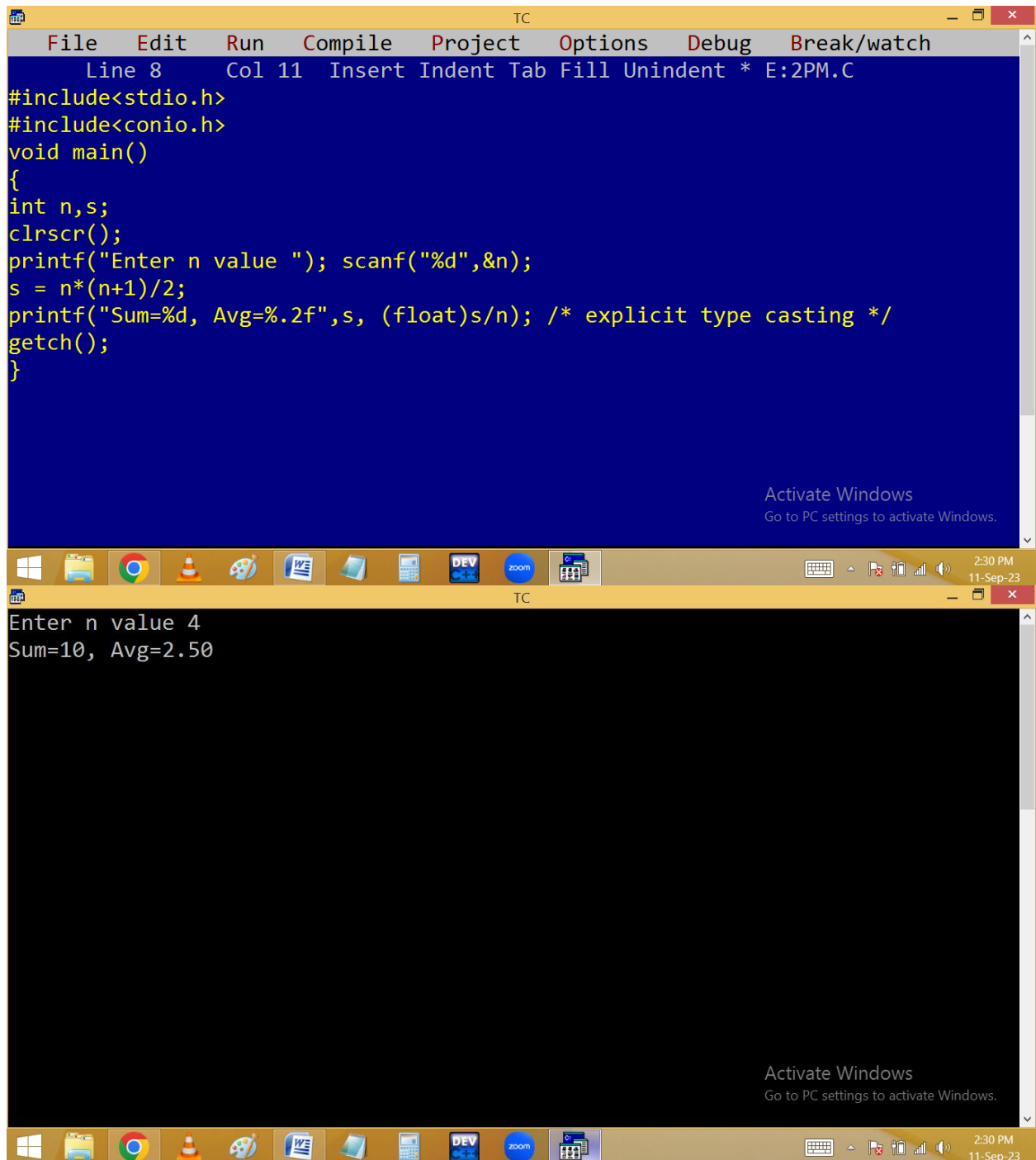


Finding 1..n numbers sum and mean without using loop:

$$n*(n+1)/2$$

$$n=4 \rightarrow 4 * 5 / 2 = 10$$



The screenshot displays the Turbo C++ (TC) IDE interface. The top window shows the source code for a C program named E:2PM.C. The code includes headers for `stdio.h` and `conio.h`, and defines a `main` function. Inside `main`, it declares variables `n` and `s`, clears the screen with `clrscr()`, prompts the user to enter a value for `n` using `scanf`, calculates the sum `s` using the formula `s = n*(n+1)/2`, and prints the sum and average using `printf`. The average is calculated as `(float)s/n` with an explicit type casting. The program then uses `getch()` to pause before exiting.

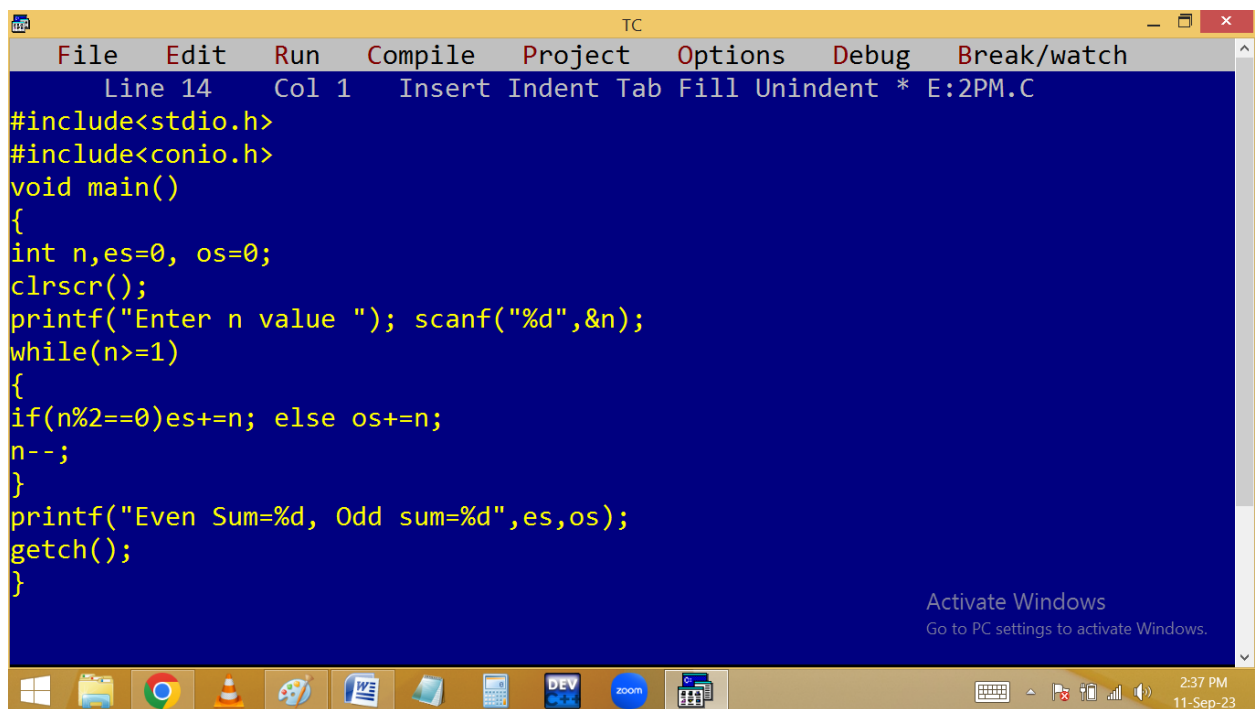
The bottom window shows the program's execution. It prompts "Enter n value 4", and the output is "Sum=10, Avg=2.50". The Windows taskbar at the bottom indicates the time is 2:30 PM on 11-Sep-23.

```
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 11 Insert Indent Tab Fill Unindent * E:2PM.C
#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); /* explicit type casting */
getch();
}
```

Enter n value 4
Sum=10, Avg=2.50

Finding 1..n numbers Even and odd sum:

$$n = 5 \quad \left\{ \begin{array}{l} 1 + 3 + 5 = 9 \\ 2 + 4 = 6 \end{array} \right.$$



```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 1 Insert Indent Tab Fill Unindent * E:2PM.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();
}
```

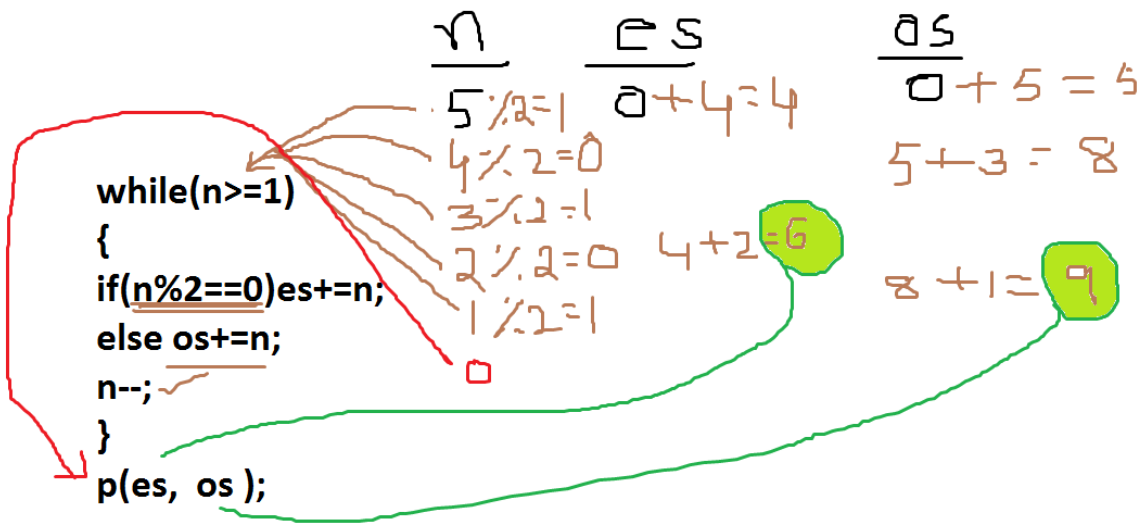
Activate Windows
Go to PC settings to activate Windows.

