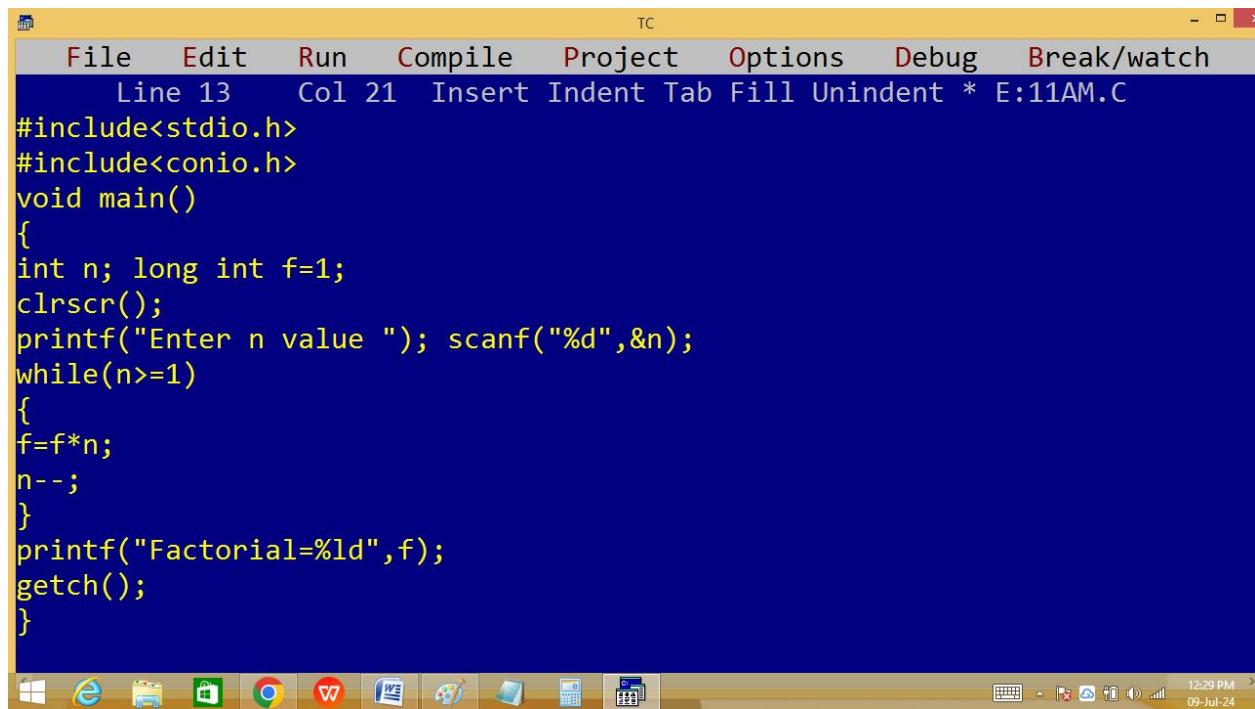
```
TC
Enter n value 4
Factorial=24
```

```
TC
Enter n value 7
Factorial=5040
```

A screenshot of a Turbo C++ (TC) IDE window. The title bar is yellow and contains the text "TC". The main window has a black background with white text. The first line of text is "Enter n value 7" and the second line is "Factorial=5040". The Windows taskbar is visible at the bottom, showing various application icons and the system clock indicating 12:27 PM on 09-Jul-24.

```
TC
Enter n value 8
Factorial=-25216_
```

A screenshot of a Turbo C++ (TC) IDE window. The title bar is yellow and contains the text "TC". The main window has a black background with white text. The first line of text is "Enter n value 8" and the second line is "Factorial=-25216_". The Windows taskbar is visible at the bottom, showing various application icons and the system clock indicating 12:28 PM on 09-Jul-24.

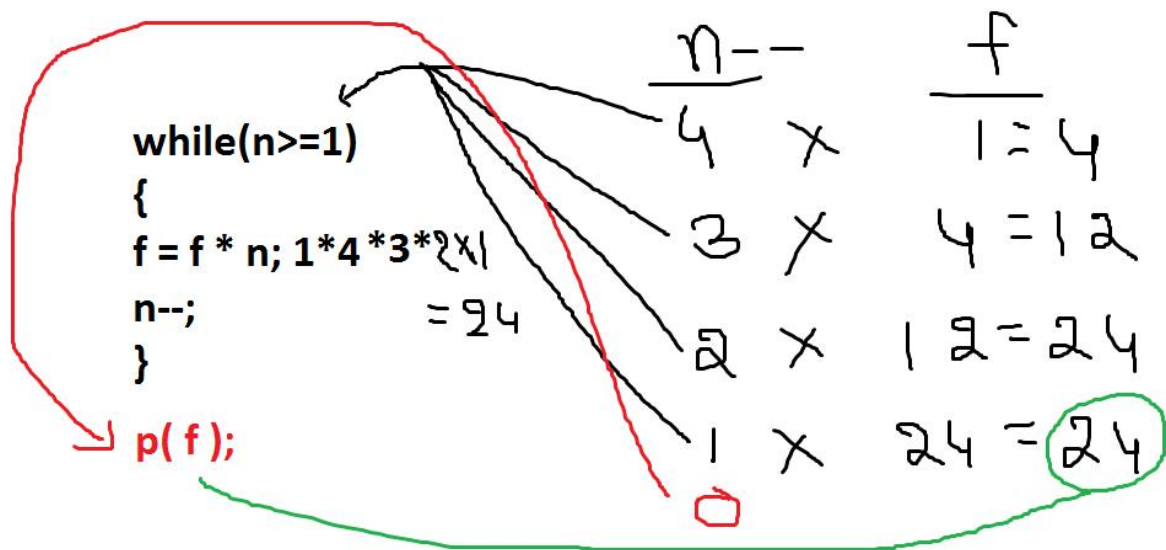


The image shows a screenshot of the Turbo C++ (TC) IDE. The window title is "TC". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, the status bar shows "Line 13", "Col 21", and "Insert Indent Tab Fill Unindent * E:11AM.C". The main editing area has a dark blue background with yellow text. The code is a C program to calculate the factorial of a number 'n'. The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n; long int f=1;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(n>=1)
{
f=f*n;
n--;
}
printf("Factorial=%ld",f);
getch();
}
```

The Windows taskbar is visible at the bottom, showing icons for Windows, Internet Explorer, File Explorer, Microsoft Word, Google Chrome, and other applications. The system clock in the bottom right corner shows "12:29 PM" and "09-Jul-24".