2:37 PM
11-Sep-23

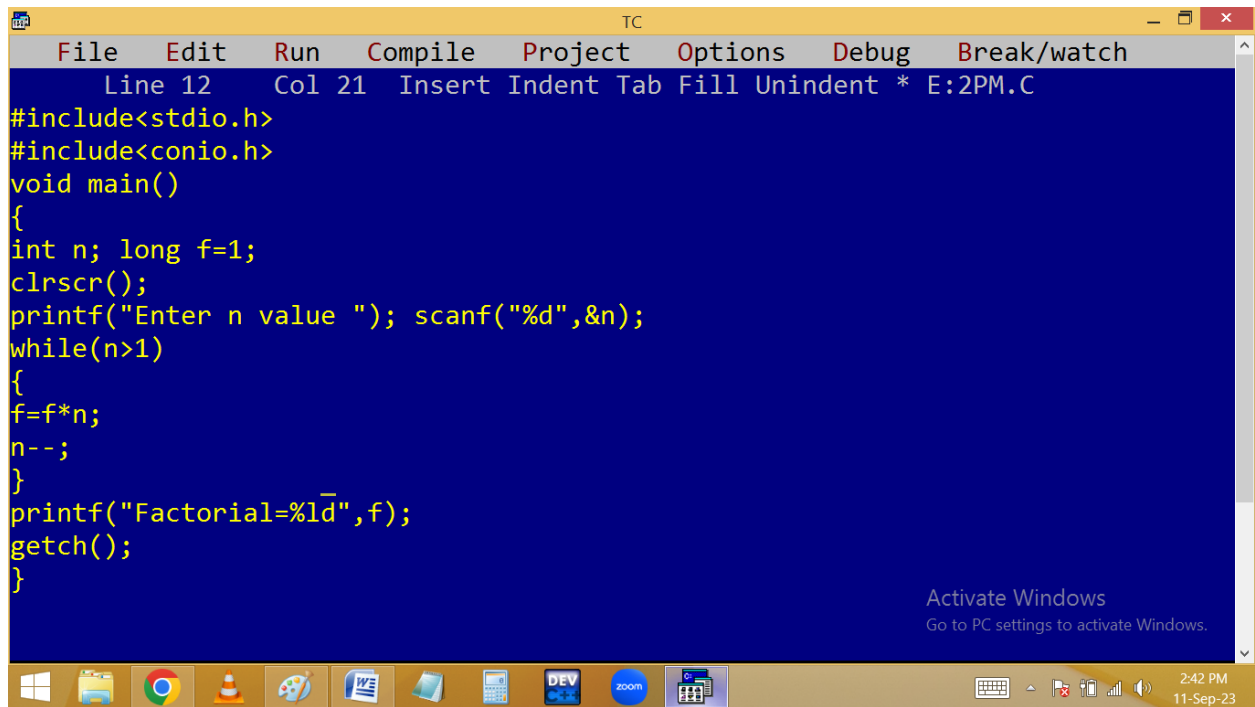
```
TC
Enter n value 5
Even Sum=6, Odd sum=9_

Activate Windows
Go to PC settings to activate Windows.

2:37 PM
11-Sep-23
```



Finding factorial:



The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". Below the menu bar, the status bar shows "Line 12", "Col 21", and "Insert Indent Tab Fill Unindent * E:2PM.C". The main editing area has a dark blue background with yellow text. The code is as follows:

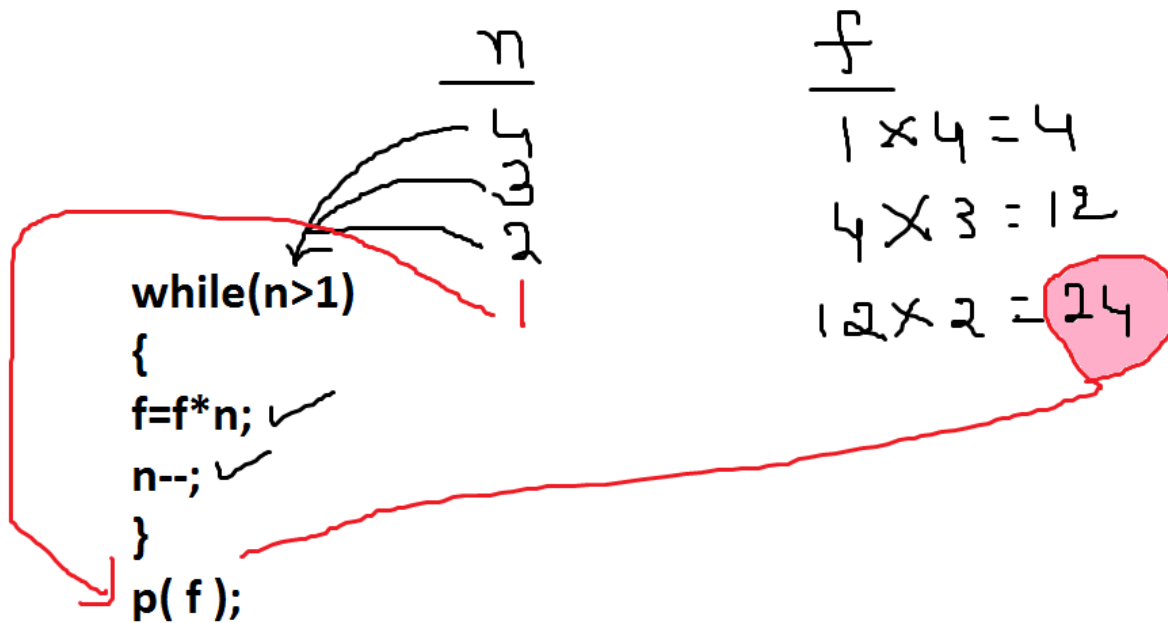
```
#include<stdio.h>
#include<conio.h>
void main()
{
int n; long f=1;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(n>1)
{
f=f*n;
n--;
}
printf("Factorial=%ld",f);
getch();
}
```

In the bottom right corner of the editing area, there is a watermark that says "Activate Windows" and "Go to PC settings to activate Windows." The Windows taskbar is visible at the bottom, showing icons for the Start menu, File Explorer, Google Chrome, VLC media player, Microsoft Word, a folder, a calculator, a "DEV" icon, Zoom, and a task view icon. The system tray on the right shows the date and time as "2:42 PM 11-Sep-23".

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

Activate Windows
Go to PC settings to activate Windows.

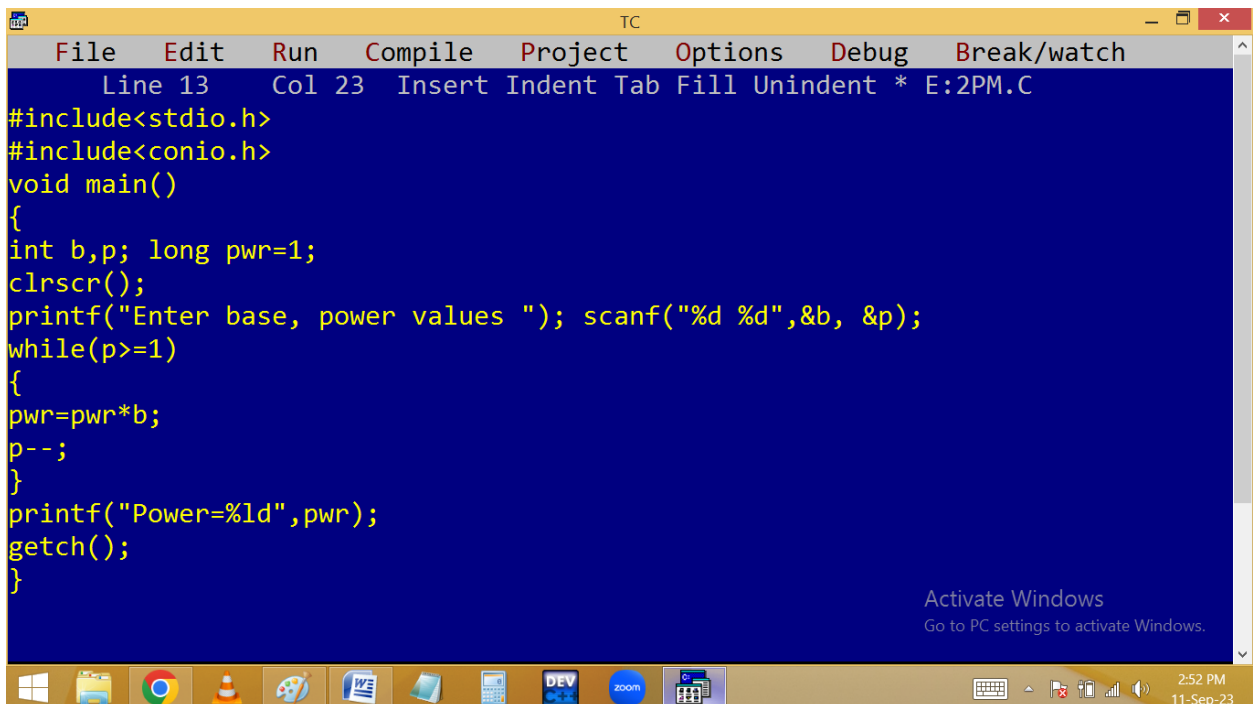
2:43 PM
11-Sep-23



Finding power value using user def program:

$$2^3 = 8$$

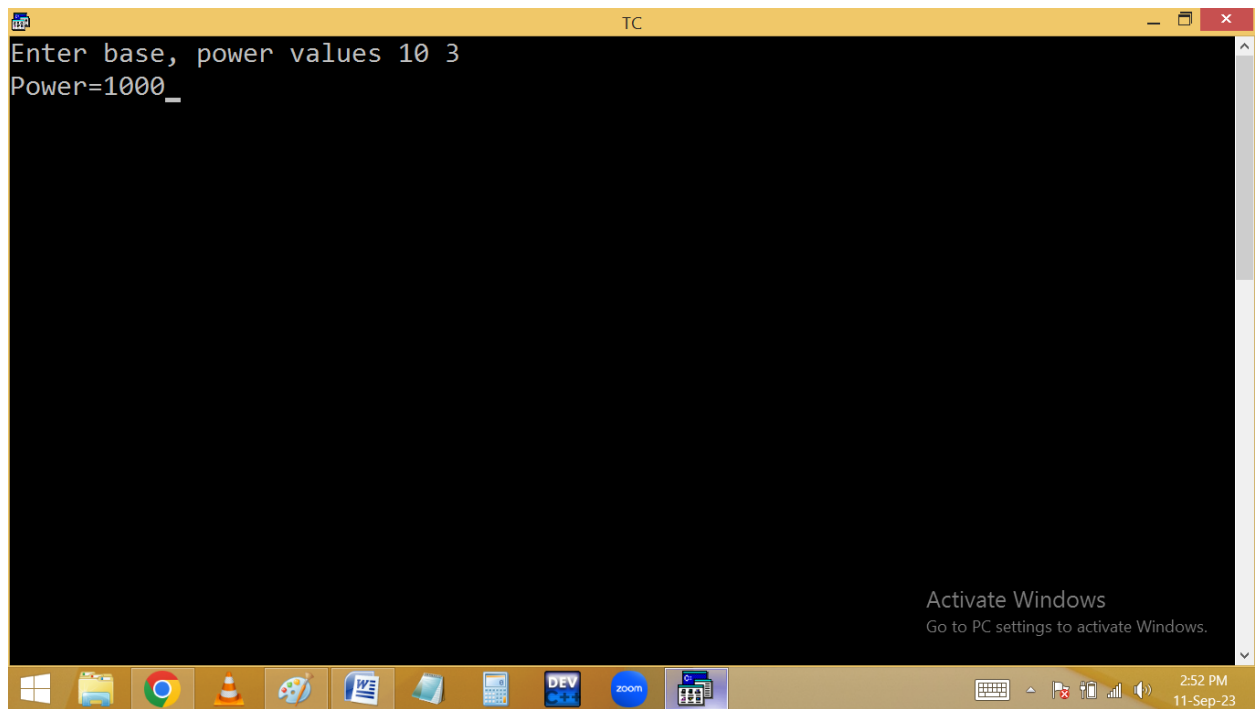
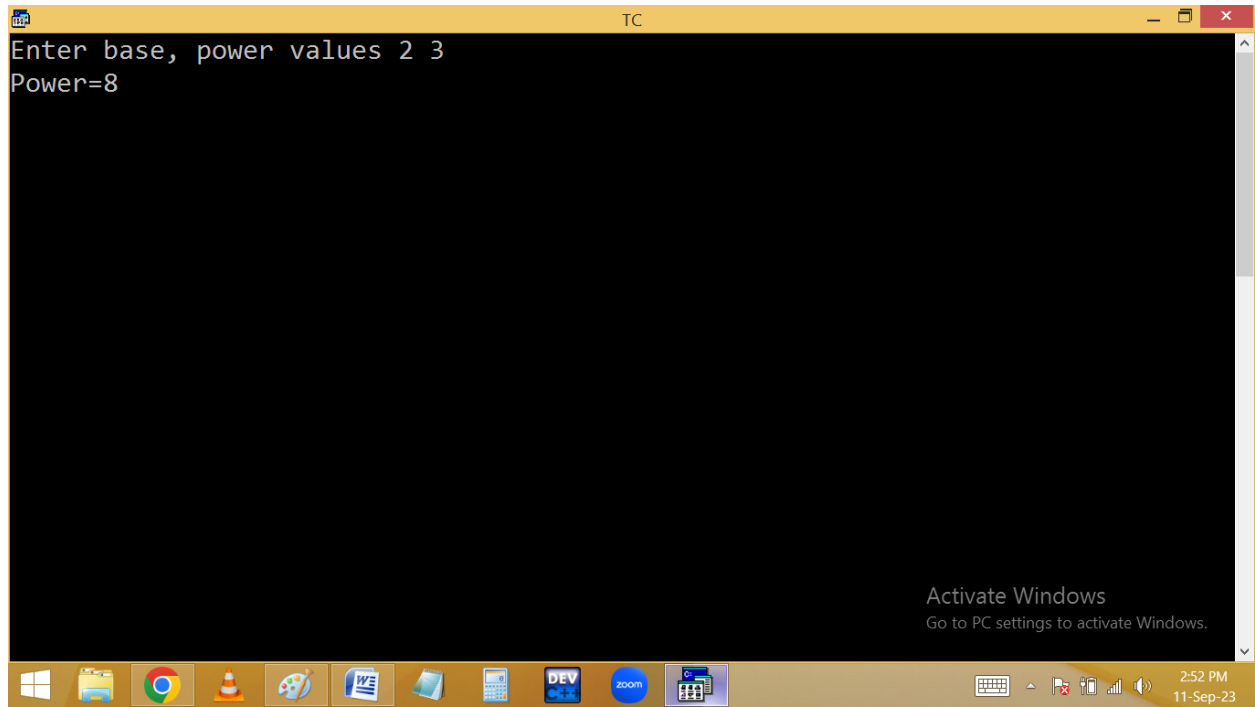
$$2 \times 2 \times 2 = 8$$



The screenshot shows a Turbo C++ (TC) IDE window. The title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the top indicates "Line 13", "Col 23", and "Insert Indent Tab Fill Unindent * E:2PM.C". The main editing area has a blue background and contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long pwr=1;
clrscr();
printf("Enter base, power values "); scanf("%d %d",&b, &p);
while(p>=1)
{
pwr=pwr*b;
p--;
}
printf("Power=%ld",pwr);
getch();
}
```

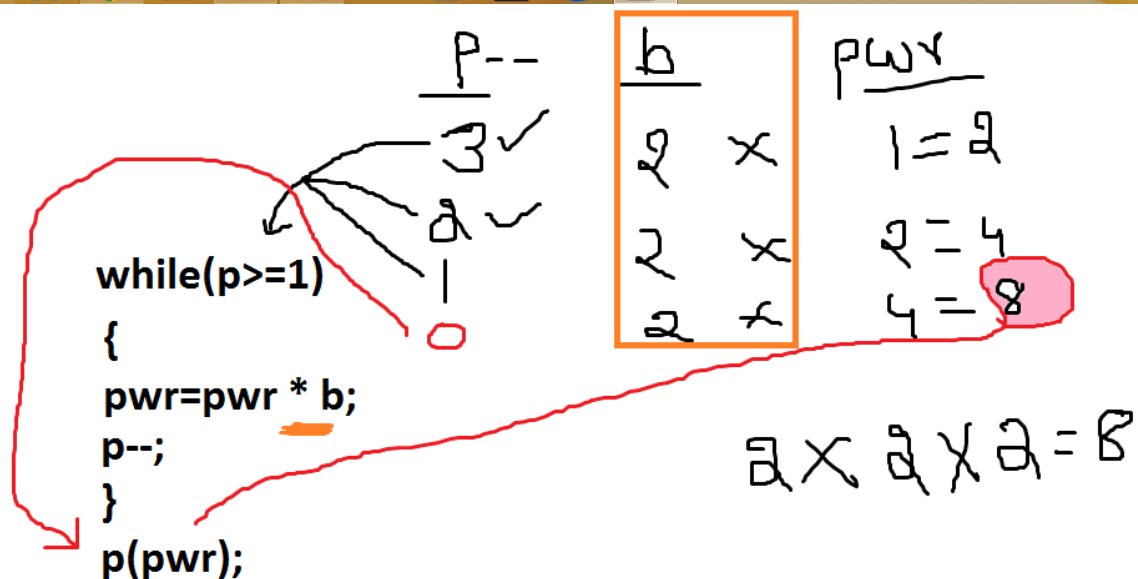
An "Activate Windows" watermark is visible in the bottom right corner of the code area, with the text "Go to PC settings to activate Windows." Below the code area, the Windows taskbar is visible, showing icons for the Start menu, File Explorer, Google Chrome, VLC media player, Paint, Word, a folder, a calculator, DEV C++, Zoom, and a task manager icon. The system tray on the right shows the date and time as "2:52 PM 11-Sep-23".