```
TC
Enter n value 8
Factorial=40320_
```



Finding power using user defined program.

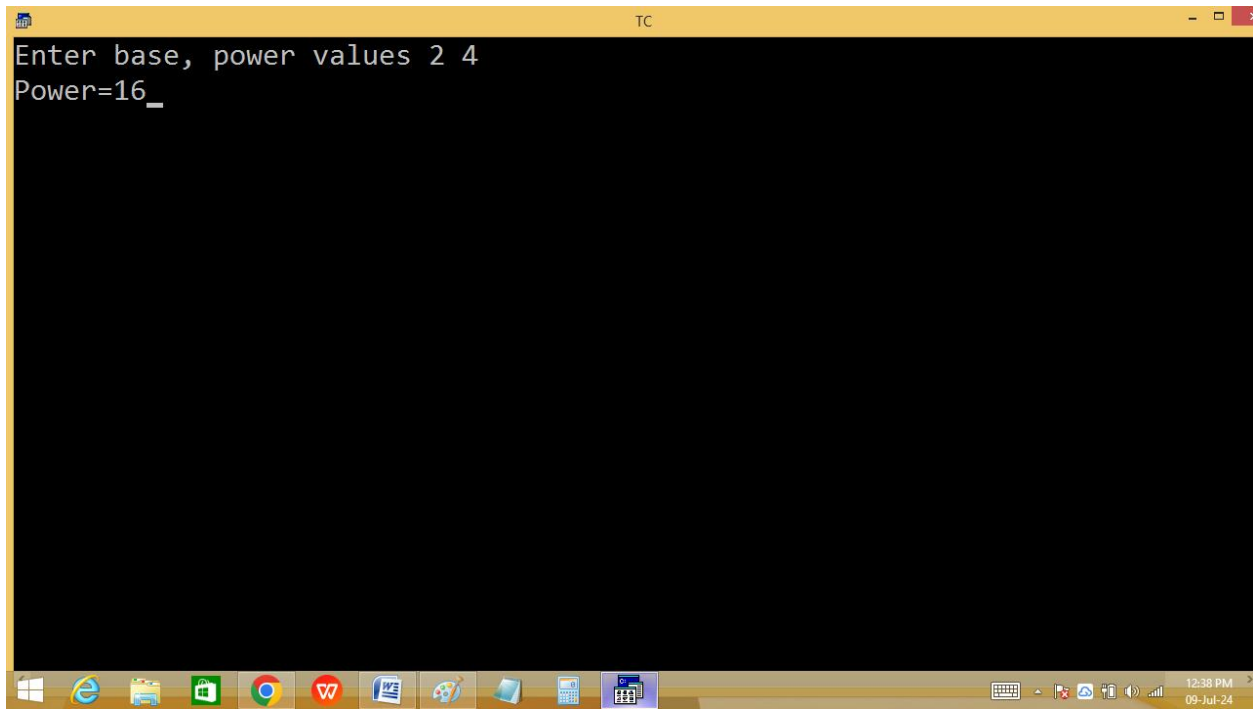
$$2^4 = 16$$

Handwritten calculation showing the process of finding power:

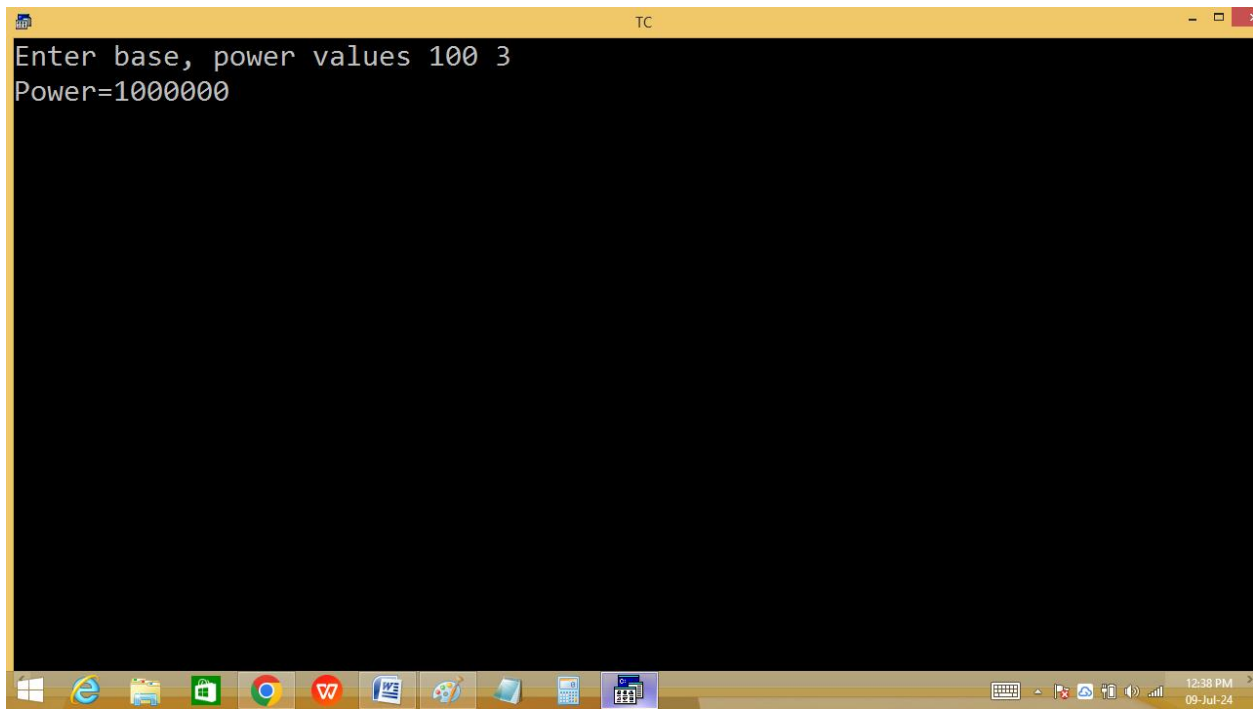
$$B \swarrow \begin{matrix} 4 & - & P \\ 2 & & \end{matrix} = 16 \leftarrow R$$
$$100^3 = 10L$$

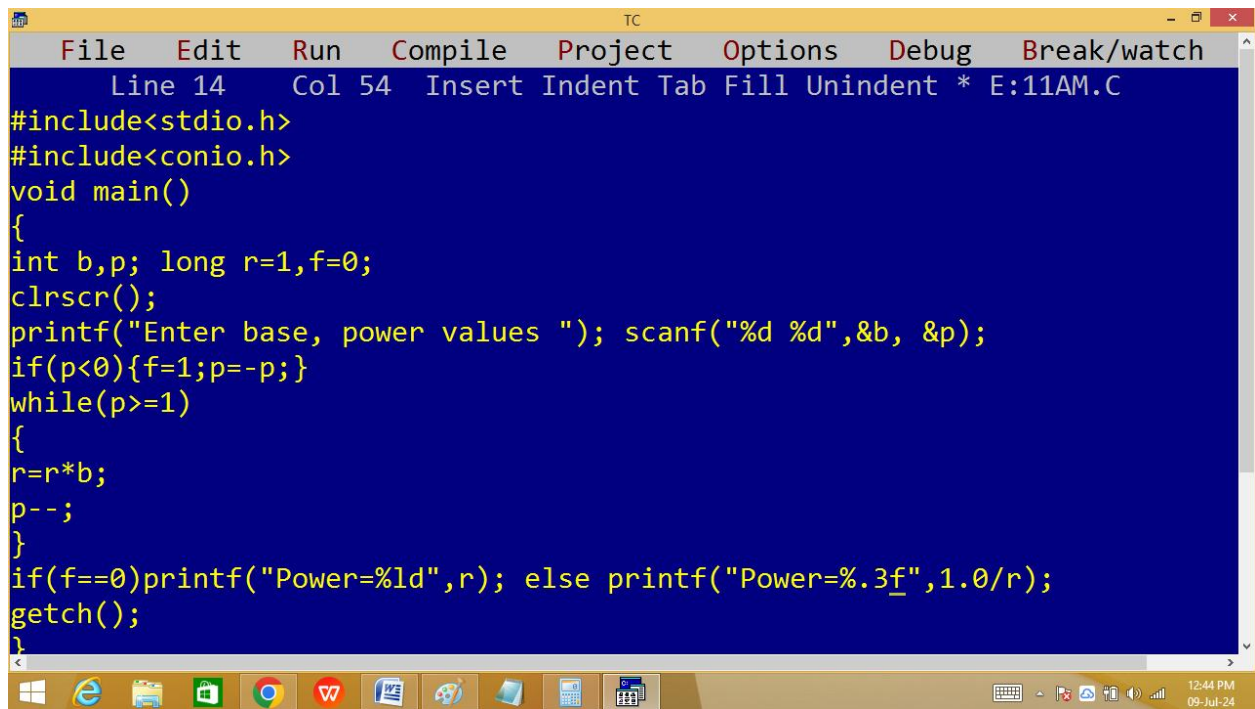
```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 21 Insert Indent Tab Fill Unindent * E:11AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long r=1;
clrscr();
printf("Enter base, power values "); scanf("%d %d",&b, &p);
while(p>=1)
{
r=r*b;
p--;
}
printf("Power=%ld",r);
getch();
}
```