```
TC
Enter base, power values 1000 3
Power=1000000000

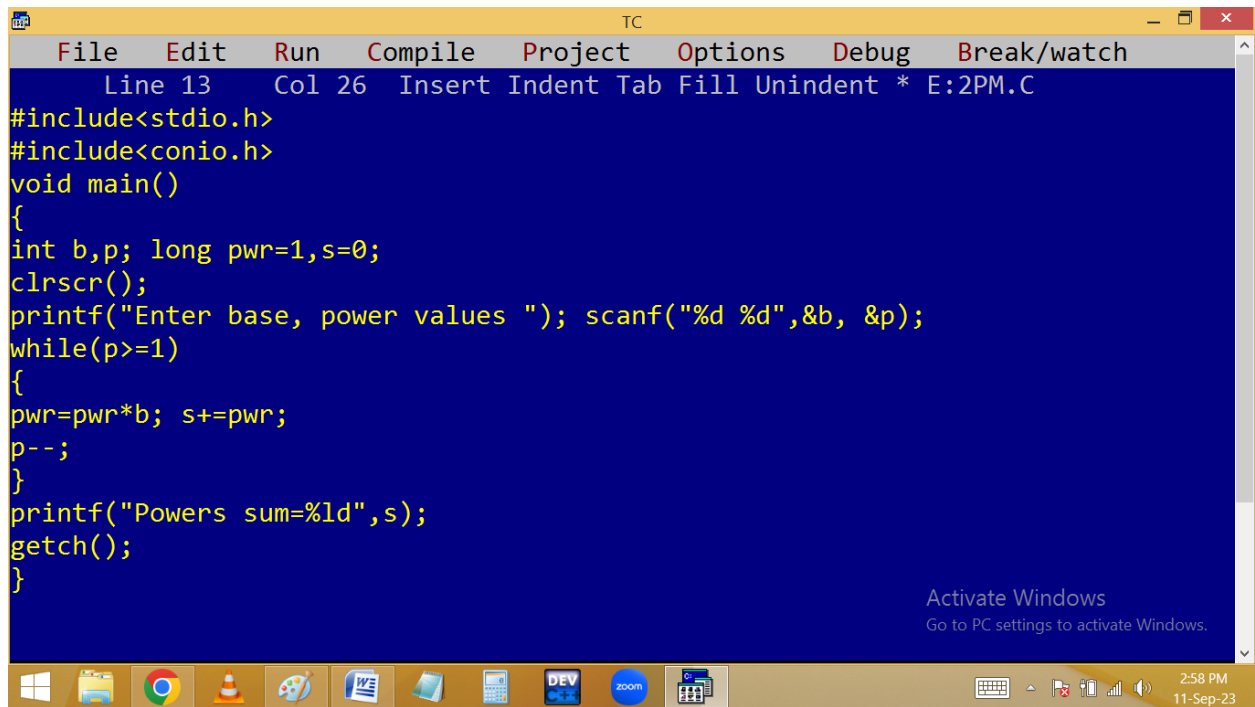
Activate Windows
Go to PC settings to activate Windows.

2:53 PM
11-Sep-23
```



Finding powers sum:

$$2^3 = 2^1 + 2^2 + 2^3 = 2 + 4 + 8 = 14$$



The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the top indicates "Line 13", "Col 26", and "Insert Indent Tab Fill Unindent * E:2PM.C". The main editing area has a blue background and contains the following C code:

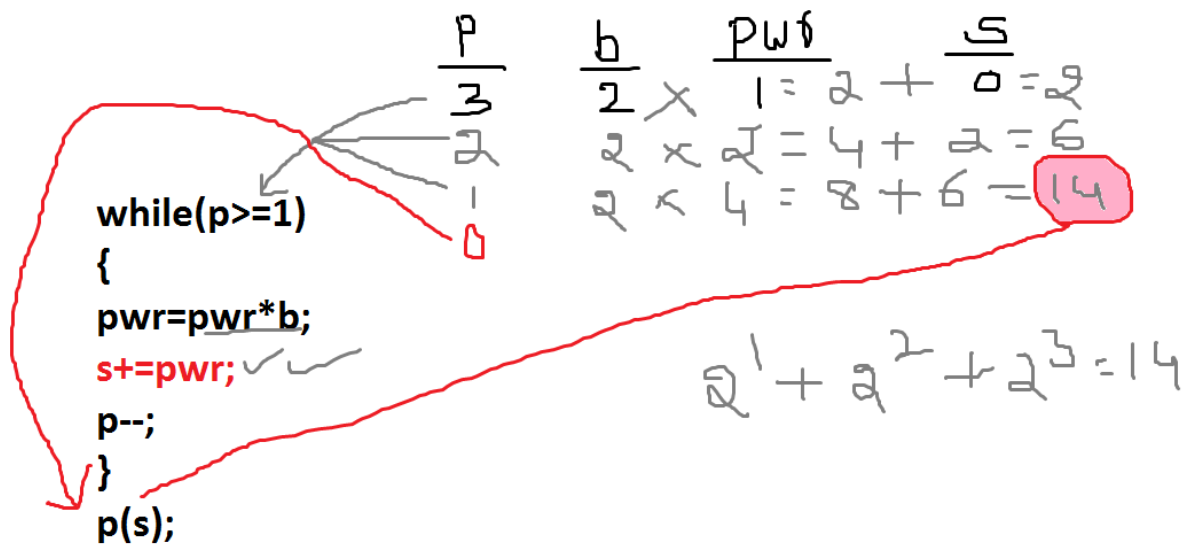
```
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long pwr=1,s=0;
clrscr();
printf("Enter base, power values "); scanf("%d %d",&b, &p);
while(p>=1)
{
pwr=pwr*b; s+=pwr;
p--;
}
printf("Powers sum=%ld",s);
getch();
}
```

An "Activate Windows" watermark is visible in the bottom right corner of the code area, with the text "Go to PC settings to activate Windows." Below the code area, the Windows taskbar is visible, showing icons for the Start menu, File Explorer, Google Chrome, VLC media player, Paint, Word, a folder, a calculator, a "DEV" icon, Zoom, and a task view icon. The system tray on the right shows the date and time as "2:58 PM 11-Sep-23".

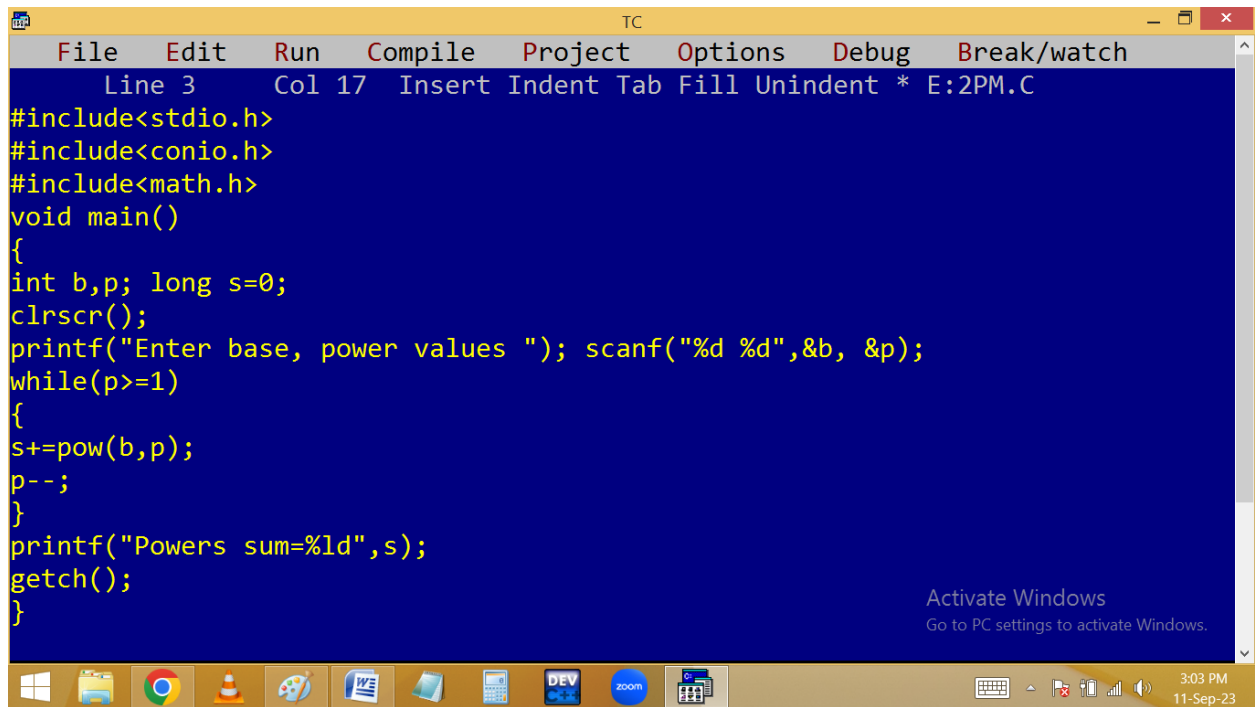
```
TC
Enter base, power values 2 3
Powers sum=14

Activate Windows
Go to PC settings to activate Windows.

3:02 PM
11-Sep-23
```



Using pow():



The image shows a screenshot of a Turbo C++ (TC) IDE window. The window has a yellow title bar with the text "TC" and standard Windows window controls. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the top indicates "Line 3", "Col 17", and "Insert Indent Tab Fill Unindent * E:2PM.C". The main editing area has a blue background and contains the following C code:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int b,p; long s=0;
clrscr();
printf("Enter base, power values "); scanf("%d %d",&b, &p);
while(p>=1)
{
s+=pow(b,p);
p--;
}
printf("Powers sum=%ld",s);
getch();
}
```

An "Activate Windows" watermark is visible in the bottom right corner of the code area, with the text "Go to PC settings to activate Windows." Below the code area is a Windows taskbar with various application icons, including the Start button, File Explorer, Google Chrome, VLC media player, Paint, Word, a folder, a calculator, a "DEV" icon, Zoom, and a task view icon. The system tray on the right shows the time as "3:03 PM" and the date as "11-Sep-23".

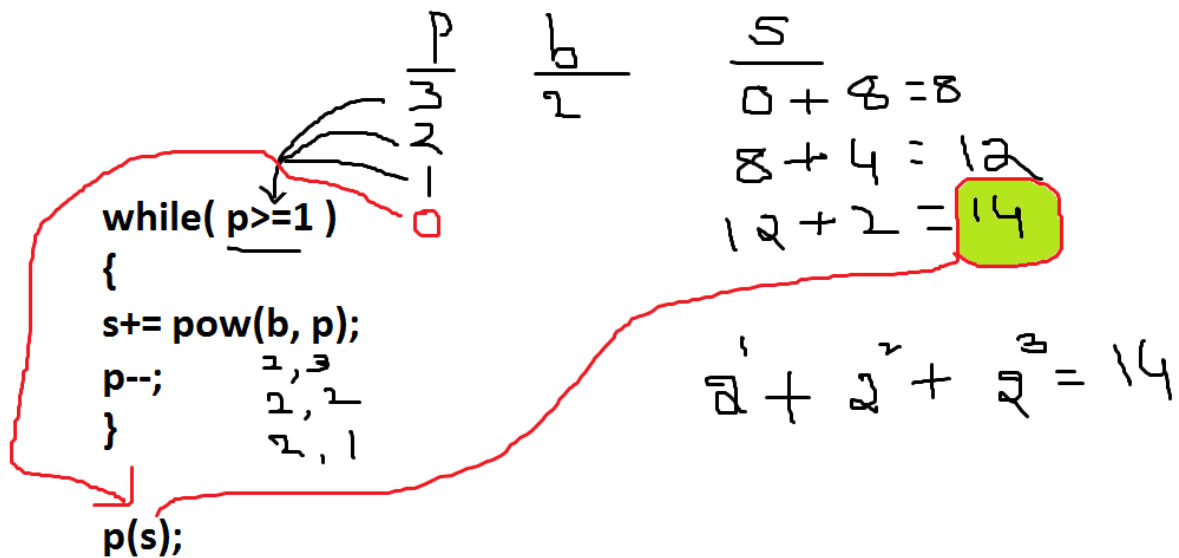
```

Enter base, power values 2 3
Powers sum=14_

```

Activate Windows
Go to PC settings to activate Windows.

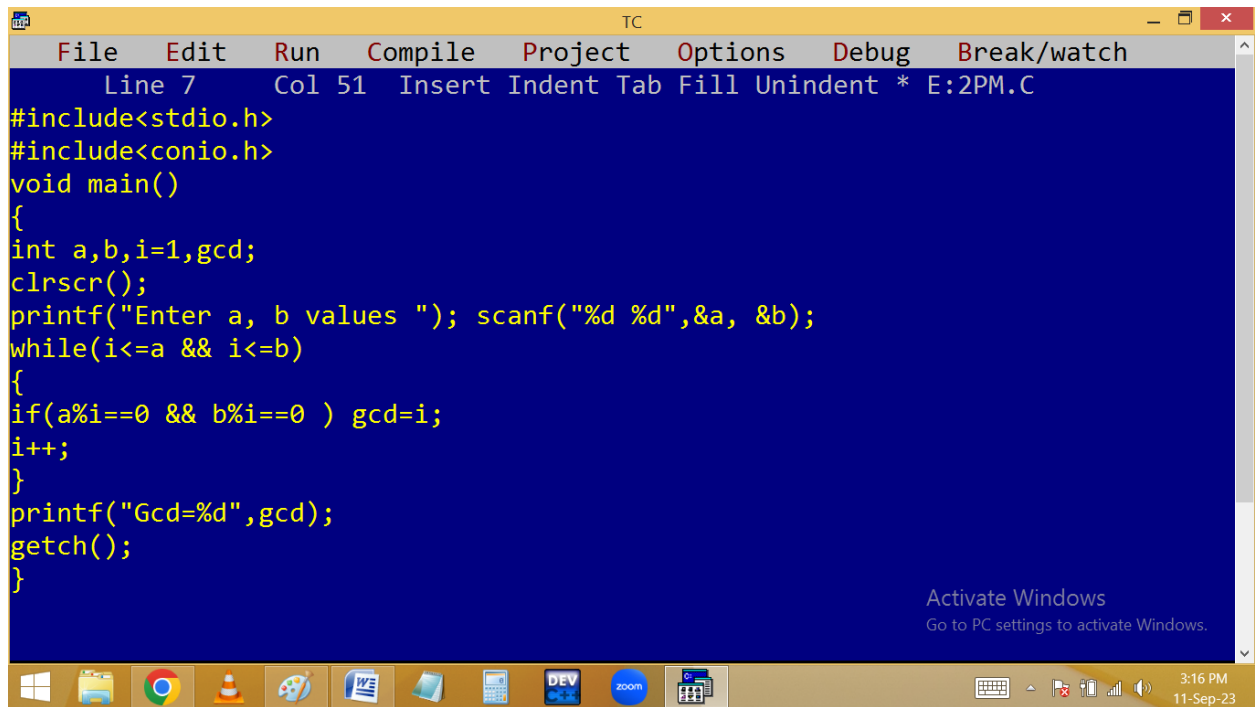
3:04 PM
11-Sep-23



Finding gcd / hcf of given two numbers.