```
TC
Enter base, power values 2 4
Power=16_
```

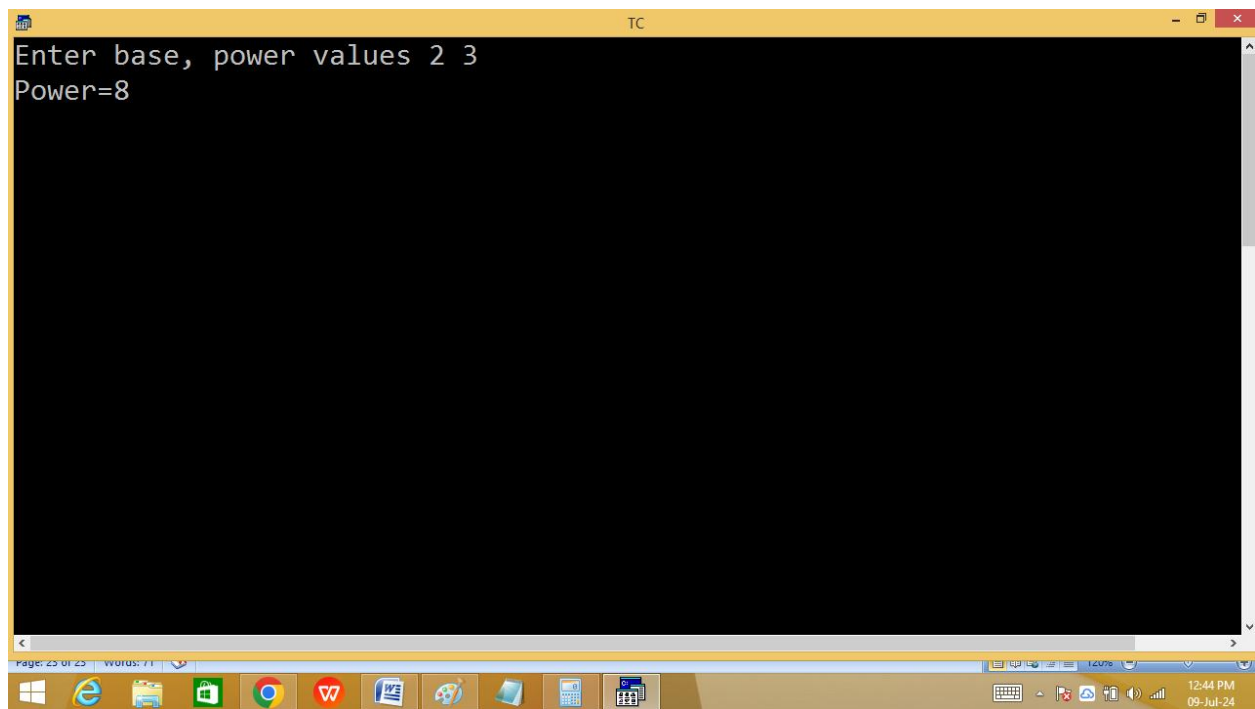