4 divisible with 1, 2, 4

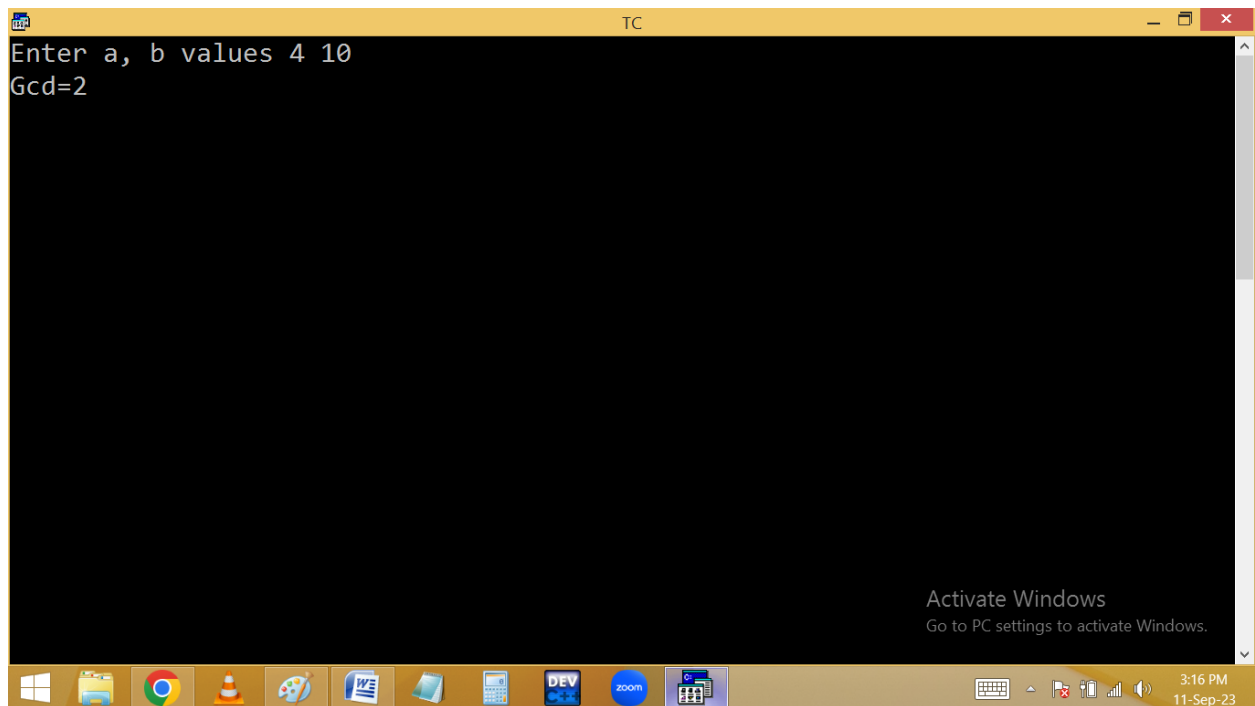
10 divisible with 1, 2, 5, 10



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 7, Col 51, Insert, Indent, Tab, Fill, Unindent, * E:2PM.C). The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,i=1,gcd;
    clrscr();
    printf("Enter a, b values "); scanf("%d %d",&a, &b);
    while(i<=a && i<=b)
    {
        if(a%i==0 && b%i==0 ) gcd=i;
        i++;
    }
    printf("Gcd=%d",gcd);
    getch();
}
```

An "Activate Windows" watermark is visible in the bottom right corner of the code editor.



The screenshot shows the Turbo C++ (TC) IDE after the program has been executed. The output window displays the following text:

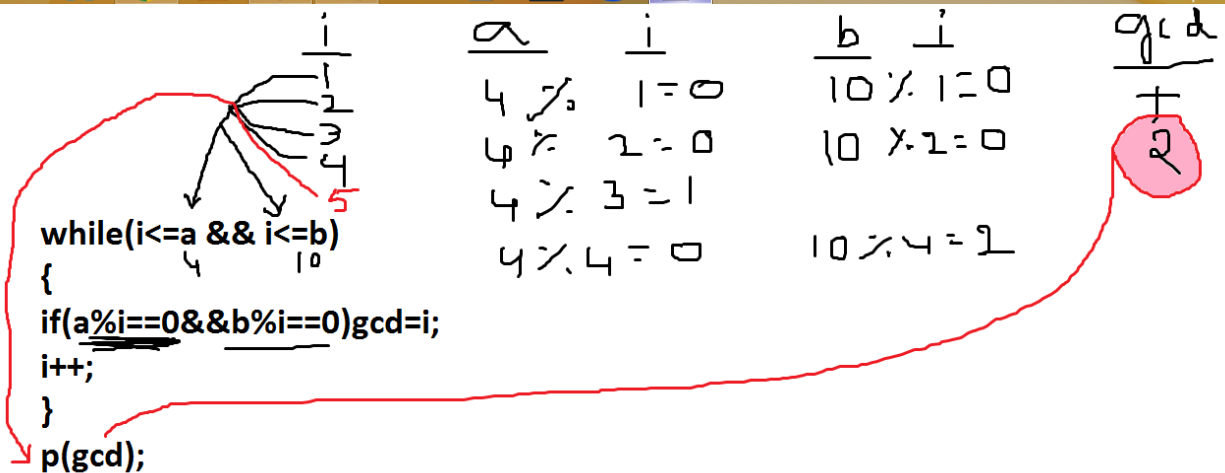
```
Enter a, b values 4 10
Gcd=2
```

An "Activate Windows" watermark is visible in the bottom right corner of the output window.

```
TC
Enter a, b values 30 40
Gcd=10
```

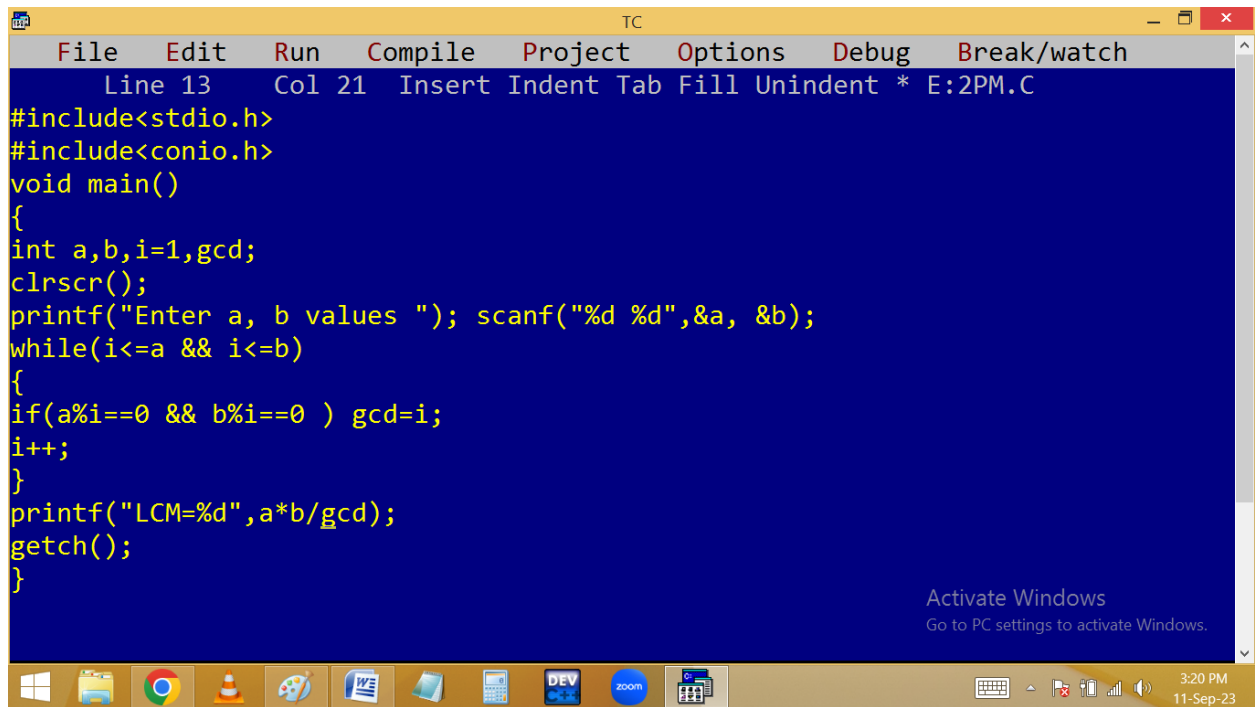
Activate Windows
Go to PC settings to activate Windows.

3:16 PM
11-Sep-23



Finding LCM of given two numbers:

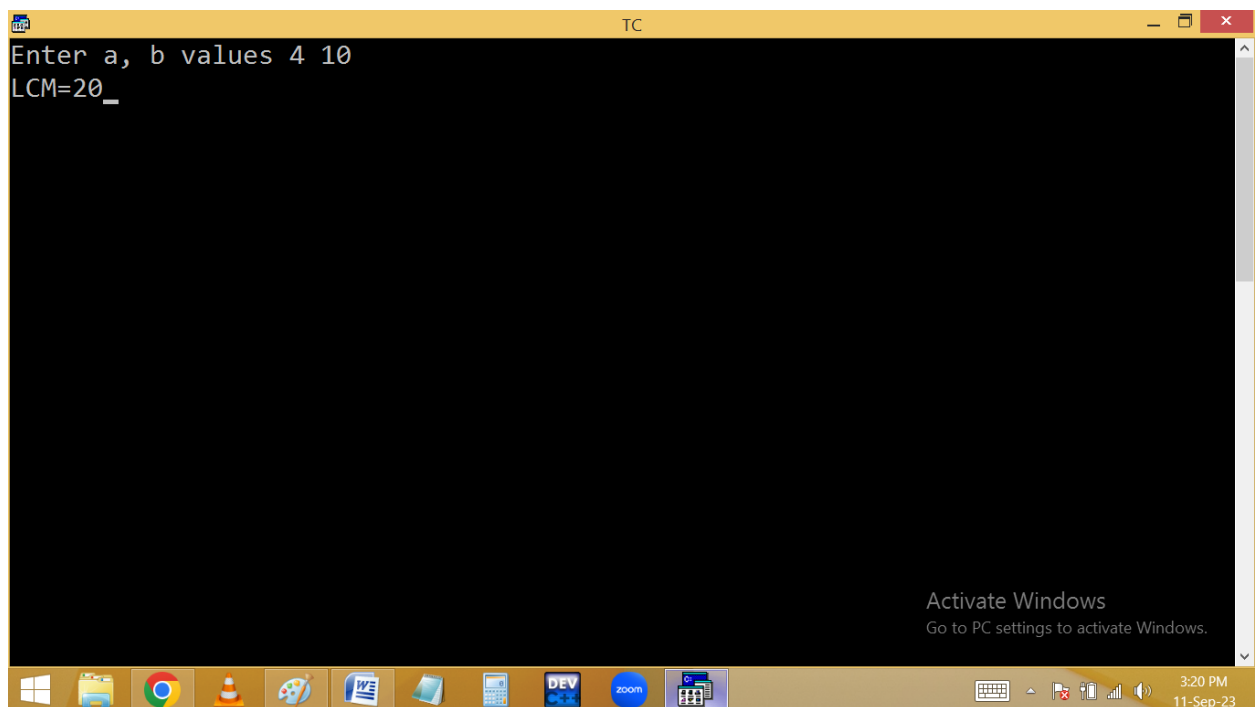
Using gcd:



```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 21 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,i=1,gcd;
clrscr();
printf("Enter a, b values "); scanf("%d %d",&a, &b);
while(i<=a && i<=b)
{
if(a%i==0 && b%i==0 ) gcd=i;
i++;
}
printf("LCM=%d",a*b/gcd);
getch();
}
```

Activate Windows
Go to PC settings to activate Windows.

3:20 PM
11-Sep-23



```
TC
Enter a, b values 4 10
LCM=20_
```

Activate Windows
Go to PC settings to activate Windows.

3:20 PM
11-Sep-23

```
TC
Enter a, b values 4 6
LCM=12_

Activate Windows
Go to PC settings to activate Windows.
```

$$\frac{a}{4} \times \frac{b}{10} = 40 / \frac{gcd}{2} = 20 \quad \text{LCM}$$

Without gcd:

$$\begin{array}{rcl}
 \text{max}++ & & 0 \\
 \hline
 6 \div 4 & = & 2 \\
 7 \div 4 & = & 3 \\
 8 \div 4 & = & 0 \\
 9 \div 4 & = & 1 \\
 10 \div 4 & = & 2 \\
 11 \div 4 & = & 3 \\
 12 \div 4 & = & 0
 \end{array}$$

$$\begin{array}{rcl}
 \text{max} & & 0 \\
 \hline
 6 & & 6 \\
 8 \div 6 & = & 2 \\
 12 \div 6 & = & 0
 \end{array}$$

12 is lcm for 4 & 6

```

TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 1 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,max,gcd;
clrscr();
printf("Enter a, b values "); scanf("%d %d",&a, &b); max=a>b?a:b;
while(max)
{
if(max%a==0 && max%b==0 ) {printf("LCM=%d",max);break; }
max++;
}
getch();
}

```

Activate Windows
Go to PC settings to activate Windows.

3:34 PM
11-Sep-23

$\text{max} = a > b ? a : b; \implies \text{max} = 4 > 6 ? 4 : 6 \implies \text{max} = 6$

```
while(max)
{
    if(max%a==0&&max%b==0)
    {p("Lcm=max");break;}
    max++; ✓
}
```

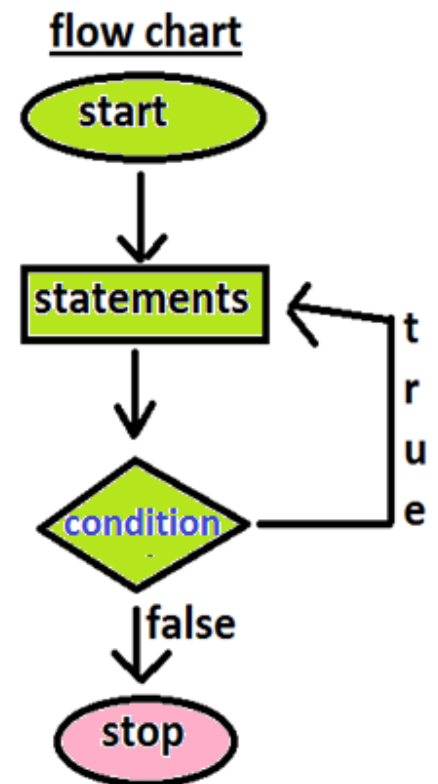
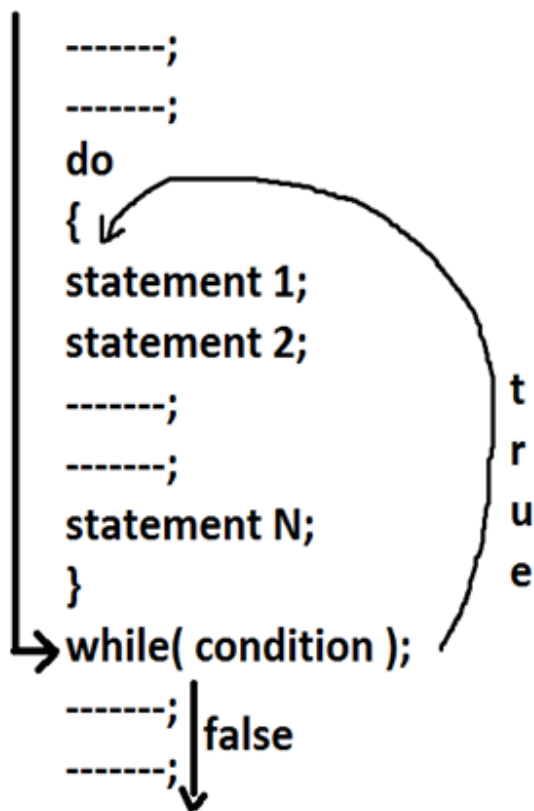
<u>max</u>	<u>a</u>	<u>max</u>	<u>b</u>
6	✓	6	6
7	✗	4 = 2	
8	✗	4 = 2	8 ✗ 6 = 2
9		4 = 0	
10			
11			
✓ 12	✓ 4 = 0	12	✓ 6 = 0

do..while:

- It is an exit control loop. i.e. in a do while the condition is tested at last.
- Here do , while are the keywords.

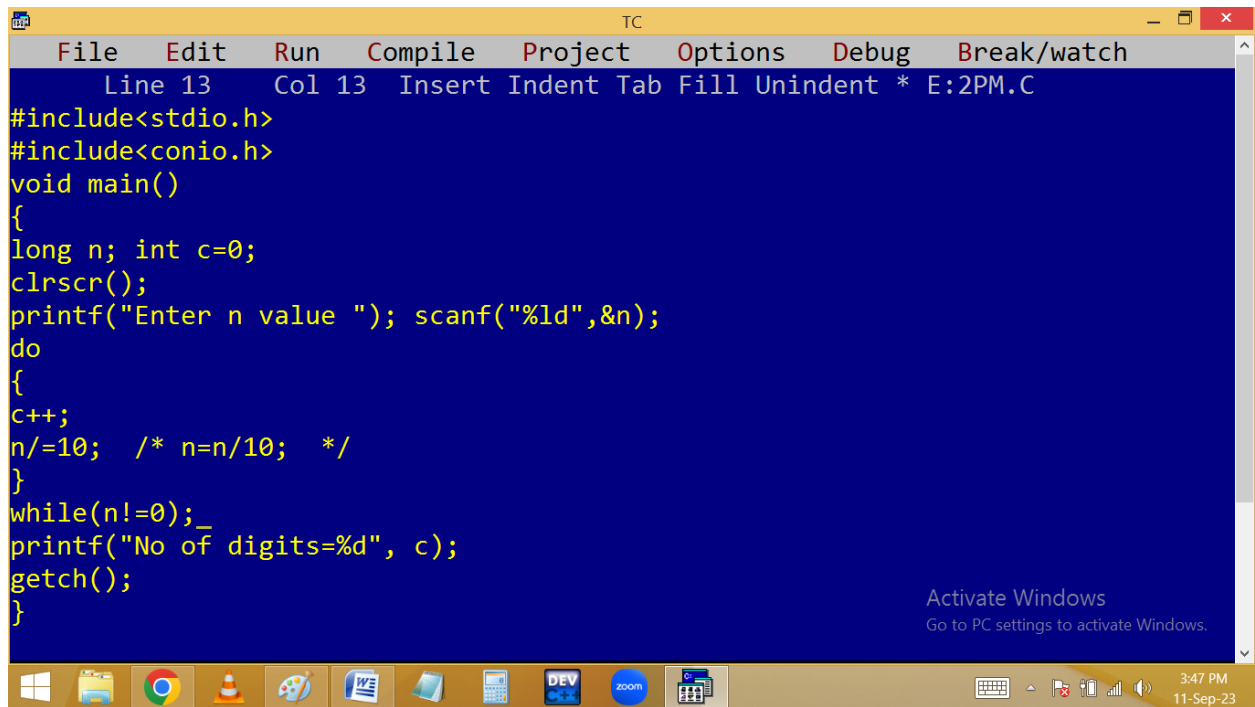
- It is also used to repeat a program several times based on a condition.
- In a do while, do block statements are executed first and later while condition is tested. If the while condition is true then once again the do block statements are repeated. Like this the process is continued until the while condition becomes false.
- In do while, the while should be end with semicolon (;) .
- Regardless of while condition, the do statements are executed at least one time. Due to this sometimes we are getting unwanted results [garbage values].

- Use do while whenever it is compulsory because of in do while the program is controlled at the bottom / last.



Finding no of digits in given no.

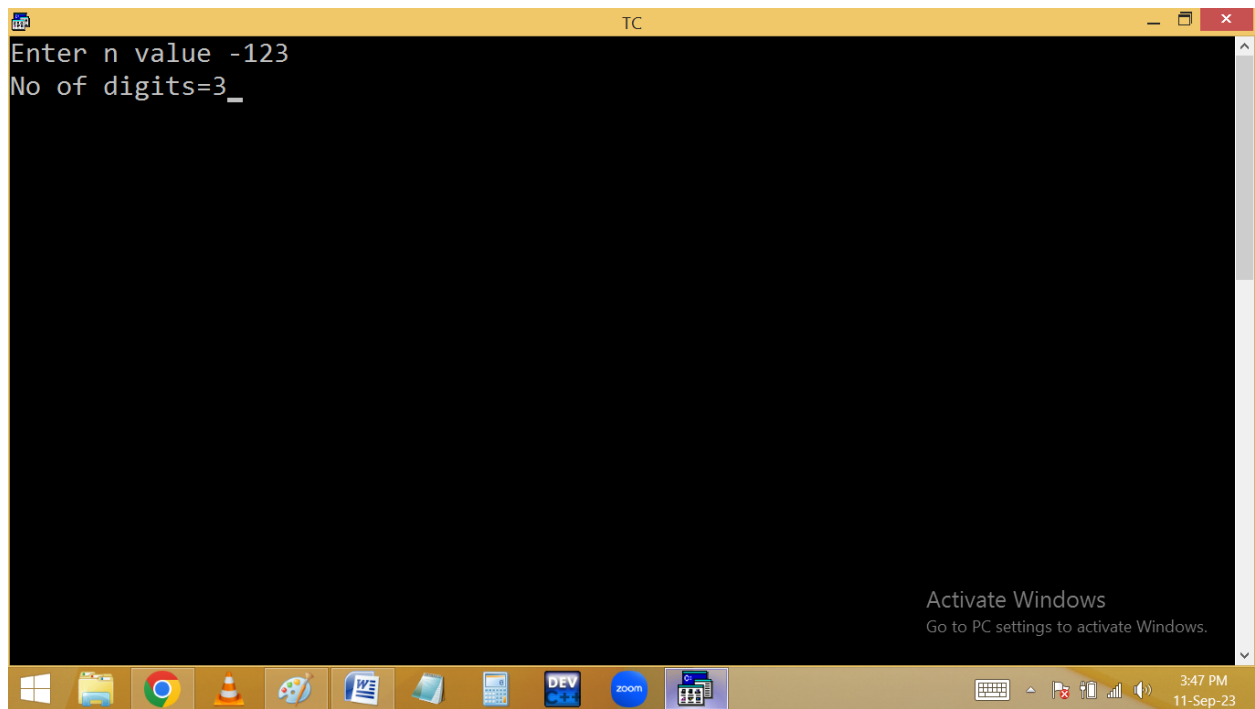
Eg: 1023 → 4 digits no