```
TC
Enter base, power values 100 3
Power=1000000
```



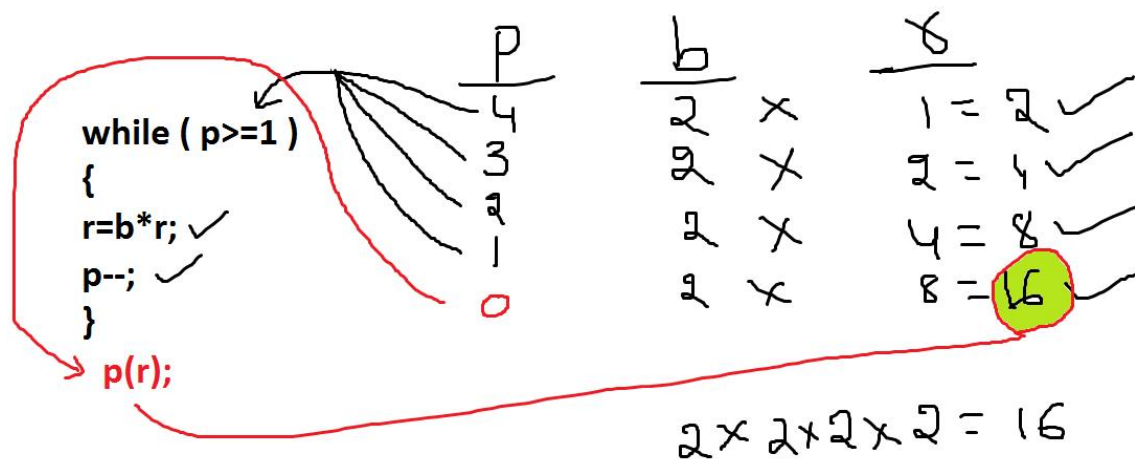


```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 54 Insert Indent Tab Fill Unindent * E:11AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long r=1,f=0;
clrscr();
printf("Enter base, power values "); scanf("%d %d",&b, &p);
if(p<0){f=1;p=-p;}
while(p>=1)
{
r=r*b;
p--;
}
if(f==0)printf("Power=%ld",r); else printf("Power=%.3f",1.0/r);
getch();
}
```



```
TC
Enter base, power values 2 3
Power=8
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```

```
Enter base, power values 2 -3
Power=0.125
```



Home work:

1.

$$2^4 \Rightarrow 2^1 + 2^2 + 2^3 + 2^4 = 30 \checkmark$$