```
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 13 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int c=0;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
do
{
c++;
n/=10; /* n=n/10; */
}
while(n!=0);_
printf("No of digits=%d", c);
getch();
}
```

Activate Windows
Go to PC settings to activate Windows.

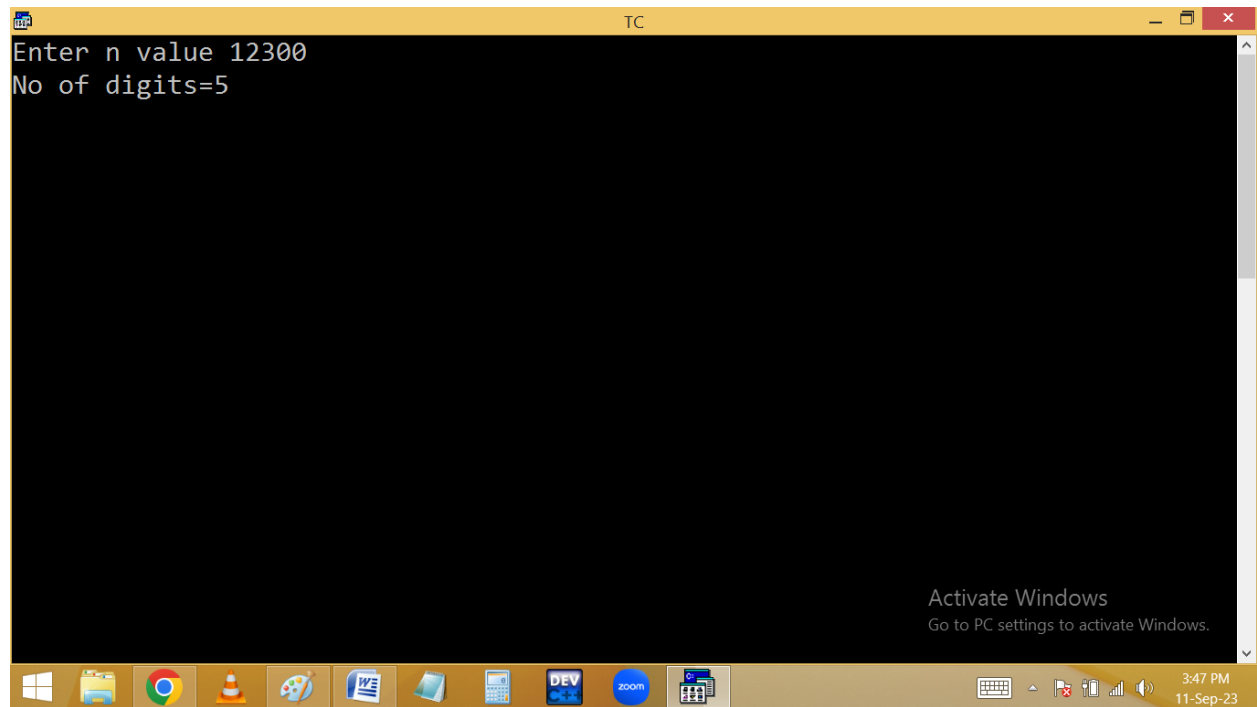
3:47 PM
11-Sep-23

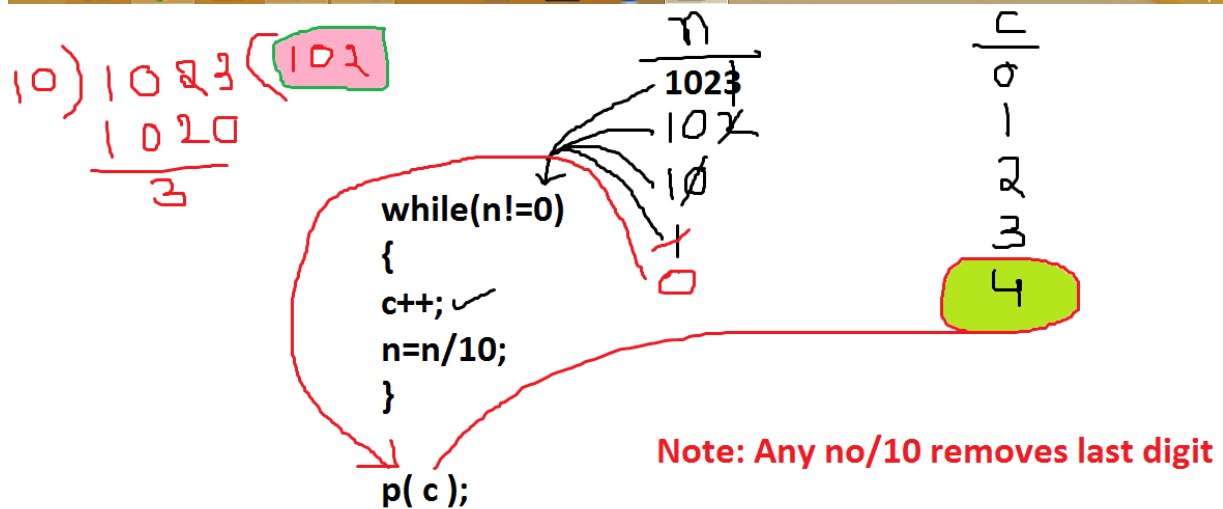
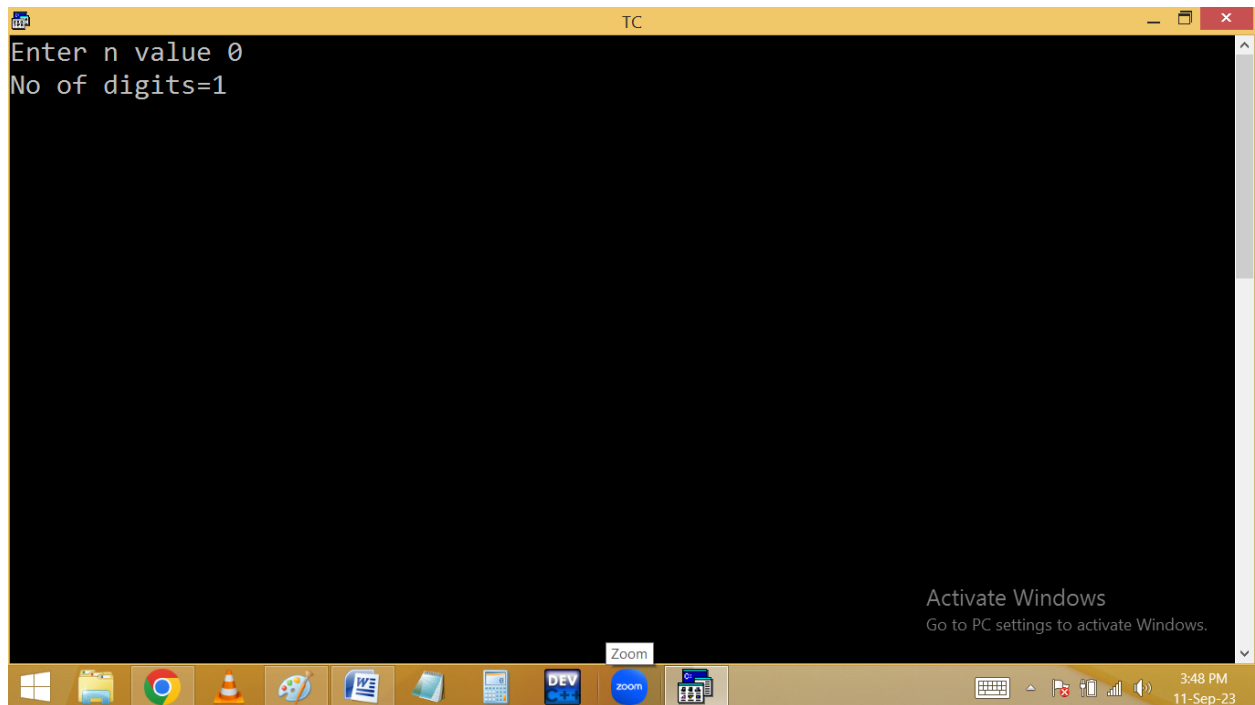


```
Enter n value -123
No of digits=3_

Activate Windows
Go to PC settings to activate Windows.

3:47 PM
11-Sep-23
```





Home work: Without using loop: